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Exploring Pathways for High-Quality Textbook Development in Vocational Undergraduate Education

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Abstract: *The development of high-quality textbooks for vocational undergraduate education is a core task for enhancing the quality of vocational education and cultivating high-quality technical and skilled talents. It is also key to promoting the deep integration of the education chain and talent chain with the industry chain and innovation chain. By outlining the significance and principles of textbook development for vocational undergraduate education, and conducting an in-depth analysis of current challenges—such as imbalance between content supply and demand, a homogeneous writing structure, traditional and rigid textbook formats, and inadequate institutional frameworks—this paper proposes four key improvement pathways: establishing a content mechanism based on "competency orientation and dynamic updating"; deepening a writing model characterized by "multi-stakeholder collaboration and industry-education integration"; promoting "digital empowerment and format innovation" in textbook presentation; and improving the institutional system guided by "standards and supported by incentives and safeguards". These pathways aim to enhance the quality of vocational undergraduate textbooks, cultivate more high-quality technical and skilled talents that meet contemporary demands, and contribute to the high-quality development of vocational education.*

Keywords: *Vocational Undergraduate Education; Textbooks; Pathways*

1. Introduction

At the current critical period when China's vocational education is deepening reform and accelerating the construction of a modern vocational education system, vocational undergraduate education, as an important bridge connecting secondary vocational education and applied undergraduate education, shoulders the significant mission of cultivating high-quality technical and skilled talents. As the core carrier of education and teaching, the quality of textbooks directly affects the effectiveness of talent cultivation and the manifestation of the type characteristics of vocational education. However, the current construction of vocational undergraduate textbooks still faces many practical challenges, which seriously restrict the improvement of the quality of vocational undergraduate education. Therefore, it is particularly urgent to explore the path for the construction of high-quality textbooks for vocational undergraduate education.

2. Significance of Textbook Development in Vocational Undergraduate Education

2.1 Promoting Effective Connection between the Education Chain, Talent Chain, Industry Chain, and Innovation Chain

Textbook development for vocational undergraduate education is a crucial link in the high-quality development of vocational education, directly related to the deep integration of the education chain, talent chain, industry chain, and innovation chain. High-quality vocational undergraduate textbooks can precisely align with industry needs, ensuring that teaching content closely integrates with industry standards and vocational qualification requirements, enabling seamless connection between what students learn and market demands. This alignment not only enhances students' employability but also supplies enterprises with a large number of high-level technical and skilled talents that meet their development needs, promoting industrial upgrading and regional economic development. Meanwhile, innovative elements and cutting-edge knowledge in textbooks can stimulate students' innovative thinking, driving technological innovation and industrial upgrading, forming a virtuous cycle.

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2.2 Enhancing the Quality of Vocational Education and Teaching, Cultivating High-Quality Technical and Skilled Talents

Vocational undergraduate textbooks are the core carrier of educational and teaching activities, and their quality directly affects the outcomes of talent cultivation. High-quality vocational undergraduate textbooks can systematically present professional knowledge systems, scientifically design teaching content, effectively integrate ideological and political elements, and enhance students' comprehensive qualities and professional competencies. Through teaching models such as modularization, project-based learning, and task-driven approaches, textbooks can guide students in active learning and practical exploration, cultivating their problem-solving abilities and innovative thinking skills. Furthermore, content like case studies and practical operations in textbooks can help students better understand and master knowledge, improving their practical operational skills, and laying a solid foundation for becoming high-quality technical and skilled talents. [1]

2.3 Promoting the Digital Transformation of Vocational Education, Adapting to the Demands of Era Development

With the rapid development of information technology, the digital transformation of vocational education has become an inevitable trend. Textbook development for vocational undergraduate education must keep pace with the times, actively promote digital transformation, and develop digital textbook resources. Digital textbooks not only possess the knowledge transfer function of traditional textbooks but also feature multimedia, interactivity, dynamic updates, etc., providing a richer, more vivid, and personalized learning experience. Through digital textbooks, students can learn anytime and anywhere, breaking through time and space constraints; teachers can use digital tools for precise teaching, improving teaching effectiveness. Simultaneously, digital textbooks can promptly reflect the latest industry trends and technological advancements, ensuring the timeliness and forefront nature of teaching content, providing strong support for cultivating high-quality technical and skilled talents that meet the demands of era development.

