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Research on Innovative Pathways for Cultivating Talents in the Business Administration Major of Undergraduate Colleges and Universities Empowered by Artificial Intelligence

Qunping Chen
School of Business, Lingnan Normal University, Zhanjiang 524048, Guangdong, China

Abstract

The rapid development of artificial intelligence (AI) technology is profoundly transforming the landscape of talent cultivation in the Business Administration major at undergraduate colleges and universities. This transformation commences with a reorientation of talent cultivation objectives, encompassing the construction of a composite knowledge system integrating "AI + Business Administration," the cultivation of practical capabilities in intelligent management, and the shaping of professional qualities suited for the intelligent era, thereby forming a comprehensive cultivation orientation. Building upon this foundation, multiple innovative pathways are further explored by delineating the new connotations of capability requirements and the operational logic of empowerment mechanisms. The curriculum system undergoes intelligent upgrades, integrating AI technologies at different levels while promoting interdisciplinary course integration. Teaching scenarios are digitally reconstructed, with the application of virtual simulation experimental platforms and intelligent teaching assistants enhancing the effectiveness of instruction. Industry-education integration progresses towards ecological co-construction, with enterprises participating in the establishment of AI laboratories and the cultivation of dual-qualified teaching staff, thereby aligning talent cultivation more closely with industry realities. These explorations aim to cultivate Business Administration talents capable of keeping pace with the intelligent era and meeting the new demands of industry development.

Keywords

artificial intelligence
Business Administration major
talent cultivation
curriculum system
industry-education integration

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1. Introduction

Against the backdrop of AI's deep integration into various industries, the requirements for talents in the field of Business Administration have shifted from traditional management skills to composite capabilities combining "AI + management." However, the current talent cultivation in the Business Administration major at undergraduate colleges and universities faces issues such as outdated curricula and insufficient practice, making it difficult to meet industry demands. Therefore, exploring innovative pathways for talent cultivation empowered by AI has become crucial for enhancing the quality of talent cultivation and bridging the gap with industrial development.

2. Goal Restructuring for AI-Empowered Talent Cultivation in Business Administration

2.1. Knowledge Objectives: Establishing a Composite Knowledge System of "Artificial Intelligence + Business Administration"

Students should gain a thorough understanding of the fundamental logic of machine learning, such as being able to interpret cluster analysis reports of customer consumption data and comprehend how algorithms assign labels to different customers. They should master the operational principles of big data analysis tools, such as understanding the statistical methods at work when using Excel pivot tables to process sales data. Additionally, they must grasp the applications of AI in management scenarios, such as how intelligent recommendation systems in marketing push products based on browsing history, how intelligent risk control models in finance identify abnormal transactions, and how demand forecasting algorithms in supply chains reduce inventory backlogs, integrating technical principles with management scenarios [1].

2.2. Competency Objectives: Cultivating Practical Skills in Intelligent Management

Students should be capable of using AI tools to solve real-world problems, such as extracting the most common complaints from a pile of customer feedback texts using sentiment analysis software and adjusting product strategies accordingly. When faced with fluctuations in sales data, they should be able to employ regression analysis models to identify key influencing factors. Moreover, they should learn to collaborate with individuals from different fields, such as clearly articulating management needs and understanding technical constraints when working with the IT department to optimize customer segmentation algorithms, and finding solutions through collaboration. When encountering new intelligent tools, they should not wait for others to teach them but instead experiment and learn through trial and error, such as exploring and developing report templates suitable for their company using newly released automated reporting tools [2].

2.3. Quality Objectives: Cultivate Professional Competence for the Intelligent Era

It is essential to clearly understand the boundaries of data usage. For instance, when analyzing customers' private data, one should know which information can be used for recommendations and which would violate regulations if used, and refrain from indiscriminately using data just to boost performance. In the face of AI technological advancements, one cannot afford to wait for obsolescence. For example, when an intelligent customer service system is upgraded, one should proactively learn the operational logic of the new features and explore how to use them to enhance customer satisfaction. When conflicts arise between AI-driven decisions and human judgment, one must uphold ethical standards. For instance, when an algorithm provides a clearly unreasonable recommendation for layoffs, one should propose adjustments from an ethical perspective to prevent technology from becoming a cold and indifferent tool [3].

