

Research on Enhancement Strategies for the Integration of Industry-Education Information Technology Platforms in Vocational Colleges

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Abstract: During this pivotal period in which China's vocational education is transitioning from a scale-oriented to a connotation-oriented development, efforts to reform vocational education are continuously intensifying, with the integration of industry and education consistently serving as the key logical thread in the reform of the modern vocational education system. Educational informatization stands as a crucial indicator of educational modernization, and the comprehensive promotion of educational modernization through educational informatization is a significant strategic decision for China's educational reform and development. However, integration of industry and education has not formed mutual integration and commonality between the entire school and enterprise levels in aspects such as talent cultivation, faculty construction, and scientific research cooperation, leading to a lack of a scientific evaluation system for assessing the effectiveness of this integration. Therefore, vocational colleges should actively construct an integration of industry and education information management platform based on the thinking of integration of industry and education and the ISO 25010 software quality model. This will further improve and enhance the service capabilities of the integration of industry and education information technology platform, facilitate multi-party interactive cooperation among governments, industries, enterprises, and schools, better meet the requirements of talent cultivation model transformation and innovative development in the construction of higher vocational colleges, and standardize the process of integration of industry and education, making it more transparent, visualizing data analysis, and comprehensively evaluating effectiveness.

Keywords: Vocational Education; Integration of Industry and Education; Information Technology; ISO25010.

1. Introduction

Since the beginning of the new century, China's education sector has flourished, and vocational education, as an indispensable part of higher education, has ushered in a "new spring." With China entering a new stage of development, industrial upgrading and economic structural adjustments have accelerated, leading to an increasingly urgent demand for technical and skilled talents across various industries. The importance and role of vocational education are becoming more prominent. Deepening the integration of industry and education, promoting the organic connection between the education chain, talent chain, industrial chain, and innovation chain, is of great significance in promoting the connotation construction of higher vocational colleges, comprehensively enhancing the quality of talents, and facilitating economic transformation and upgrading.

2. Challenges in the Development of Industry-Education Integration

2.1. Information Asymmetry

Industry-education integration primarily relies on offline operations, leading to opacity in the process and resulting in a mismatch between students trained by schools and the needs of enterprises. There is a lack of a coordinated communication mechanism between schools and enterprises, with schools lacking channels to understand the practical demands of enterprises, and enterprises not being involved in the teaching and talent cultivation processes of schools. The combination and optimization of resources in the industrial chain, talent chain, innovation chain, and education chain are insufficient,

leading to a low level of matching between the supply and demand of talent cultivation, causing difficulties for students in finding employment and creating a shortage of skilled workers for enterprises.

2.2. Relatively Low Enterprise Participation

The long distance between schools and enterprises results in a relatively low level of integration between talent cultivation and enterprises. This phenomenon not only leads to high costs for enterprises to share resources with schools but also directly affects the enthusiasm of enterprises to participate in talent cultivation. Although there is participation from government, industry, and enterprises in the construction of industry-education integration, the main responsibilities are unclear, and the level of participation is low.

2.3. Unreasonable Curriculum Design

The joint establishment of talent cultivation plans and the implementation of curriculum construction between schools and enterprises have not been fully realized. The courses offered by schools are overly theoretical, lacking in practical operation, and unable to meet the talent demands of enterprises. Additionally, some course standards lag behind industry development. Furthermore, schools do not put enough effort into the introduction and training of dual-qualified teachers, resulting in young teachers lacking practical experience and being unable to effectively guide students in practical operations. Moreover, teachers lack industry backgrounds, making it difficult for them to stay informed about industry trends and new technologies, processes, and materials used by enterprises. As a result, they

cannot adjust the course content in a timely manner to adapt to the pace of enterprise development, leading to a discrepancy between what schools offer and what enterprises need.

