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Construction of Intelligent "Golden Textbooks" Resources to Support the Integration of "Posts, Courses, Competitions and Certificates"

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Abstract: *The integration of "posts, courses, competitions and certificates" is the core direction of deepening the reform of vocational education. Traditional textbooks have problems such as outdated content, insufficient integration of technology, and disconnection from the needs of posts, competitions and certificates, making it difficult to support the achievement of educational goals. The development of intelligent technology has provided a new path for the construction of "golden textbooks" resources. This paper clarifies the four-dimensional content system for the construction of intelligent "golden textbooks" resources, and constructs a supporting framework with artificial intelligence, big data, blockchain and VR/AR technologies as the core; it puts forward construction strategies such as establishing a collaborative construction concept, implementing the concept of dynamic generation, designing content based on post requirements, integrating competition and certificate standards for development, relying on technology to improve functions, and establishing a guarantee system. This research solves the problems of disconnection between technology and teaching, uneven content quality, etc., helps to improve the quality of technical and skilled talent training, and serves the needs of industrial upgrading and economic and social development.*

Keywords: *"Posts, Courses, Competitions and Certificates"; Intelligent; Golden Textbooks; Resources Construction*

1. Introduction

With the in-depth evolution of the new round of global scientific and technological revolution and industrial transformation, the deep integration of new-generation information technology and manufacturing industry has put forward higher requirements for the knowledge structure and ability quality of technical and skilled talents. "Posts, courses, competitions and certificates" is a comprehensive talent training model, which takes the requirements of real "post" capabilities as the orientation to reconstruct the professional "course" system and teaching content; integrates the standards, processes and content of "skill competitions" into daily teaching to promote learning and teaching through competitions; at the same time, deepens the integration of production and education by incorporating the industry standards reflected in "vocational qualification certificates" or vocational skill level certificates, so as to promote the close connection of the industrial chain, education chain and innovation chain [1]. This model aims to break the long-standing barriers between education and industry, learning and work, and academic qualifications and capabilities, enhance the adaptability and comprehensiveness of talents [2], and realize the all-round connection between the supply side of talent training and the demand side of the industry.

However, in practice, traditional textbooks have pain points such as content update lagging behind the iteration of post technologies, fragmented content [3], difficulty in integrating dynamic competition standards and certificate assessment points, and lack of intelligent interaction and personalized learning support, which have become the core bottleneck for the implementation of the integration of "posts, courses, competitions and certificates". At the same time, the accelerated application of intelligent technologies such as artificial intelligence, VR/AR and big data in the field of education has provided technical support for textbook upgrading. As the core resource of teaching [4], "golden textbooks" also need to transform from "high-quality paper-based" to "intelligent integration". In this context, relying on intelligent technology to build a "golden textbooks" resource system adapted to the needs of the integration of "posts, courses, competitions and certificates" not only responds to the policy orientation

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of national vocational education reform, but also solves the practical problem of disconnection between textbooks and industry, competitions and certificates, which has become an important issue urgently to be explored in the current field of vocational education.

Based on the urgent needs of the reform and development of national vocational education, this research focuses on the core issues of the construction of intelligent "golden textbooks" resources. At the theoretical level, it enriches and deepens the theory of vocational education textbook construction, and explores how to use intelligent technology to build a new model for the development of teaching resources and a new paradigm for application. At the practical level, it systematically constructs the resource content system and technical path of intelligent "golden textbooks", provides operable solutions for solving the current construction of vocational education resources, directly serves the whole process of cultivating high-quality skilled talents, and effectively improves students' comprehensive vocational ability and employment competitiveness.

2. Problems in the Construction of Intelligent "Golden Textbooks" Resources

2.1 Uneven Content Quality

The primary problem is that the content lacks the necessary depth and breadth. It only realizes the simple digital transfer of traditional paper-based content, fails to reconstruct and deepen the knowledge system according to the post capability requirements, and the analysis of key principles, technical logic and application background is superficial, making it difficult for students to build a systematic knowledge framework. The accuracy and scientificity of the content are facing challenges. The review and editing process of some textbooks is not rigorous, with problems such as principled errors, inaccurate data or inappropriate cases, which directly affect the credibility of the textbooks. In addition, under the background of technological innovation, the dynamic update mechanism of textbook content is lacking, making it difficult to timely absorb new industry standards, new technologies and new processes, resulting in a serious disconnection between teaching content and front-line practice, which cannot meet the cutting-edge needs of cultivating high-quality skilled talents.