3. Logical Framework for AI-Empowered Talent Cultivation in Business Administration

3.1. Reconstruction of Competency Requirements

Driven by the wave of artificial intelligence, the competency requirements for business administration talents are undergoing profound reconstruction,

forming a dynamic competency matrix consisting of a foundational layer, a core layer, and an extension layer. The foundational layer serves as the cornerstone of competency, requiring talents to be proficient in business data analysis skills, enabling them to extract customer preference trends from chaotic sales data. For example, by analyzing changes in quarterly repurchase rates, they can identify customer groups at the highest risk of churn. Simultaneously, they should be adept at using AI tools such as Python and PowerBI to batch-process order data with code and visualize inventory turnover in real-time through dashboards, making data a "barometer" for management decision-making. The core layer focuses on the management essence of the intelligent era, necessitating the cultivation of intelligent decision-making thinking. When facing market fluctuations, they should be able to make judgments by combining algorithmic predictions with industry experience. For example, when formulating promotional plans, they should consider both the data from sales forecasting models and the impact of unexpected weather on logistics. Additionally, they should possess human-machine collaboration leadership skills, enabling them to allocate customer groups for manual follow-up and system auto-responses reasonably when leading teams in collaboration with intelligent customer service systems, thus forming a complementary relationship between technological tools and human strengths [4]. The expansion layer focuses on long-term development, demanding that talents possess a profound understanding of business ethics and AI governance. When using customer consumption data to train recommendation algorithms, they must clearly establish red lines for privacy protection. Additionally, they should have the capability to design digital transformation strategies and construct a transformation path for "AI + supply chain" based on the actual conditions of enterprises. For instance, they can design a comprehensive digital solution for traditional manufacturing enterprises, covering the entire process from intelligent production scheduling to demand forecasting, thus avoiding blindly following technological trends. The reconstruction of this capability matrix essentially enables business administration talents to find a precise positioning at the intersection of technology and management, understanding both algorithmic logic and the essence of business.

3.2. Empowerment Mechanism Design

To empower business administration talent cultivation with artificial intelligence, a tripartite empowerment mechanism integrating technology, curriculum, and evaluation must be established. Technological empowerment should bring teaching scenarios to life. For example, an intelligent case library can be constructed to collect the latest cases of enterprise AI applications in real time. When an e-commerce platform uses intelligent pricing algorithms to enhance profits, the case library can simultaneously update its data models and decision-making processes, allowing students to dissect the variable relationships within. Virtual simulation experiments can simulate intelligent supply chain crises, enabling students to adjust inventory warning parameters within the system and observe how algorithms respond to sudden supply disruptions, thereby understanding the logic of technological applications through trial and error. Curriculum empowerment requires breaking down disciplinary barriers and developing modular "AI + management" courses[5]. For instance, in the "Intelligent Marketing" module, the first half teaches students to scrape social media data using Python, while the second half analyzes the underlying demands in the data through the lens of consumer behavior. The "AI Finance" module first covers the operation of intelligent auditing tools and then explores how algorithm-identified abnormal transactions relate to enterprise internal control processes, ensuring that technological learning remains firmly rooted in management scenarios. Evaluation empowerment should move away from "determining excellence with a single exam" and utilize learning analysis technology to track capability growth. The system can record the frequency with which students use data analysis tools, their approaches to solving virtual cases, and their cross-module learning associations. If a student is found to excel in using algorithms for sales forecasting but neglect data ethics, the system can automatically push relevant cases for supplementary learning. When most students encounter difficulties in human-machine collaboration simulations, teachers can adjust teaching priorities accordingly, ensuring that evaluations truly serve to enhance capabilities [6].

