
Empirical Research on the Innovation of “Chinese + Vocational Education” Digital Teaching Model under the Background of the “Belt and Road Initiative”

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Abstract: With the continuous deepening and expansion of the “Belt and Road” initiative, countries along the route have increasingly close cooperation in economic, cultural, and technological fields, and the demand for localized talents with high-level Chinese communication skills and professional technical qualities has become increasingly urgent and significant. In this context, “Chinese + vocational education” as an emerging educational model not only aims to promote international production capacity cooperation but also actively promotes cross-cultural humanistic exchanges, possessing important strategic significance and practical value. However, this model also faces various practical challenges during its promotion and development, including unbalanced distribution of teaching resources among regions, a severe shortage of qualified teaching staff, and significant disconnection between course content and local actual industrial demands. To effectively address these challenges and explore feasible solutions, this study comprehensively employs literature analysis, theoretical construction, and demand research methods, systematically exploring how digital technology can assist in the innovation and optimization of the “Chinese + vocational education” teaching model, aiming to provide theoretical support and practical references for its sustainable development.

Keywords: Belt and Road; Chinese + vocational education; Digital teaching; Teaching model innovation; Educational technology; Industry-education integration

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1. Introduction

Since China proposed the “Belt and Road Initiative” in 2013, this initiative has evolved from a strategic concept into an international cooperation action, from a vision to a stage of achievements, and has developed into one of the international collaboration platforms covering a wide range, with a large scale and multiple participants in the world today. As of 2023, China has signed over 200 cooperation documents with more than 150 countries and over 30 important international organizations, covering various fields such as transportation infrastructure, trade and investment, energy and resource development, scientific and technological innovation, and cultural exchanges. As the “Belt and Road” construction enters a

new stage of high-quality development, the bottleneck of talent demand is becoming more evident: countries participating in the cooperation, especially the developing countries along the route, urgently need compound talents who are proficient in Chinese, understand China, and possess professional skills. Such talents are crucial for the advancement, maintenance, and sustainable development of cooperation projects.

2. Innovative digital teaching model of ‘Chinese + vocational education’

2.1. Practical demand

Under the “Belt and Road” initiative, cooperation projects in various fields among the countries along the route are continuously expanding, and there is an extremely urgent need for compound talents who are proficient in Chinese and possess professional skills. The traditional “Chinese + Vocational Education” teaching model is difficult to meet the growing demand for talent cultivation in terms of teaching resources, teaching methods, and teaching efficiency. For example, in infrastructure construction projects, a large number of talents who can conduct technical exchanges in Chinese and possess relevant construction skills are needed, but the traditional teaching model is limited by geographical and teacher factors, and the scale and quality of cultivation cannot be adapted to^[1]. At the same time, with the development of the digital era, students’ learning habits and needs have also changed. They prefer to use digital resources for self-directed and interactive learning, and the traditional teaching model is difficult to meet the diverse learning needs of students.

2.2. Theoretical basis

The constructivist learning theory emphasizes the active construction and interactive learning of learners. The digital teaching model can provide students with rich learning resources and interactive platforms, promoting active learning and knowledge construction. For example, through online courses, virtual laboratories, etc., students can actively explore and learn knowledge in practice. The theory of educational technology provides technical support and method guidance for the “Chinese + Vocational Education” digital teaching model, optimizing the teaching process and improving teaching effectiveness. For example, multimedia teaching technology can present abstract Chinese knowledge and vocational skills in a more intuitive and vivid way to students, enhancing their learning interest and comprehension ability.

2.3. Policy support

The state has introduced a series of policies to support vocational education and digital education development, providing policy guarantees for the innovation of the “Chinese + Vocational Education” digital teaching model^[2]. For example, the “National Vocational Education Reform Implementation Plan” proposes to deepen industry-education integration and school-enterprise cooperation to cultivate high-quality workers and technical skills talents. The digital teaching model can better achieve industry-education integration and improve the quality of talent cultivation. At the same time, the “Education Informatization 2.0 Action Plan” promotes the high-level evolution of education informatization from integration and application to innovation, providing a favorable policy environment and development opportunities for the digital innovation of the “Chinese + Vocational Education” teaching model.

