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Analysis on the Empowerment of Internationalized Vocational Education Certification to Talents' International Competitiveness under Interdisciplinary Science and Innovation

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ABSTRACT

Driven by global industrial integration and the Belt and Road Initiative, interdisciplinary science and innovation has become a core reform direction for modern vocational education. International vocational certification serves as a vital bridge linking domestic training systems with global industrial standards. This study adopts literature research and logical reasoning methods to explore the internal logic, practical dilemmas and empowerment paths of international vocational certification under the interdisciplinary education context. The research finds that blind introduction of overseas certificates, disjointed curriculum and certification standards, insufficient international teachers and superficial international industry-education cooperation restrict talent cultivation. This paper puts forward targeted optimization strategies from curriculum reform, faculty building and cooperative development. The conclusions can provide theoretical support and practical references for vocational colleges to cultivate high-quality global technical talents.

1. Introduction

Global economic integration and the overseas expansion of Chinese enterprises have greatly boosted the market demand for interdisciplinary technical talents with international visions and cross-border working capabilities. Traditional single-discipline vocational training can no longer adapt to emerging industries such as intelligent manufacturing and cross-border e-commerce, so interdisciplinary science and innovation education has been widely promoted in vocational colleges across China [7]. This new training mode breaks the boundaries of traditional majors, focuses on cultivating students' ability to solve complex problems with multidisciplinary knowledge, and attaches equal importance to innovative thinking and practical operation.

As a key part of vocational education opening-up, the internationalization of vocational qualification certification has become an important way to enhance the international recognition of

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vocational education. Many domestic vocational colleges have introduced internationally recognized credentials including IFPSM procurement certification, UK engineering machinery certification and Australian TAFE qualifications, and built a dual evaluation system combining domestic 1+X certificates and international certifications [10]. However, in practical operation, most institutions fail to integrate international certification deeply into interdisciplinary science and innovation teaching. Common problems such as blind certificate selection, separation between courses and certification rules, and lack of international teaching resources are prevalent, which greatly weaken the empowerment effect of certification on talents' comprehensive competitiveness [5].

Against this background, this paper takes interdisciplinary science and innovation as the research perspective, analyzes the interactive relationship between vocational certification internationalization and talents' international competitiveness, summarizes current development dilemmas, and explores feasible integrated development paths. It aims to optimize the vocational education training system and better serve the cultivation of international compound technical talents.

2. Research Method

2.1 Literature Research Method

The author collected and sorted monographs, journal papers, policy documents and practical cases from domestic and foreign academic databases. The research scope covered interdisciplinary talent training, vocational certification internationalization, industry-education integration and talents' international competitiveness. By combining existing research results and typical practices at home and abroad, this paper clarified core concepts, theoretical connotations and research context, and built a complete theoretical framework for follow-up analysis [4].

2.2 Logical Reasoning Method

Combined with the characteristics of vocational education and global industrial demands, this paper dialectically analyzes the internal connection and practical contradictions among interdisciplinary science and innovation, international certification and talents' international competitiveness. Based on typical cases of vocational colleges, this study summarizes realistic problems and deduces systematic, operable optimization strategies to realize the synergistic development of the three elements.

3. Results and Discussion

3.1 Core Connotation and Interactive Logic

3.1.1 Core concept definition

Interdisciplinary science and innovation in vocational education refers to breaking traditional major barriers, integrating multidisciplinary knowledge and practical skills, and carrying out integrated teaching and innovative practice around industrial innovation demands. Vocational education certification internationalization means introducing international skill standards, promoting mutual recognition of Chinese and foreign vocational qualifications, and realizing the docking of domestic training systems with global industrial norms [5]. Talents' international competitiveness consists of four core dimensions: international post adaptability, interdisciplinary innovation ability, cross-cultural communication competence and sustainable career development ability [1].

3.1.2 Closed-loop Operating Logic

The three elements form an interdependent closed-loop system. Interdisciplinary science and innovation is the basic carrier of ability cultivation, which provides knowledge and practical support for the improvement of talents' comprehensive quality. International certification acts as the unified evaluation standard and guidance orientation. It standardizes training content and ability indicators in accordance with global rules. Improving talents' international competitiveness is the ultimate goal of the whole training system. The three parts restrict and promote each other, and their coordinated development is the key to cultivating high-quality international technical talents.

3.2 Main Practical Dilemmas

3.2.1 Blind introduction of international certificates

Some vocational colleges introduce overseas certificates without overall planning and professional matching. They only pursue the quantity of international credentials while ignoring the matching degree between certification content and interdisciplinary training orientation. The selected certificates are inconsistent with the training objectives, resulting in a disconnect between certificate learning and daily teaching. Students spend plenty of time preparing for examinations, but their interdisciplinary innovation abilities cannot be effectively improved [10].

3.2.2 Disjointed curriculum and certification standards

Most interdisciplinary courses still adopt domestic teaching content. International skill specifications, assessment rules and service concepts are not embedded into curriculum design and practical training links. Two independent teaching and evaluation systems coexist, leading to low teaching efficiency. Students cannot combine certificate knowledge with innovative practice, which seriously hinders the improvement of comprehensive abilities.

