

Research on the Teaching Reform of Cost Accounting Course Based on Big Data and Artificial Intelligence

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Abstract: With the rapid development of big data and artificial intelligence technologies, the traditional teaching mode of cost accounting course is facing many challenges. This paper deeply analyzes the existing problems in the current teaching of cost accounting course, explores the application value of big data and artificial intelligence in cost accounting teaching, and proposes teaching reform strategies for cost accounting course based on these two technologies. The aim is to improve teaching quality and cultivate cost accounting talents who meet the needs of the times.

Keywords: Big Data; Artificial Intelligence; Cost Accounting Course

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1. Introduction

With the advent of the digital economy era, big data and artificial intelligence technologies have deeply penetrated into various fields of social economy. In enterprise operations, these technologies have not only changed the way of data processing and analysis but also reshaped the cost management model of enterprises. Through the rapid processing and intelligent analysis of massive data, enterprises can achieve accurate cost prediction, dynamic monitoring, and optimal decision-making, thereby enhancing their competitiveness. In this context, cost management has become a key link in the digital transformation of enterprises, and the requirements for cost accounting talents have also undergone great changes.

However, the current teaching of cost accounting course in universities still mainly adopts the traditional mode. The teaching content focuses on theoretical knowledge and basic accounting methods, and the teaching methods mostly rely on lectures. There are few practical links, and there is a lack of connection with actual work scenarios ^[1]. Students trained under this teaching mode often find it difficult to meet the needs of digital cost management in enterprises and have obvious deficiencies in data processing, intelligent analysis, and other aspects. Therefore, the contradiction between the traditional teaching mode of cost accounting course and the development needs of the times has become

increasingly prominent, and reform is urgently needed.

This paper aims to explore an effective path to integrate big data and artificial intelligence technologies into the teaching of a cost accounting course. By optimizing the curriculum content, innovating teaching methods, strengthening practical teaching, and other means, it aims to construct a cost accounting course teaching system that meets the needs of the times.

2. Problems existing in the current teaching of cost accounting course

2.1. Lagging teaching content

In terms of content arrangement, the existing cost accounting textbooks still take traditional cost accounting methods and cost analysis and control theories as the core. They mostly focus on basic accounting models such as the job costing method, batch costing method, and process costing method. The introduction of modern cost management methods like activity-based costing is relatively brief, and even in many courses, due to time constraints, the accounting of activity-based costing cannot be covered. The update cycle of textbooks is long, and the innovative applications of big data and artificial intelligence technologies in the field of cost management have not been incorporated in a timely manner.

This lag in content has caused a serious disconnection between the knowledge learned by students and the actual needs of enterprises. When students enter the workplace and face the cost management systems constructed by enterprises based on big data platforms and the work scenarios of using machine learning algorithms for cost analysis, they often feel at a loss and find it difficult to effectively apply the knowledge learned in class to their actual work. The disconnection between the teaching content and the development of the industry not only affects students' professional competitiveness but also restricts the supporting role of cost accounting education in the industry's development.

2.2. Single teaching method

The traditional teaching mode is dominated by teachers' lectures. In class, teachers impart knowledge, and students passively accept it, lacking effective interaction between teachers and students. During the teaching process, teachers mostly adopt the "cramming" teaching method, focusing on the instillation of theoretical knowledge. They demonstrate cost accounting formulas and analysis processes through blackboard writing or slides, and students mechanically record and memorize ^[2,3]. They have very few opportunities to participate in classroom discussions and express their personal opinions, making it difficult to mobilize their learning enthusiasm and resulting in a dull classroom atmosphere.

At the same time, the practical teaching links are seriously insufficient. Many universities do not have corresponding practical courses. Even if there are, they mostly use traditional paper-based simulated account books as the carrier and set up simple cost accounting cases, lacking a deep integration with the actual business scenarios of enterprises. It is difficult for students to experience the cost management workflow in the environment of big data and artificial intelligence ^[4]. This teaching method is difficult to stimulate students' learning interest and initiative. Students cannot fully exercise their practical abilities, such as data processing and intelligent analysis, during the learning process, and it is even more difficult to cultivate innovative thinking. Against the backdrop of the widespread application of intelligent financial systems in enterprises for cost management ^[5], the single teaching method makes it difficult for students to meet the digital and intelligent work requirements, restricting the improvement of students' professional development potential and comprehensive qualities.

2.3. Weak practical teaching links

In the practical teaching process, it still mainly relies on traditional manual simulated account books and basic financial software operations. Manual simulation training is mostly limited to basic accounting processes such as voucher filling, account book registration, and statement preparation. Although it can help students master the basic operation logic of cost accounting, it is seriously disconnected from the real business scenarios of enterprises and is difficult to reflect the application value of big data and artificial intelligence technologies in cost management.

