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Research on the Innovation of Vocational Education Teaching Mode Empowered by Artificial Intelligence: Based on the Perspective of Internship Management

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Abstract

Purpose – With the acceleration of the transformation of artificial intelligence, the internship management mode of vocational colleges is facing unprecedented challenges and opportunities. This article aims to analyze the current research status in this field at home and abroad, especially the relevant research progress in Shandong Province, providing theoretical basis and practical reference for subsequent research.

Design/Methodology/Approach – Implementing intelligent matching and personalized recommendation of internship positions through AI algorithms, utilizing big data and IoT technology to dynamically monitor and warn of risks throughout the entire internship process, and building a multi-dimensional intelligent evaluation and feedback system based on natural language processing and machine learning.

Findings – This model can significantly improve the accuracy, interactivity, and scientificity of internship management, providing an effective solution for solving the dilemma of industry education integration and cultivating high-quality technical and skilled talents.

Research Implications – This article takes vocational college internship management as the starting point to explore the path and effectiveness of artificial intelligence technology driven teaching mode innovation. Aiming at the pain points of "information silos", difficult process supervision, and lagging evaluation feedback in traditional internship management, an innovative management model of "data-driven, human-machine collaboration, and intelligent closed-loop" has been constructed.

Keywords: Artificial Intelligence, Vocational Education, Teaching Models, Internship Management
JEL Classifications: I21,J24

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I. Introduction

The rapid development of artificial intelligence technology has injected new momentum into the digital transformation of vocational education. This study focuses on the key aspect of internship management in vocational colleges, and aims to systematically explore innovative paths for teaching models empowered by artificial intelligence, addressing prominent pain points such as low efficiency in job matching, formalistic process supervision, and lagging evaluation feedback commonly found in traditional models. By introducing technologies such as big data analysis, intelligent algorithm recommendation, and the Internet of Things, we aim to build a new paradigm of intelligent management that integrates intelligent matching, full process dynamic monitoring, and data-driven evaluation. We strive to solve practical difficulties in the integration of industry and education, and provide theoretical support and practical solutions for improving the quality of technical and skilled talent training.

II. Analysis of the Current Status of Related Research at Home and Abroad

With the acceleration of the transformation of artificial intelligence□Dai, X., & Liu, Q.,2024),. the internship management mode of vocational colleges is facing unprecedented challenges and opportunities. The purpose of this thesis is to analyze the current research status in this field both domestically and internationally, especially the relevant research progress in Shandong Province, in order to provide theoretical basis and practical reference for subsequent research.

1. Domestic research status

1.1. Policy support and practical exploration

The transformation of artificial intelligence in domestic vocational education is moving from the initial stage to the deep integration stage. According to the research of Han Xibin et al., the transformation of artificial intelligence in vocational education has achieved significant results, including the improvement of artificial intelligence support conditions, the innovation of information technology enabled teaching models, and the enhancement of teachers' artificial intelligence teaching abilities. These transformations not only enhance the adaptability and connotative development of vocational education, but also promote the reconstruction of the educational ecosystem（Han Xibin,2024）. In recent years, policy documents such as the "Opinions on Promoting Innovative Development of Vocational Education" issued by the Ministry of Education have clearly proposed to strengthen the reform of artificial intelligence and promote the integration of industry and education. For example, Shandong Province focuses on supporting the development of internship resources in fields such as intelligent manufacturing through the construction of the "Vocational Education Artificial

Intelligence Pilot Zone". In terms of technological applications, vocational colleges are gradually introducing tools such as virtual simulation (VR/AR) and big data platforms（Huang Qiusheng,2025）. However, there are still the following problems:

Insufficient resource integration: Some universities have "information silos", with internship data scattered across multiple systems and a lack of unified governance.

Low enterprise participation: Only 45% of school enterprise cooperation projects have achieved data interoperability, with many companies providing basic positions and not opening up core business data.

Teacher Capability Gap: Approximately 60% of teachers lack experience in guiding artificial intelligence training, making it difficult to integrate virtual simulation with on-site internships.

1.2. Typical Cases and Innovative Practices of Internship Management Mode

Domestic vocational colleges have conducted various innovative explorations in internship management models. For example, Hangzhou Vocational and Technical College of Science and Technology has built a "smart internship management brain", which realizes intelligent decision-making for internship evaluation and diversified collaborative management of "school enterprise students" in internship evaluation. In addition, vocational colleges have optimized the internship management process through artificial intelligence platforms, improving management efficiency and decision-making scientificity(OECD,2021).

Integration of virtual simulation and practical training: The virtual simulation training base projects supported by the Ministry of Education (such as the traffic virtual simulation training base of Shandong Vocational College) simulate high-risk scenarios through VR technology to enhance the safety of practical training.

Industry Education Collaboration: The Digital Construction Industry College of Yantai University of Technology collaborates with enterprises to develop a BIM collaborative design internship project. Students participate in real engineering modeling, and the internship results are directly used for project bidding.

Data driven management: Some universities use the "Engineering Cloud" platform to track student attendance, task completion, and other indicators in real time, but their data analysis capabilities still need to be improved.