2.2 Disconnection between Technology Application and Teaching Needs

In pursuit of technological novelty, some developers overemphasize the visual presentation effect of technologies such as VR/AR, ignoring the effective integration with specific teaching objectives and knowledge points, leading to flashy technology application and distracting students' learning attention. At the same time, the stability and compatibility of technical platforms are insufficient. The stuck, crash during use and data barriers between different systems not only interrupt the continuity of the learning process, but also bring additional burden to teachers' teaching management. In addition, many technical function designs are not optimized based on cognitive laws, with complex operation interfaces and unclear learning paths. Teachers need to invest a lot of time in learning operations, and students have resistance due to poor experience, resulting in advanced technical means failing to effectively serve the core goal of teaching.

2.3 Imperfect Guarantee Mechanism for Construction and Application

A large amount of funds are needed for initial development and subsequent long-term update and maintenance, but many projects lack a long-term investment mechanism, making it difficult to improve the quality of resources. Many teachers lack systematic training in applying information technology to innovate teaching models, have insufficient understanding of the functional characteristics and teaching potential of intelligent textbooks, and often only use them superficially in practical teaching, failing to give full play to the interactive and personalized diagnosis functions. At the management level, there is a lack of top-level design standards and norms, scientific evaluation systems and effective incentive measures, resulting in fragmented project construction and low-level duplication of resources. In addition, due to the inability to conduct regular monitoring and evaluation of the application effect and usage data of textbooks, it is difficult to form a virtuous cycle of "construction – application – feedback - optimization", which restricts the healthy development of the overall ecology.

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3. Construction Content of Intelligent "Golden Textbooks" Resources Supporting the Integration of "Posts, Courses, Competitions and Certificates"

3.1 Development of Digital Textbooks

Guided by post tasks, the content of traditional textbooks is systematically integrated to make it closer to the actual work needs. By using rich media technology, textbooks can integrate rich graphic, audio and video elements to realize dynamic update and interactive presentation of content [5]. Students can interact with textbooks by clicking or dragging to enhance the learning experience. At the same time, real cases of skill competitions and key points of vocational certificate assessments are integrated into textbooks to help students combine theoretical knowledge with practice. This development method not only improves the timeliness and interest of textbooks, but also supports personalized learning paths, making educational resources more flexible and adaptable, and providing a solid foundation for the integration of "posts, courses, competitions and certificates".

3.2 Virtual Simulation Training Resources

Based on real work scenarios, advanced technologies such as virtual reality and augmented reality are used to create a highly simulated training environment. Students can conduct repeated exercises in an immersive scenario, simulate post skill operations, equipment debugging or process management, thereby improving practical operation capabilities. In addition, simulated competition scenarios are specially designed in the resources to allow students to adapt to competition pressure in advance and exercise their response capabilities and psychological quality. This training method can not only solve the cost and safety problems of on-site training, but also help students identify deficiencies and optimize learning effects through real-time feedback and evaluation systems. Finally, virtual simulation training resources become an important bridge connecting classroom learning and post practice, promoting the comprehensive improvement of skills.

3.3 Integration of Online Course Resources

Centering on the needs of the integration of "posts, courses, competitions and certificates", the course content is re-deconstructed, and three core modules are set up: post capability module, competition special module and certificate preparation module. Each module is independent and organically connected. The platform is equipped with complete online learning functions, providing basic services such as video learning, data download and online notes, and at the same time, an online tutoring live broadcast room is set up to arrange teachers to answer questions regularly. To strengthen the learning effect, an intelligent testing system is developed, with built-in relevant exercises and mock test papers, supporting instant marking and error sorting, helping students achieve independent and personalized learning, encouraging students to explore independently, cultivating lifelong learning habits, and thus effectively supporting the realization of the integrated education goal.

3.4 Intelligent Learning Auxiliary Resources

By developing advanced learning tools, including learning path planning, intelligent Q&A and learning situation analysis systems, personalized support is provided for students. Learning path planning dynamically recommends appropriate learning content based on students' knowledge level and progress; the intelligent Q&A system uses artificial intelligence technology to answer questions in real time and improve learning efficiency; learning situation analysis collects learning data and generates visual reports to help teachers make scientific teaching decisions. These tools together build an intelligent learning environment, provide data support for teachers to adjust teaching content and optimize teaching methods, and allow students to independently manage the learning process, ultimately promoting the overall quality improvement of the integrated education of "posts, courses, competitions and certificates".