In terms of the application of financial software, most colleges and universities only require students to operate the basic accounting modules and rarely involve high-level financial systems with functions such as data analysis and intelligent decision-making. Even when practical teaching is introduced, it mostly stays at the simple entry and preliminary calculation of cost data, lacking the design of practical links such as data collection, cleaning, and analysis on big data platforms, as well as using artificial intelligence algorithms for cost prediction and optimization decision-making [6]. Under this teaching mode, students cannot get in touch with the big data analysis tools and artificial intelligence models applied by enterprises and have difficulty forming an intuitive understanding of the intelligent cost management workflow. When students enter the workplace and face the cost management systems built by enterprises based on big data and artificial intelligence, due to the lack of relevant practical experience, they are difficult to quickly adapt to the job requirements and cannot meet the practical ability requirements of enterprises for cost accounting talents in terms of data processing, intelligent analysis, and decision support.

2.4. Imperfect assessment and evaluation system

Currently, most assessments mainly adopt closed-book exams, and the question types revolve around theoretical knowledge and formula applications. They focus on examining students' memory and repetition of cost accounting methods and cost analysis theories, or simply conduct calculations and analyses according to the scenarios given in the book, usually accounting for more than 70% of the total score. This evaluation method simplifies the learning process into knowledge memorization and ignores students' performance in practical abilities such as big data processing and intelligent analysis, as well as innovative thinking.

The assessment of practical links also becomes a mere formality. The scoring criteria for manual simulation experiments and basic financial software operations are single, mostly centered around the accuracy of data calculation results, lacking the evaluation of students' abilities to solve practical problems using big data tools and propose innovative cost management solutions. Such a one-sided assessment and evaluation system cannot comprehensively measure students' learning achievements, is difficult to guide students to attach importance to the cultivation of practical skills and innovative abilities, and is even more unable to select professional talents who truly meet the needs of digital cost management for enterprises.

3. The application value of Big Data and Artificial Intelligence in Cost Accounting teaching

3.1. Enriching teaching content

With the help of the big data platform, teachers can obtain a vast amount of real corporate cost data and typical cases.

For example, manufacturing enterprises optimize supply chain costs through artificial intelligence algorithms, and e-commerce platforms use big data to analyze user behavior and precisely control marketing costs. Integrating these vivid materials into teaching can replace the traditional single theoretical model. At the same time, artificial intelligence technology can dynamically generate diverse cost simulation scenarios, simulating the cost management decisions of enterprises under different operating conditions. This enables students to be exposed to cutting-edge practical content such as cost prediction and intelligent analysis, making the teaching content closely conform to the actual digital operation of enterprises, and significantly enhancing the practicality and pertinence of teaching.

3.2. Innovating teaching methods

By analyzing students' learning behavior data through big data, teachers can accurately grasp each student's knowledge weaknesses and learning preferences, and realize the importance of personalized teaching plans to meet differentiated learning needs. The intelligent tutoring system supported by artificial intelligence algorithms can answer students' questions in real time and provide targeted guidance according to the types of questions, enhancing students' learning autonomy. Meanwhile, virtual simulation experiments use artificial intelligence to construct a cost management simulation environment that highly restores the actual enterprise scenarios. Students can operate big data analysis tools in the virtual space and use intelligent algorithms for cost prediction and decision-making, experiencing the digital cost management process firsthand, which greatly improves the teaching effect and students' learning immersion [7].

3.3. Strengthening practical teaching

By building an intelligent platform that simulates the real operation environment of enterprises, students can participate in the entire process of cost management work. From using big data tools to collect multi-dimensional cost data, to processing information with the help of data cleaning and mining technologies, and then conducting in-depth analysis of cost data through artificial intelligence algorithms, and finally completing cost prediction and optimization decisions based on the analysis results. This process enables students to get rid of the limitations of traditional manual simulation. In the digital and intelligent practical scenarios, students can effectively improve their data processing, intelligent analysis, and practical problem-solving abilities, achieve a deep integration of theoretical knowledge and practical operations, and effectively narrow the gap between classroom learning and actual enterprise work.

3.4. Improving the assessment and evaluation system

With the help of big data technology, it is possible to comprehensively record students' learning behavior data in various links such as classroom interaction, case analysis, and virtual simulation experiments, including participation, operation duration, data processing accuracy, etc. By conducting an in-depth analysis of these data in combination with artificial intelligence algorithms, an intelligent evaluation report covering multiple dimensions such as theoretical knowledge mastery, practical operation ability, and innovative thinking can be generated. This intelligent evaluation method breaks through the limitations of traditional assessment. It can not only more comprehensively and objectively reflect students' learning effects but also, through the analysis of evaluation results, accurately locate the weak links in teaching, providing strong data support for subsequent adjustments of teaching content and optimization of teaching methods, and promoting the continuous improvement of the teaching quality of cost accounting.