3.2.3 Shortage of compound teaching staff

There is a severe shortage of teachers who possess interdisciplinary professional knowledge, fluent foreign language skills and overseas industry experience. Most existing teachers are competent in single-discipline teaching but lack the ability to guide international certification training and interdisciplinary innovation projects. The insufficient teaching capacity has become a major bottleneck restricting the in-depth development of integrated training [6].

3.2.4 Superficial international industry-education cooperation

The cooperation between vocational colleges, multinational enterprises and international certification institutions mostly stays at the level of simple exchange. Long-term in-depth cooperation mechanisms are lacking. Students have few opportunities to participate in overseas internships and real cross-border innovation projects. Without immersive international practice experience, it is difficult for them to adapt to overseas working environments.

3.2.5 Isolated evaluation mechanisms

The assessment of interdisciplinary innovation training and international certification examinations operate independently. There is no unified comprehensive evaluation system covering professional skills, innovative performance and cross-cultural literacy. The single evaluation mode cannot fully reflect students' overall international competitiveness.

3.3 Core Empowerment Paths of International Certification

3.3.1 Standard empowerment

Colleges shall revise interdisciplinary talent training plans in strict accordance with international certification standards. Decompose global technical norms, safety requirements and service concepts into each teaching and training module, and set clear international ability indicators. This ensures that talent training objectives are highly consistent with global industrial demands [1].

3.3.2 Curriculum empowerment

Integrate core knowledge and assessment points of international certificates into general courses, professional courses and innovative practical courses. Develop bilingual textbooks and international case libraries, and adopt project-based teaching. Build interdisciplinary curriculum groups to realize the organic integration of classroom learning, innovation training and certificate preparation.

3.3.3 Practice empowerment

Cooperate with multinational enterprises and international certification institutions to build cross-border training bases. Take real overseas innovation projects as the carrier, and organize student teams to carry out research and practice. Immersive international practice can effectively improve students' professional application and cross-cultural collaboration abilities.

3.3.4 Evaluation empowerment

Establish a combined evaluation mode of process assessment and result assessment. Take innovation achievements, certificate scores, foreign language proficiency and cross-cultural performance into comprehensive evaluation. The diversified evaluation mechanism guides students to develop in an all-round way.

3.3.5 Literacy empowerment

Add cross-cultural communication, international professional ethics and industrial norms into daily teaching. Rely on certificate training to cultivate students' comprehensive literacy, making up for the deficiency of soft skill training in traditional vocational education [5].

3.4 Optimization Strategies for Integrated Development

3.4.1 Select certificates scientifically and promote mutual recognition

Vocational colleges shall select international certificates based on their interdisciplinary characteristics and the demands of cooperative enterprises. Prioritize highly recognized credentials with complete standard systems. Actively promote mutual recognition between domestic 1+X certificates and international certifications to build a sound dual-certificate training mode [2].

3.4.2 Restructure interdisciplinary curriculum system

Organize professional teachers, international examiners and overseas enterprise experts to jointly revise curriculum standards. Embed international standards into all teaching links, and take interdisciplinary innovation projects as the main teaching carrier to realize the deep integration of courses and certification.

3.4.3 Build high-quality compound teaching teams

Adopt the combination of on-the-job training and external recruitment. Select excellent in-service teachers to study abroad or take internships in multinational companies. Employ overseas technical experts and certified trainers as part-time teachers to optimize the teaching team structure and improve international teaching capabilities.

3.4.4 Deepen international industry-education integration

Expand cooperation with Chinese-funded overseas enterprises and international institutions. Launch overseas internships, joint R&D and other practical projects to provide real international working scenarios for students. Form a long-term cooperative mechanism of education, industry and certification [12].

3.4.5 Improve policy and guarantee system

Relevant government departments shall issue supportive policies in terms of funds, personnel exchanges and examination approval. Vocational colleges shall set up special funds for internationalization construction, and establish regular quality supervision and dynamic adjustment mechanisms to ensure the stable operation of integrated training [4].

4. Conclusion

Interdisciplinary science and innovation, international vocational certification and talents' international competitiveness form an interdependent and interactive organic whole. At present, blind certificate introduction, disjointed curricula, insufficient teachers, superficial international cooperation and isolated evaluation systems restrict the integrated development of vocational education. International certification can empower talent cultivation effectively through five paths: standard guidance, curriculum integration, practical training, evaluation reform and literacy cultivation.

To solve existing problems, vocational colleges must select international certificates rationally, restructure interdisciplinary curricula and build compound teaching teams. It is also essential to

deepen international industry-education cooperation and improve supporting policies. The integrated mode of interdisciplinary innovation and international certification can greatly improve students' comprehensive quality and international competitiveness, and broaden their cross-border employment channels. Meanwhile, it helps promote the export of Chinese vocational education standards and enhance the international influence of domestic vocational education.

In follow-up research, scholars can carry out differentiated research according to different interdisciplinary majors and regional characteristics, and further enrich practical experience for the integrated development of vocational education.

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