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4. Technologies for the Construction of Intelligent "Golden Textbooks" Resources Supporting the Integration of "Posts, Courses, Competitions and Certificates"

4.1 Artificial Intelligence Technology

Through natural language processing and machine learning algorithms, AI can deeply analyze post capability requirements and curriculum knowledge systems, realize intelligent calibration and accurate matching of content, and provide personalized learning support [6]. In the textbook development stage, AI can assist in the construction of knowledge graphs and adaptive content generation, making the textbook structure more in line with cognitive laws. The intelligent Q&A and virtual teaching assistant system can provide all-weather personalized learning support and dynamically adjust the explanation strategy according to students' interaction data. In terms of skill training, AI-driven simulation operation evaluation can conduct real-time correction and quantitative feedback on the training process. These applications jointly promote the transformation of textbooks from static knowledge carriers to intelligent tutoring platforms, providing key technical support for the integration of posts, courses, competitions and certificates.

4.2 Big Data Technology

By collecting multi-dimensional data in the learning process, including content browsing tracks, interaction frequency and evaluation results, a digital portrait of learners is constructed. The learning situation analysis engine can accurately identify knowledge weaknesses and ability gaps, providing a basis for personalized learning path planning. In terms of the optimization of teaching content, big data can reveal the internal connections between knowledge points through correlation analysis, helping teachers adjust teaching priorities. The trend analysis of competition and certificate pass rates can provide predictive suggestions for curriculum settings. The visual presentation of data dashboards enables teaching managers to grasp the resource use effect in real time, realize a data-based continuous improvement mechanism, and significantly improve the accuracy of integrated training.

4.3 Blockchain Technology

Taking advantage of its tamper-proof and traceable characteristics, key data such as students' learning processes, skill certifications and competition results can be securely uploaded to the chain. The achievement of each capability node is automatically recorded through smart contracts, forming a complete digital capability file. In terms of certificate management, blockchain can realize the distributed storage and one-click verification of vocational qualification certificates, greatly improving the credibility of certificates. The establishment of a micro-certificate system makes single skill certification possible, effectively connecting academic education and social evaluation. This technical application not only ensures the authenticity of learning outcomes, but also builds a credit bridge connecting educational institutions and employers, providing a cornerstone for the comprehensive evaluation of posts, courses, competitions and certificates.

4.4 VR/AR Technology

Virtual reality technology can restore high-risk or high-cost work scenarios, allowing students to practice repeatedly in a safe environment. Augmented reality technology can superimpose information such as operation guidelines and equipment parameters on the real work interface to realize auxiliary training combining virtual and real. According to the needs of skill competitions, a highly simulated competition platform can be developed to allow players to conduct strategic drills and psychological adaptation in a simulated environment. These technologies can not only carry out training beyond time and space constraints, but also conduct real-time evaluation of operation standardization through motion capture and three-dimensional interaction. This immersive experience greatly improves the transformation efficiency of skill training, realizing the in-depth integration of the practical links of posts, courses, competitions and certificates.

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5. Construction Strategies of Intelligent "Golden Textbooks" Resources Supporting the Integration of "Posts, Courses, Competitions and Certificates"

5.1 Establish a Resource Construction Concept of Synergy between Technology Empowerment and Educational Essence

Deeply recognize that technology is a tool to serve teaching rather than an end, and its ultimate value lies in improving educational effectiveness. In the process of resource development, we must always take promoting students' effective learning and vocational ability development as the fundamental starting point, and avoid falling into the misunderstanding of blindly pursuing technological novelty. This requires the construction team to be led by educational experts in designing the teaching logic and content system, while technical experts provide guarantee for the implementation path. A cross-field collaboration mechanism should be established to ensure that each technical application can accurately correspond to specific teaching pain points or learning needs. For example, using interactive functions to stimulate learning motivation instead of creating visual gimmicks. Only in this way can we create high-quality golden textbook resources that are both technologically advanced and in line with educational laws.