3. “Three-dimensional linkage and four-stage integration”: The core framework of digital teaching model innovation

3.1. Teaching objectives linkage

Combine the Chinese teaching objectives with vocational skills teaching objectives, and formulate targeted teaching objectives based on the Chinese ability requirements of different job positions. For example, for tourism service majors, focus on cultivating students’ Chinese communication, explanation, and written expression abilities in tourism scenarios;

for mechanical manufacturing majors, pay attention to the cultivation of Chinese abilities in technical document reading and process description. At the same time, based on the students' learning progress and ability levels, the teaching objectives should be gradually refined and deepened in stages, from the basic acquisition of language knowledge to the improvement of comprehensive vocational application abilities.

3.2. Integration of teaching resources

Integrate a variety of digital teaching resources, including Chinese learning resources and vocational skills teaching resources. On one hand, collect high-quality Chinese textbooks, teaching videos, online courses, etc., to build a digital Chinese learning resource library; on the other hand, introduce the latest vocational skills training materials, virtual simulation experiment platforms, and actual enterprise cases, to form a vocational skills teaching resource system. Integrate the two, and realize the sharing and interconnection of resources through digital platforms, facilitating teachers' flexible selection based on teaching needs, and also facilitating students' self-study and knowledge expansion^[3].

3.3. Interactive teaching evaluation

Establish a diversified teaching evaluation system to achieve the linkage of teacher evaluation, self-evaluation by students, mutual evaluation, and enterprise evaluation. Teachers evaluate students' learning through online tests, homework corrections, classroom performances, etc.; students conduct self-evaluation and mutual evaluation to reflect their learning process and learn from others' strengths; invite enterprise experts to participate in evaluation based on the actual needs of vocational positions, to assess students' vocational Chinese abilities and vocational skills levels. At the same time, use digital teaching platforms to realize real-time feedback and interaction of evaluation information, allowing teachers to adjust teaching strategies based on evaluation results, and enabling students to improve their learning methods and continuously enhance learning effectiveness.

3.4. Four-stage progressive teaching process

The first stage is basic cognition, through digital teaching methods, let students understand Chinese knowledge and the basic concepts, principles and norms in the vocational field, using colorful presentation materials, animations, etc., to help students establish a preliminary cognitive framework. The second stage is skill training, combined with specific vocational scenarios, which carry out targeted Chinese skills and vocational skills training, such as role-playing in simulated work scenarios, project practice, etc., to help students improve their application abilities in practice. The third stage is comprehensive application, organizing students to participate in actual projects or tasks, integrating Chinese abilities and vocational skills for comprehensive application, to cultivate students' ability to solve practical problems. The fourth stage is innovation and expansion, encourage students to conduct innovative practices and expand learning based on the mastery of existing knowledge and skills, such as participating in research projects, innovation activities, etc., to cultivate students' innovative thinking and career development potential.

4. Key technical support and implementation paths for digital teaching mode innovation

4.1. Key technical support

Big data and artificial intelligence technologies are important foundations for achieving digital teaching mode innovation. Big data can comprehensively collect and analyze students' learning data, including learning time, learning progress, homework completion status, exam scores, etc., thereby accurately understanding each student's learning characteristics, strengths and weaknesses. Based on these data, artificial intelligence technology can provide personalized learning suggestions and resource recommendations for students, achieving precise teaching^[4]. For example, when the system analyzes that a student is not proficient in a certain knowledge point, it will automatically push relevant learning

materials, practice questions, and explanation videos^[4]. At the same time, virtual reality (VR) and augmented reality (AR) technologies have also brought new possibilities to teaching. In the “Chinese + Vocational Education” teaching, using VR technology, realistic vocational scenarios can be created, allowing students to practice and learn in an immersive environment. For example, in the teaching of hotel service majors, students can conduct operation training, such as front desk reception and room service, through VR devices in a virtual hotel environment.

4.2. Implementation path

Establishing a digital teaching resource sharing platform is an important way to implement the digital teaching mode. The platform should integrate abundant Chinese teaching resources and vocational education resources, including textbooks, courseware, cases, videos, online courses, etc., for teachers and students to freely use. At the same time, the platform should have good interactive functions to facilitate teachers’ uploading and updating of teaching resources, and allow students to conduct learning exchanges, ask questions, and submit assignments on the platform. Additionally, strengthening the training of teachers’ digital teaching capabilities is also crucial. Schools should regularly organize teachers to participate in relevant training courses and seminars, enabling them to master advanced digital teaching technologies and methods, such as how to conduct teaching activities using online teaching platforms and how to design effective digital teaching courseware, etc.