2.4. Imperfect Evaluation System

The lack of a scientific and reasonable evaluation system affects the effectiveness evaluation of industry-education integration construction, the establishment of an effective supervision and rectification mechanism, and the promotion of high-quality development of industry-education integration. Without multiple channels to collect effective data, it is difficult to scientifically and objectively assess the quality of talent cultivation, making it challenging to evaluate the implementation effects of industry-education integration objectively. Moreover, an imperfect evaluation system greatly affects the development of students' learning interests, the improvement of teachers' comprehensive qualities and practical teaching abilities, and the innovation of cooperative talent cultivation models between schools and enterprises, as well as the optimization of curriculum configurations.

In summary, most higher vocational colleges have not formed a comprehensive picture of industry-education integration at both the school and enterprise levels in terms of talent cultivation, faculty development, and research cooperation. There is a lack of a scientific evaluation system for assessing the effectiveness of industry-education integration. Therefore, it is imperative to build an industry-education integration information platform based on modern information technology, particularly utilizing information-based big data technology.

3. Analysis of the Perceived Quality of Existing Industry-Education Integration Information Technology Platforms

This study employed the ISO 25010 software quality model to measure the perceived quality of existing industry-education integration information technology platforms. Five dimensions from the ISO 25010 software quality model—usability, performance efficiency, security, portability, and functional suitability—were selected to design a questionnaire for assessing the perceived quality of industry-education integration information technology platforms. Based on the influencing factors within each dimension, a Likert five-point scoring method was used to design the questionnaire items. After review and revision by six experts in the field of industry-education integration and information technology, 400 survey questionnaires were distributed to stakeholders involved in industry-education integration in Zhejiang Province through the Questionnaire Star survey platform. These stakeholders included government administrators, enterprise managers, vocational college teachers, and students. Through the analysis of the survey questionnaire, the study aimed to understand the opinions of participants regarding the development of industry-education integration in Zhejiang Province's vocational colleges and the status of information technology platform development. This understanding would provide support for constructing the development mechanism and technical infrastructure of industry-education integration information technology platforms in vocational colleges.

Statistical methods were used to analyze the collected data

in the survey questionnaire:

1 Frequency and percentage statistics were used to display the demographic characteristics of respondents and the usage of vocational and technical education and industry-integrated information technology platforms.

2 Analysis of variance (ANOVA) was employed to test whether there were significant differences in the demographic characteristics of respondents among the data groups for each of the five dimensions.

3 Hypothesis testing methods were used to determine whether significant differences existed between samples or between samples and the population.

4 Regression analysis was conducted to study the impact of platform usability, efficiency, security, portability, and functionality on the perceived quality of industry-education integration information technology platforms in vocational and technical education.

4. Survey Results on the Perceived Quality of Industry-Education Integration Information Technology Platforms

4.1. Demographic Characteristics of Respondents:

Among the surveyed respondents, females accounted for 56.5%, slightly more than males at 43.5%. The age distribution was primarily between 30-49 years old, with 32.5% aged 30-39 and another 32.5% aged 40-49. Most respondents held a bachelor's degree (48.0%), followed by a master's degree (24.8%). The respondents represented various sectors, including government departments, vocational and technical universities/colleges, industries/companies, and research institutions. The survey covered multiple positions such as government administrators, business administrators, school teachers, and students. The majority of respondents held intermediate or higher technical titles (68.8%), indicating a certain level of professional background.

4.2. Comprehensive Assessment of Platform Perceived Quality:

In terms of platform usability, respondents were most satisfied with the platform's ease of access and learnability, while satisfaction with the platform's recognizability was relatively low. Regarding platform efficiency, respondents were most satisfied with memory usage and throughput, while satisfaction with system processing speed was relatively low. Concerning platform security, respondents were satisfied with the platform's ability to ensure service availability, identity verification, and authorized login, while satisfaction with access control capability was relatively low. Regarding platform portability, respondents were satisfied with the platform's ability to adapt and run on different hardware and its upgradeability and substitutability, while satisfaction with the installation process's ease of use and reliability was relatively low. In terms of platform functionality, the average score for all indicators was 3.2859, indicating a "Neutral" level of satisfaction.

4.3. Statistical Analysis Findings:

The analysis indicates a significant difference in platform usability among different genders, suggesting that female respondents may have different perspectives on the platform's

usability. Similarly, in terms of platform security, there is a significant difference among different education level groups, implying that respondents with varying educational backgrounds perceive the platform's security differently.