3. Principles for Textbook Development in Vocational Undergraduate Education

3.1 Directionality Principle: Adhering to the Integration of Fostering Virtue through Education and Type Characteristics

Textbook development for vocational undergraduate education must adhere to fostering virtue through education as the fundamental task. Textbooks are not only carriers of knowledge transmission but also tools for value guidance. In vocational undergraduate textbooks, ideological and political elements within professional courses should be deeply explored, integrating elements such as national sentiment, professional spirit, and craftsmanship, achieving an organic combination of knowledge transmission and value guidance. On the other hand, textbooks must highlight the type characteristics of vocational education, replacing "knowledge-based" with "competency-based," and substituting "disciplinary system logic" with "work process systematization," emphasizing the deep integration of theoretical knowledge and practical skills. For example, in professional course textbooks, through project-based and case-based teaching designs, professional ethics, norms, and technical content can be organically combined, achieving the educational goal of "cultivating both virtue and skills."

3.2 Adaptability Principle: Aligning with Industry Needs, Serving Student Development

Textbook development for vocational undergraduate education must closely align with industry needs, reflect the latest industry dynamics and technological advancements, and ensure a seamless connection between what students learn and market demands. Textbook design should fully consider students' cognitive patterns and learning characteristics, emphasize practicality and applicability, and enhance students' practical operational abilities and problem-solving skills through teaching models like project-based learning and task-driven approaches. Simultaneously, textbooks should also pay attention to students' individualized development needs, providing diverse learning resources and pathways to assist students in growing into high-quality technical and skilled talents. [2]

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3.3 Innovation Principle: Promoting Digital Transformation, Encouraging Content Innovation

The construction of vocational undergraduate textbooks must actively promote digital transformation and utilize modern information technology to enhance the interactivity and interest of the textbooks. Digital textbooks not only have the knowledge imparting function of traditional textbooks, but also can provide a richer and more vivid learning experience through technologies such as multimedia and virtual reality. Meanwhile, the content of teaching materials should encourage innovation, promptly incorporate new knowledge, new technologies and new processes, and maintain the timeliness and cutting-edge nature of the teaching materials. This principle ensures the advanced and innovative nature of the teaching materials, providing strong support for cultivating high-quality technical and skilled talents that meet the needs of The Times.

4. Main Problems in Textbook Development for Vocational Undergraduate Education

4.1 Imbalance between Textbook Content Supply and Demand, Insufficient Integration of Theory and Practice

Vocational undergraduate textbooks face a structural contradiction in content. On one hand, existing textbooks generally suffer from an imbalance between the proportion of theoretical knowledge and practical skills. To highlight the "undergraduate" level, some textbooks simply transplant or apply the disciplinary theoretical systems of ordinary undergraduate education, resulting in an excessive proportion of theoretical knowledge, overly difficult content that deviates from the cognitive patterns of vocational undergraduate students (who often start from a practical logic) and the complex work requirements of their future positions. On the other hand, textbook content updates are slow, lagging significantly behind the iteration speed of industrial technology. Due to lengthy compilation, review, and publication cycles, textbooks struggle to promptly incorporate new technologies, techniques, standards, and cases from the industry, causing a disconnect between the knowledge students acquire and the latest industry trends. For example, in rapidly developing fields such as intelligent manufacturing and new energy vehicles, textbook content often remains stuck in traditional technology stages. [3] This lag and disconnection in content make it difficult for textbooks to fulfill their core mission of cultivating high-level technical and skilled talents capable of solving complex problems on the industrial front line, undermining their vocational relevance and teaching effectiveness.

4.2 Singular Structure of Compiling Entities, Inadequate Industry-Education Integration Mechanism

The singular composition of the compiling entities for vocational undergraduate textbooks is a key bottleneck restricting quality improvement. Currently, the compilation work is still dominated by teachers from vocational institutions. While they possess solid theoretical foundations and teaching experience, they generally lack long-term, in-depth frontline enterprise practice experience, and have an insufficient grasp of job responsibilities, technical processes, and "tacit knowledge" in real work scenarios. Although policies repeatedly emphasize school-enterprise "dual-subject" development, the participation of enterprises in textbook compilation is severely insufficient, often limited to symbolically providing sporadic cases or conducting later-stage reviews, failing to substantively and fully participate in key stages such as textbook planning, content selection, and system design.[4] Furthermore, third-party forces such as industry organizations and social training evaluation institutions have not been effectively incorporated. This singular structure of compiling entities leads to textbook content easily becoming disconnected from real industry needs and production practices, making it difficult to effectively translate "work logic" into "teaching logic," preventing the genuine implementation of industry-education integration in this critical aspect of textbook development.