4.3. Deep integration of technology and teaching

To achieve innovative digital teaching models, it is necessary to deeply integrate technology with the teaching process. In the teaching design stage, teachers should reasonably select and apply digital technologies based on teaching goals and students’ actual situations. For example, in the basic cognitive stage, multimedia technology can be used to create vivid and attractive teaching courseware to attract students’ attention; in the skill training stage, simulation software and online platforms can be used to allow students to conduct practical operations^[5]. In terms of teaching evaluation, an intelligent evaluation system should be introduced, combining multiple data such as students’ online learning behaviors, homework completion situations, and exam scores for a comprehensive and objective evaluation. At the same time, technology means should be utilized to achieve real-time monitoring and feedback of the teaching process, promptly adjusting teaching strategies to improve teaching quality.

5. Challenges and countermeasures

5.1. Challenges and countermeasures in technology application

In current digital teaching practices, some teachers often encounter problems such as technical equipment failures and software usage obstacles in the teaching process due to insufficient proficiency in emerging technology tools, making it difficult to fully utilize the advantages of digital teaching methods and affecting teaching effectiveness and classroom experience. To effectively address this issue, schools should actively establish a professional technical support team to provide teachers with timely and efficient technical consultation and on-site assistance to quickly resolve technical obstacles. At the same time, schools should regularly organize various technical application training and exchange discussion activities, through systematic courses and practical guidance, to enhance teachers’ technical application capabilities and encourage teachers to actively share successful experiences and innovative practices in collective lesson planning and teaching research activities, forming a good collaborative learning atmosphere, thereby comprehensively improving the overall educational technology application level of the school and promoting the deep integration of information technology and education^[6].

5.2. Challenges and countermeasures for students’ adaptation

Students have long been accustomed to the traditional teaching mode and have relied on teachers’ direct lectures and

classroom arrangements for knowledge acquisition. Therefore, when facing the requirements of emphasizing autonomous learning in the digital teaching environment, many students may feel unadopted, showing low learning enthusiasm, lack of motivation for active exploration, and significant deficiencies in autonomous learning abilities. To address this situation, teachers need to actively take measures to provide systematic guidance on learning methods, gradually cultivating students' autonomous learning awareness and abilities. Specifically, teachers can help students formulate detailed and feasible learning plans, provide clear guidance schemes, and guide students on how to efficiently and reasonably utilize various digital resources and learning tools, thereby improving learning effectiveness. At the same time, teachers should design rich and diverse interactive teaching activities, such as online discussions, group collaboration, and virtual experiments, to stimulate students' learning interest, enhance classroom participation, and promote students' active engagement in the learning process, ultimately helping them adapt and master the autonomous learning model in the digital environment.

5.3. Challenges and countermeasures in resource integration

Although digital teaching resources are abundant in quantity and variety, they are scattered and lack an effective integration mechanism, resulting in low usage efficiency and significant difficulties during the integration process^[7]. Moreover, there may be a large amount of duplication among the resources, and their quality varies greatly. Some resources are outdated and do not meet teaching needs, which affects the teaching effectiveness and user experience. To address these issues, schools should actively build a unified digital teaching resource management platform. Through a systematic approach, they should screen, evaluate, integrate and scientifically classify various resources, thereby enhancing the usability and management efficiency of the resources and providing teachers and students with more high-quality, convenient and personalized resource services. At the same time, schools should encourage teachers to actively participate in resource development work, combining their own teaching experience to create more targeted, practical and innovative digital teaching resources, further enriching the content of the resource library and promoting the overall improvement of teaching quality.

6. Conclusion

This study systematically explores the necessity, theoretical basis, core framework and implementation path of innovating the "Chinese + Vocational Education" digital teaching model in the context of the in-depth development of the "Belt and Road" initiative. The study points out that to address the challenge of the demand for multi-skilled talents in the countries along the route, digitalization is the inevitable path. The traditional teaching model needs to transform into a new model that deeply integrates digital technology, focuses on the career development of learners, emphasizes the linkage of three-dimensional goals and the integration of four-stage processes. In the future, the digital development of "Chinese + Vocational Education" will not only revolutionize teaching methods but also reshape the integration form of international Chinese education and vocational education, becoming an important force in promoting "Belt and Road" cultural exchanges and other aspects, and is expected to cultivate a large number of "Belt and Road" builders, providing a talent foundation for jointly building a community with a shared future for mankind. Subsequent research can focus on specific industry course development standards, the effectiveness evaluation of AI teaching assistants, and the validation of the psychological validity of virtual training, etc., to promote the deepening and maturity of this model.

Disclosure statement

The author declares no conflict of interest.

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