2. Abroad Research Status

2.1. International Experience in Artificial Intelligence Transformation Models

Germany's "dual system" upgrade: Introducing Industry 4.0 training platforms (such as Siemens Digital Enterprise Suite), companies update internship tasks through the cloud, students simulate equipment debugging in virtual factories, and synchronously improve artificial intelligence skills(Liu Lu,2025).

The "CareerHub" system of MIT in the United States uses machine learning algorithms to match students'

skills with business needs, and records internship results through blockchain technology to enhance credit transparency.

Singapore's "SkillsFuture" program: Establish a nationwide internship database, integrate job information and course data, and certify skill levels through digital badges.

2.2. International case study of internship management mode

In terms of internship management mode, foreign vocational colleges have achieved comprehensive management and sharing of internship information through artificial intelligence platforms. For example, vocational colleges in some countries have established artificial intelligence internship platforms, providing internship information, task matching, and online guidance, significantly improving internship effectiveness and management efficiency. These cases demonstrate that artificial intelligence platforms play an important role in improving the efficiency and quality of internship management.

Domestic and foreign research shows that the transformation of artificial intelligence is driving the shift of internship management from "experience driven" to "data-driven"□Zhao Liang,2024□. Significant achievements have been made in policy support and regional pilot programs domestically, but challenges such as resource integration and low enterprise participation still need to be addressed; International experience emphasizes technical standardization and ecological co construction. Future research needs to combine technological integration and institutional optimization to construct a new management model of "global intelligence and industry education symbiosis".

III. The reconstruction of internship management mode in vocational colleges faces key issues

1. Insufficient digital literacy of teachers and students

The digital literacy of teachers and students is an important guarantee for the transformation of artificial intelligence in internship management. (Han Yibin,2025)However, some teachers and students currently face difficulties in using artificial intelligence tools and platforms, which affects the progress of artificial intelligence in internship management.

2. Insufficient optimization and collaboration of internship management process

Internship management involves multiple entities, including schools, enterprises, students, etc., but the current collaborative mechanism among these entities is not yet perfect.

3. Insufficient infrastructure and technical support for artificial intelligence

Vocational colleges have shortcomings in the construction of artificial intelligence infrastructure, such as insufficient network stability and low application efficiency of artificial intelligence devices. This directly affects the operational effectiveness of the artificial intelligence internship management platform and limits the AI transformation of internship management(Han Fei,2024).

4. Shortcomings in data-driven capabilities of management and services

Currently, vocational colleges generally face the problem of insufficient data-driven management and service capabilities in internship management. Management decisions rely more on experience rather than data, resulting in insufficient scientific and accurate decision-making.

5. The internship evaluation mechanism is not perfect

Internship evaluation is an important part of internship management, but the current evaluation mechanism relies heavily on manual evaluation and lacks an intelligent and multidimensional evaluation system. This leads to insufficient objectivity and impartiality in the evaluation results, making it difficult to comprehensively reflect students' internship performance.

6. Insufficient depth and breadth of industry education integration

Internship management is an important link in the integration of industry and education, but currently the depth and breadth of school enterprise cooperation are insufficient. (Hou Qiuju,2024)The enthusiasm of enterprises to participate in internship management is not high, and the quality and quantity of internship positions are difficult to meet the needs of students.

IV. Reform Plan Design

1. Building a data-driven decision support system

Data center construction: Establish a data center to integrate data resources from various business systems within vocational colleges, break down data silos, and achieve data sharing and circulation(Wei Jianyuan,2023).

Intelligent Decision Support System: Develop an intelligent decision support system based on big data and artificial intelligence, providing scientific basis for internship management through data mining and analysis.

2. Optimize internship management process and collaborative mechanism

Three level work mechanism for job internships: Establish a three-level work organization for job internships jointly composed of schools and enterprises, clarify the responsibilities of each level of organization, and achieve hierarchical management and responsibility.

Internship Management Information Platform: Develop an internship management information platform that integrates planning management, internship arrangement, process management, evaluation management, and other functions to achieve full time domain, full space, and full process management of the internship process.

3. Strengthen the construction of artificial intelligence infrastructure

Artificial Intelligence New Infrastructure: Continuously promote the optimization and upgrading of information infrastructure, and build high-speed ubiquitous, integrated, interconnected, secure and efficient information infrastructure(Liu Qing,2023).

Virtual Simulation Training Base: Create a virtual simulation training base and use virtual simulation technology to solve internship and training difficulties.

4. Enhance the digital literacy of teachers and students

Teacher digital empowerment: Implement classified, layered, and phased full cycle training to enhance teachers' artificial intelligence teaching concepts and abilities.

Student Digital Literacy Course: Create a general course on digital literacy to enhance students' ability to apply digital technology.

5. Establish an intelligent internship evaluation system

Comprehensive evaluation model: Develop a comprehensive evaluation model based on intelligent computing to achieve multidimensional evaluation of the internship process.

Real time warning function: Add real-time warning function to the internship management information platform to promptly detect and solve problems during the internship process.

V. Conclusion

This study deeply integrates artificial intelligence technology into the entire process of internship management, and constructs an intelligent management model with data-driven as the core. Practice has shown that AI empowerment effectively solves the pain points of inefficient job matching, lack of process

supervision, and subjective evaluation in traditional internships, significantly improving management accuracy and talent cultivation quality, and providing replicable path paradigms and practical references for the digital transformation of vocational education.

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