4.3 Traditional and Rigid Textbook Formats, Digital Empowerment Needs Deepening

Against the backdrop of rapid information technology development and the digital transformation of education, the formats of vocational undergraduate textbooks remain traditional and rigid, struggling to meet the teaching and learning needs of the new era. Although new formats such as loose-leaf, workbook-style, and integrated media textbooks have been advocated, in practice, traditional paper-based textbooks still dominate. Their linear, static knowledge presentation methods find it difficult to vividly demonstrate dynamic work processes, complex skill operations, and teaching

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content requiring immersive experience. The few developed digital or integrated media textbooks also tend to exhibit a "technology for technology's sake" inclination, with digital resources and textbook content awkwardly fused, or merely simply linking images and videos via QR codes, lacking deep instructional design based on teaching objectives and cognitive patterns. The interactivity, dynamism, and personalized service levels of textbooks are low, failing to fully utilize technologies such as learning analytics, virtual simulation, and knowledge graphs to provide intelligent support for the entire process of "teaching, learning, assessment, and management." [5] This format lag limits the potential of textbooks, as the core learning carrier, to stimulate student interest, enhance skill training effectiveness, and expand learning time and space.

4.4 Inadequate Institutional Systems, Imperative Need to Improve Incentive and Evaluation Mechanisms

The healthy development of vocational undergraduate textbook construction requires a sound institutional system as a guarantee. Currently, significant shortcomings exist in the relevant institutional systems. Firstly, the access standards and qualification certification mechanisms for textbook compilation are unclear, leading to uneven levels among compiling teams, with some teachers lacking necessary practical experience and writing skills participating, affecting the starting quality of textbooks. Secondly, there is a serious lack of effective incentive mechanisms. For institutional teachers, the outcomes of textbook compilation often carry low weight in professional title evaluations, performance assessments, and achievement recognition, hardly comparable to research projects and academic papers, dampening the enthusiasm of excellent teachers to engage in textbook development. For enterprise and industry experts, the lack of clear value return and rights protection mechanisms results in insufficient endogenous motivation for their participation in textbook development. Finally, the mechanisms for textbook selection, evaluation, and dynamic updating are imperfect. Textbook selection sometimes lacks rigor and scientific evaluation standards; post-use tracking feedback and quality monitoring mechanisms are weak, making it difficult to form a closed-loop management of "compilation - use - feedback - revision," preventing continuous iterative optimization of textbook content and affecting the long-term vitality and adaptability of textbook development.

5. Pathways for Enhancing High-Quality Textbook Development in Vocational Undergraduate Education

5.1 Establishing a Content Development Mechanism Based on "Competency Orientation and Dynamic Updating" to Solve Imbalance and Integration Issues

To fundamentally address the disconnection between theory and practice and the slow updating of textbook content, the logic of textbook content development must be reconstructed. The primary task is to establish the core concept of "competency orientation." The selection and organization of textbook content should strictly align with the typical work tasks and comprehensive vocational competency requirements of occupational positions (clusters), achieving a shift from "disciplinary knowledge logic" to "work practice logic." Specifically, based on national professional teaching standards, vocational skill level standards, and industry enterprise standards, a systematic analysis should be conducted to extract the technical theoretical knowledge and technical practical knowledge required to solve complex technical problems. Using real production projects, typical cases, and process flows as carriers, theoretical knowledge and practical skills should be integrated into a unified design, ensuring that students learn what they will use. Simultaneously, a dynamic updating and rapid response mechanism for textbook content must be established. The development of inherently flexible textbook formats such as loose-leaf and workbook-style should be encouraged, enabling modular addition and replacement of content according to technological developments. Promoting the establishment of alliances for dynamic monitoring and revision of textbook content, involving schools, industries, enterprises, and educational research institutions, and utilizing digital platforms to shorten revision cycles, ensures that textbook content evolves synchronously with industrial technological development, maintaining its forefront and practical nature.