4. Innovative Pathways for AI-Empowered Talent Cultivation in Business Administration

4.1. Intelligent Upgrading of Curriculum Systems

4.1.1. Layered Integration of AI Technologies

The intelligent upgrading of curriculum systems necessitates the orderly integration of AI elements across hierarchical levels. At the foundational course level, courses like "Business Data Analysis and AI Fundamentals" should be introduced, enabling students to master the usage of Python's data analysis libraries when processing real sales data and to extract customer information from enterprise databases using SQL queries, ensuring that technical tools become "handy tools" for management analysis. For specialized courses, modifications should closely align with management scenarios. For instance, "Marketing" can incorporate case studies on intelligent recommendation algorithms, allowing students to dissect the user tagging system behind the "You May Also Like" feature on an e-commerce platform. "Operations Management" can introduce supply chain optimization simulation experiments, enabling students to observe changes in inventory turnover rates by adjusting algorithm parameters and understand how intelligent decision-making reduces costs. Expansion courses should broaden students' horizons. "AI Ethics and Business Decision-Making" can use case studies on marketing disputes caused by algorithmic discrimination to spark discussions, while "Digital Transformation Strategy" can analyze how traditional supermarkets leverage AI to restructure their online and offline businesses, helping students understand the boundaries and future prospects of technological applications [7].

4.1.2. Interdisciplinary Curriculum Integration

Interdisciplinary integration that transcends departmental boundaries is crucial for curriculum upgrading. Collaborate with the School of Computer Science to create a minor program in "Management Science + Artificial Intelligence," designing semester-long practical projects that start with real business problems faced by enterprises, such as "How to Improve Member Repurchase Rates." Management students first outline the business logic, then collaborate with computer science students to build user consumption data models, and finally use AI algorithms to generate personalized marketing strategies, completing a closed-loop training process of "problem identification-data modeling-intelligent solution." A university's "Intelligent Marketing" course adopted this model, where student teams used AI tools to analyze user browsing trajectories on e-commerce platforms, designed time-based dynamic pricing schemes, and compared conversion rates of different schemes through A/B testing. This process not only honed their data analysis skills but also deepened their marketing thinking, resulting in a 40% increase in course satisfaction compared to traditional methods and truly achieving a synergistic effect of 1+1>2 [8].

4.2. Digital Reconstruction of Teaching Scenarios

4.2.1. Construction of Virtual Simulation Experiment Platform

An immersive virtual simulation experiment platform will be established, enabling students to experience the practical operations of intelligent management in simulated scenarios. A "sandbox for enterprise digital transformation" will be developed, integrating AI technology into modules such as finance, human resources, and production. In the financial scenario, students can operate an intelligent bookkeeping system to observe how algorithms automatically identify abnormal invoices. Switching to the human resources module, they can experiment with AI recruitment tools to screen resumes and observe how the system matches candidate tags based on job requirements. Digital twin technology will be introduced to construct a "virtual factory," synchronizing real factory production line data into a virtual space. Students can adjust the parameters of AI scheduling algorithms by dragging sliders and observe real-time changes in production rhythms. For example, after optimizing material delivery routes, they can see how much the downtime of the production line is reduced, thereby understanding the impact of intelligent decision-making on efficiency through trial and error [9].

4.2.2. Application of Intelligent Teaching Assistants

Intelligent tools will serve as "invisible teaching

assistants" in the classroom, precisely meeting students' learning needs. An AI Q&A robot will be deployed to answer various student inquiries at any time, ranging from "How to use pandas for data pivoting in Python" to "How to adjust the parameters of an intelligent pricing algorithm." The robot will provide specific steps based on course examples and even recommend similar practice questions. Natural language processing technology will be utilized to analyze student assignments. For instance, when grading marketing plans, the system can identify issues such as "vague customer segmentation logic" and "insufficient data support," and provide revision directions by comparing them with excellent assignments—e.g., "Refer to the RFM model in Chapter 3 to label customers based on their purchase frequency." One university's "intelligent supply chain" experimental project has reaped significant benefits. Students, wearing VR devices, enter a virtual warehouse and use gestures to command an AI-driven automated sorting system. They can clearly see how robotic arms prioritize orders and pause at any time to adjust sorting rules. The experimental efficiency has increased by 60% compared to traditional physical sandboxes, with students stating, "It's like playing a game while mastering the knowledge" [10].