4.4. Results of the Integrated Assessment:

The performance and user satisfaction of the industry-education integration information technology platform vary across different aspects. Further improvements and enhancements are needed in platform recognizability, system processing speed, access control capability, ease of use and reliability of the installation process, as well as the functionality of the platform to meet a wider range of user needs.

4.5. Enhancing the Application of Information Technology in Industry-Education Integration:

To enhance the effectiveness of information technology in industry-education integration reform, it's crucial to consider factors across technology, policy, and talent development. Efforts should be focused on policy support and guidance, technological innovation and research, platform construction and optimization, talent cultivation and team building, demonstration projects and cooperation models, as well as evaluation and monitoring mechanisms in development plans.

5. Recommendations for the Construction of Industry-Education Integration Information Technology Platforms

5.1. Technological Innovation and Research:

Increase investment in information technology research and development to promote breakthroughs and innovations in key technologies such as artificial intelligence, big data analysis, and the Internet of Things, to enhance the application level of technology in industry-education integration.

5.2. Platform Construction and Optimization:

Build multifunctional, user-friendly industry-education integration information technology platforms that provide functions such as teaching resource management, learning management, and data analysis. Further research female users' preferences for interface design for more precise optimization.

5.3. User Training and Support:

Conduct regular training activities to help users better understand and familiarize themselves with the platform's functions, improving their efficiency of use. Establish user support channels, such as online help centers or professional user support teams, to address issues encountered by users during use.

5.4. Talent Cultivation and Team Building:

Strengthen the cultivation of information technology talents, fostering professionals with interdisciplinary knowledge and practical abilities, supporting talent exchanges and cooperation between industry and education.

5.5. Demonstration Projects and Cooperation Models:

Establish a batch of industry-education integration demonstration projects and successful cases, exploring suitable cooperation and business models to attract more enterprises and schools to participate in industry-education integration.

5.6. Evaluation and Monitoring Mechanisms:

Establish performance evaluation and monitoring mechanisms, set up user feedback channels to encourage users to provide opinions and suggestions on their platform usage experience, for timely identification and resolution of potential issues. Analyze user feedback data regularly to better understand user needs and expectations, guiding continuous improvement of the platform. Deploy performance monitoring tools to monitor platform performance indicators in real-time, ensuring stable and efficient service provision even under high loads.

6. Conclusion

Industry-Education Integration Information Technology Platform refers to a platform established by integrating resources from the industrial and educational sectors using information technology. By promoting collaboration between industry, academia, and research, integrating resources, and enhancing educational quality, it serves as a vital means to drive industrial upgrading and cultivate highly skilled technical talents.

The Industry-Education Integration Information Technology Platform revolves around the main theme of "Industry-Profession-Employment," aiming to provide comprehensive services to schools, enterprises, government, industry, and society as a whole. Through the integration of faculty, curriculum, certification, employment, research, and industry, it achieves the goals of innovation in industry-education integration models, innovative talent cultivation, innovative teaching resource development, and innovative industrial technology cooperation, thereby deepening the integration of industry and education as well as school-enterprise collaboration.

The construction of Industry-Education Integration Information Technology Platform serves as a reference for the development of relevant platforms in vocational colleges focusing on the new generation of information technology. It is expected to set a benchmark for the development of Industry-Education Integration Information Technology in vocational education in Zhejiang Province. Meanwhile, LiShui Vocational and Technical College is committed to innovating the operation of service platforms through information technology, exploring standards and guidelines for the construction of service platforms that reflect the characteristics of industry-education integration in the new era and the trend of digitalization and intelligence. Particularly, it aims to extract systematic and targeted experiences, including the overall architecture, basic functions, and educational reforms related to digital Industry-Education Integration Information Technology platforms, and formulate relevant standards to provide robust support for the construction, development, and evaluation of Industry-Education Integration Information Technology platforms in LiShui City, Zhejiang Province, and even nationwide in the future.

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