4. Teaching reform strategies for Cost Accounting course based on Big Data and Artificial Intelligence

4.1. Teaching content reform

In terms of updating the textbook content, it is necessary to break through the knowledge framework of traditional textbooks and systematically incorporate the application of cutting-edge technologies such as big data collection and preprocessing, artificial intelligence cost prediction models, and intelligent cost analysis systems into the textbook system. Not only should the technical principles be elaborated in detail, but also combined with typical enterprise cases, such as Haier Group using big data to optimize supply chain costs and Huawei using artificial intelligence to achieve dynamic control of R&D costs, to analyze the specific implementation paths of these technologies. At the same time, add highly practical chapters, design cost accounting processes based on big data analysis platforms, and provide experimental guidance on using tools like Python for cost data mining, enabling students to intuitively experience the work scenarios of digital cost management.

In terms of expanding teaching resources, efforts should be made to construct an open cost accounting teaching resource library. On the one hand, widely collect cost management practice cases of well-known domestic and foreign enterprises, covering multiple fields such as manufacturing, the Internet, and finance, to form a matrix of case resources. On the other hand, integrate high-quality cost accounting data sets, such as the publicly available financial data of listed companies and industry cost benchmark databases, and introduce mainstream data analysis software tools like Power BI and Tableau, as well as operation guides for intelligent financial robots. Open these resources to students through an online platform to assist students in independent exploratory learning, making the teaching resources truly a bridge connecting the classroom and the workplace.

4.2. Teaching method reform

- (1) Introduce data analysis software such as Tableau and Power BI, and visualization tools like Python in teaching. Guide students to use technologies such as data cleaning, modeling, and visualization to mine and analyze enterprise cost data, transforming abstract cost theories into practical skills that can be applied. This helps students intuitively present the trends of cost changes and improve their data insight ability.
- (2) Develop an intelligent tutoring system using artificial intelligence algorithms. According to students' learning progress, knowledge mastery level, and weak links, it can dynamically generate personalized learning plans [8]. For example, for students who have difficulty understanding the cost prediction model, the system automatically pushes resources such as intensive exercises and micro-lecture videos, and answers questions in real time, achieving "one-to-one" intelligent tutoring and breaking through the limitations of traditional teaching in terms of time and space.
- (3) Implement project-based learning. Design comprehensive project tasks around actual cost management issues of enterprises, such as the optimization of production costs of a manufacturing enterprise and the control of marketing costs of an e-commerce platform. Students work in groups and simulate the real business scenarios of enterprises throughout the process, from data collection and analysis to the formulation of cost optimization strategies. In the process of solving practical problems, they not only exercise their team collaboration ability but also improve their practical ability to handle complex cost problems using big data and artificial intelligence technologies.

4.3. Practical teaching reform

- (1) Build a virtual simulation laboratory and use big data and artificial intelligence technologies to set up an immersive cost accounting experimental platform, simulating the entire process of enterprises from cost data collection, intelligent analysis, to decision-making optimization. Students can operate intelligent financial systems in a virtual environment, use big data analysis tools to process complex cost data, and accumulate practical experience in highly restored enterprise scenarios.
- (2) Deepen school-enterprise cooperation in practice. Establish internship bases in cooperation with enterprises to create opportunities for students to participate in real cost management work ^[9]. Students go deep into the front line of enterprises, learn their cost management models and application methods of digital tools, and use the knowledge learned in class to solve problems such as cost accounting and budget control in actual projects, achieving a deep integration of theory and practice. This effectively improves their practical operation and practical problem-solving abilities and meets the needs of enterprises for high-quality cost accounting talents.

4.4. Reform of the assessment and evaluation system

In terms of diversified assessment methods, abandon the single summative examination mode and organically combine formative assessment with summative assessment. In formative assessment, add links such as practical operations ^[10], project reports, and group discussions. Practical operations focus on examining students' ability to use big data tools to process cost data, project reports evaluate students' ability to analyze and solve complex cost problems, and group discussions test their team collaboration and innovative thinking, comprehensively covering students' knowledge mastery, practical application, and comprehensive qualities.

Develop an intelligent evaluation system with the help of big data and artificial intelligence algorithms. By collecting students' learning behavior data, such as classroom interaction, assignment completion, and experimental operation in real time, and using machine learning algorithms for in-depth analysis, a multi-dimensional evaluation model is constructed. The system can not only quantitatively evaluate students' knowledge mastery level and practical skill level but also generate personalized evaluation reports, accurately pointing out students' strengths and weaknesses in each link of cost management and providing targeted learning improvement suggestions. At the same time, the intelligent evaluation system can also help teachers dynamically adjust teaching strategies, continuously optimize the teaching process, and effectively improve teaching quality.

Disclosure statement

The author declares no conflict of interest.

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