5.2 Implement the Concept of Dynamic Responsive Generation of Golden Textbook Resources

To meet the challenges of rapid industrial and technological iteration, the construction of golden textbook resources must abandon the rigid and closed model of traditional textbooks, establish the concept of dynamic responsive generation, and transform textbook updates from passive lag to active foresight [7]. This requires the establishment of a continuously evolving and self-optimizing resource ecosystem, connecting industry enterprises, colleges and universities, teachers and students for collaborative development, and timely absorbing new technical specifications, new process cases and new post requirements from the front line of production. Establish a resource use effect monitoring and feedback mechanism based on big data, and accurately identify content shortcomings and optimization directions through the analysis of students' learning behaviors, evaluation data and teachers' teaching feedback. At the same time, establish a standardized content update process and version management mechanism to ensure the iterative upgrading of textbook content, always keep pace with industry development, and truly make resources "live".

5.3 Content Design of "Golden Textbooks" Based on Post Requirements

Jointly with senior industry experts and technical experts, systematically analyze the typical work tasks and vocational ability requirements of target posts. On this basis, decompose and reconstruct the knowledge, skills and literacy required in the actual work process into structured learning content and training projects. The organization of textbook content should break the traditional disciplinary system and be arranged in the form of projects, tasks or cases in accordance with the principle of systematic work process. A complete work project can be decomposed into several learning scenarios, each of which includes clear task objectives, work processes, operation specifications and evaluation standards. This allows students to naturally master the core capabilities required by the post in the process of completing practical learning tasks, realizing the high unity of learning content and work content.

5.4 Development of "Golden Textbooks" Integrating Competition and Certificate Standards

The key to realizing the integration of "posts, courses, competitions and certificates" lies in the organic integration of the evaluation standards of skill competitions and the assessment points of vocational qualification certificates. In terms of content design, special competition modules and certificate certification modules are set up. The competition module needs to systematically analyze the competition rules, technical standards and scoring criteria of national and provincial skill competitions, and convert them into teachable and trainable learning units and virtual simulation training projects, allowing students to experience the competition atmosphere in daily life. The certificate module should fully map the knowledge points and skill points required by vocational qualification standards into textbooks, and develop a simulated assessment system to help students prepare for exams in a targeted manner. Through this integration, golden textbooks not only become the foundation of daily teaching, but also an effective support for competition training and certificate acquisition.

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5.5 Improve the Functions of "Golden Textbooks" Using Intelligent Technology

Make full use of key technologies such as artificial intelligence, big data and virtual reality to comprehensively improve functional experience. Use artificial intelligence technology to develop intelligent Q&A, learning partners and automated evaluation systems to provide students with real-time and personalized learning support. Use big data technology to continuously record and analyze students' learning behaviors and achievements, generate personalized learning reports and ability portraits, and provide data support for teachers to implement precise teaching interventions. Use VR/AR technology to build highly simulated virtual work scenarios and training environments, allowing students to practice and explore repeatedly under safe and low-cost conditions. The comprehensive application of these intelligent technologies will transform golden textbooks from static knowledge bases into intelligent learning partners that can perceive, interact, diagnose and adapt, improving learning efficiency.

5.6 Establish a Guarantee System for the Construction of "Golden Textbooks" Resources

First of all, a special working group composed of school leaders, enterprise experts, famous teachers and technical personnel should be established to be responsible for top-level design, overall coordination and quality control. Secondly, a stable multi-source investment mechanism should be constructed to integrate special school funds, enterprise cooperation funds and social support to ensure the capital needs for development and long-term updates. Thirdly, strict project management processes, resource technical standards and content review mechanisms should be formulated to ensure the standardization of the construction process and the quality of resources. Finally, a scientific evaluation and incentive system should be established, incorporating the development and application effects of golden textbooks into teachers' assessment and evaluation, and regularly collecting application feedback for continuous improvement, thus forming a virtuous cycle of "construction – application – feedback - optimization".

6. Conclusions

This research systematically explores the core connotation, content system and technical path of the construction of intelligent "golden textbooks" resources supporting the integration of "posts, courses, competitions and certificates". It can effectively break the barriers between post requirements, classroom teaching, skill competitions and vocational certification, providing a key carrier for the training of technical and skilled talents in the new era. However, the research focuses more on top-level design and path construction, and there are deficiencies in the large-scale application practice and effect verification of intelligent "golden textbooks" in specific professional fields. The universality and effectiveness need to be tested by more teaching practices. Looking forward to the future, we will conduct in-depth research on the construction standards and application models of "golden textbooks" for different professional categories, forming replicable and promotable typical cases; at the same time, build an open and shared "golden textbooks" ecosystem, promote a sustainable mechanism for multi-stakeholder collaborative participation in resource construction and update, and promote the systematic improvement of the quality of vocational education talent training.

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