4.3. Ecological Co-construction of Industry-Education Integration

4.3.1. Co-building AI Laboratories with Enterprises

Collaborate with technology companies to establish an "Intelligent Business Innovation Center," bringing real-world business battlefields into the laboratory. Introduce desensitized datasets from enterprises, such as historical sales data from a chain supermarket and user interaction records from e-commerce platforms, combined with AI development platforms like Alibaba Cloud PAI and Tencent TI-ONE, enabling students to work as corporate data analysts. Both parties jointly design practical projects, such as "Predicting Customer Churn Using Machine Learning," where students start by organizing member consumption records, build predictive models, and ultimately propose actionable retention strategies. In "Optimizing Intelligent Customer Service Systems," students analyze real customer service conversation recordings and adjust question-answering matching algorithms to make system responses more empathetic. A notable example is the "Intelligent Retail" project between a university and JD.com, where the student team trained a demand forecasting model based on JD.com's real sales data, achieving a 15% higher accuracy than the enterprise's original model. The outstanding solutions were directly applied to the inventory planning for the 618 Shopping Festival, and the students were more thrilled to see their self-designed strategies in the festival's battle reports than receiving scholarships [11].

4.3.2. Cultivation of Dual-Qualified Teachers

To enable teachers to excel both in the classroom and in the frontlines of industry, it is essential to establish a regular mechanism for enterprise practice. Each year, teachers should be selected to engage in a 3-6-month "immersive residency" at partner enterprises. This is not a superficial observation of processes but a hands-on involvement in the entire lifecycle of AI projects. For instance, teachers may work with data teams at e-commerce companies to iterate on intelligent recommendation systems, participating from the initial design of user persona tagging systems, through tracking algorithm performance in A/B tests, to adjusting recommendation weights based on repurchase rate data. Throughout this process, they document how algorithm engineers translate business objectives like "increasing user dwell time" into feature engineering optimization plans. These firsthand, practical materials become vivid case studies in the classroom—when discussing user segmentation, teachers can dissect the "new customer-returning customer-lost customer" algorithm model they participated in, analyzing the actual impact of parameter adjustments on conversion rates [12].

Simultaneously, AI experts from enterprises are invited into the classroom as "rotating mentors," bringing not standardized courseware but industry-relevant practical projects. For example, when an intelligent site selection expert from a chain restaurant teaches, they may present students with heatmaps of pedestrian traffic, rental data, and competitor distributions across 50 business districts in a city, asking them to use AI site selection models to recommend locations for new stores. Similarly, when a supply chain algorithm leader from a manufacturing company supervises graduation projects, they may require students to train models that

predict equipment downtime risks based on three years of production failure data from a factory. These mentors also take students to workshops to observe how sensors collect data, pointing out on-site details that textbooks overlook, such as “the algorithm neglected the impact of humidity during the rainy season on equipment.” During student defenses, the questions extend beyond “what is the model’s accuracy rate” to practical challenges like “if you had a $1 million budget, which part of this solution would you implement first?” This pressure from the industry side compels teachers to guide students toward “solving real problems” in their daily teaching, ensuring that classroom knowledge is truly grounded in industry realities.

5. Conclusion

Artificial intelligence (AI) has brought new opportunities and challenges to the cultivation of talents in the field of business administration. Through goal restructuring, framework establishment, and the implementation of multidimensional innovative approaches, it is possible to align talent development with the demands of the intelligent era. This not only enhances students’ comprehensive qualities and competitiveness but also provides a direction for the sustainable development of business administration programs in universities, enabling the cultivated talents to truly play a role in the commercial waves of the intelligent era.

Disclosure statement

The author declares no conflict of interest.

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