5.2 Deepening the Compilation Model of "Multi-stakeholder Collaboration and Industry-Education Integration" to Reverse the Singular Structure and Superficial Participation Dilemma

The key to improving textbook quality lies in building a well-structured, deeply collaborative

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compilation team. The old model of institutional teachers "working alone" must be broken, and a new pattern of "schools, enterprises, industries, research institutions" as multi-stakeholder collaborative compilers should be constructed. The core is to establish effective mechanisms and incentive mechanisms for the deep participation of enterprise experts. On one hand, the principal role of enterprises in textbook development should be institutionally clarified, implementing a "dual chief editor" system (institutional experts and enterprise experts serving as co-chief editors), ensuring that frontline technical personnel and skilled craftsmen from enterprises not only provide case materials but also fully participate in key stages such as textbook planning, content design, knowledge refinement, and final review, transforming their "tacit knowledge" into teachable and learnable explicit knowledge. On the other hand, researchers from industry organizations and social training evaluation institutions should be actively involved to provide professional support for aligning textbooks with vocational skill level standards and reflecting the latest industry trends. Institutions should assign "dual-qualified" teachers with both profound theoretical knowledge and certain enterprise practical experience as core compilers, responsible for transforming practical knowledge from industry into systematically arranged content according to educational principles. By establishing regular industry-education dialogue platforms, sustained communication and collaboration among multiple stakeholders can be ensured, guaranteeing that textbook content possesses both educational and vocational characteristics.

5.3 Promoting "Digital Empowerment and Format Innovation" in Textbook Presentation to Transcend Traditional Rigidity and Functional Limitations

In the face of the digital wave in education, vocational undergraduate textbooks must proactively carry out form innovation and digital transformation. New forms of teaching materials such as loose-leaf style, work manual style and multimedia teaching materials should be vigorously developed and popularized. However, their construction should not merely remain at the level of form, but should delve into the logic of content organization and functional design. The "flexibility" of loose-leaf textbooks should be reflected in their modular structure, which allows for content replacement, addition or deletion at any time in accordance with technological development. Work manual-style teaching materials should draw on the practicality of enterprise operation procedures to guide students to complete their work tasks as if they were on-the-job personnel. The construction of digital teaching materials is of Paramount importance. It should not merely be the simple electronicization of paper teaching materials, but rather a comprehensive learning carrier that integrates multi-modal resources such as text, images, audio, video, animation, virtual simulation, and interactive test questions based on curriculum standards. We should fully leverage the advantages of digital technology to visualize and simulate complex principles, high-risk operations and precise processes, and create immersive learning scenarios. Meanwhile, digital teaching materials should be embedded with intelligent learning support systems, featuring functions such as learning behavior tracking, personalized path recommendation, online assessment and immediate feedback, to achieve intelligent empowerment of the entire process of "teaching, learning, assessment and management", thereby expanding the learning time and space and enhancing learning interest and efficiency.

5.4 Improving the Institutional Support System Characterized by "Standard Guidance and Incentive Guarantees" to Address Institutional Gaps and Lack of Motivation

A sound institutional system is the fundamental guarantee for the sustainable development of high-quality textbook construction. Firstly, top-level design should be strengthened, accelerating the improvement of various standard systems for vocational undergraduate textbooks, including compilation access standards, content review standards, quality evaluation standards, etc., providing clear norms and guidance for textbook development. Particularly, the qualification requirements for textbook compilers must be clarified, raising the entry threshold for compilation teams. Secondly, scientific and effective incentive mechanisms must be established. Education administrative departments and schools should collaboratively reform teacher evaluation mechanisms, assigning textbook compilation outcomes, especially those of national/provincial planning textbooks and high-quality new-format textbooks, equal or even greater weight compared to research projects and academic papers in professional title evaluations, performance distribution, and awards, stimulating the enthusiasm of excellent teachers to participate in textbook development. For the industries, enterprises, and experts participating in textbook development, reasonable intellectual property protection and benefit-sharing mechanisms should be explored, providing them due returns and respect through service procurement, achievement awards, naming recognition, etc. Finally, the mechanisms for textbook selection, usage monitoring, and continuous improvement need refinement. A collective

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decision-making system for textbook selection committees should be established, strengthening the tracking, evaluation, and feedback on textbook usage effectiveness, and using the evaluation results as an important basis for textbook revision and republication, forming a virtuous closed-loop management system of "planning - compilation - selection - use - feedback - updating."

6. Conclusion

The construction of high-quality textbooks for vocational undergraduate education is a systematic project concerning the type characteristics and long-term development of vocational education. This article, through addressing the core issues currently faced in textbook construction, proposes four improvement paths. These paths are interrelated and mutually supportive, jointly forming a practical framework for promoting the advancement of vocational undergraduate textbooks from "having" to "excellent". The construction of vocational undergraduate textbooks must closely align with the trends of industrial upgrading and technological transformation, and incorporate the concepts of integrating industry and education as well as science and education throughout the entire process of textbook development, application and update. It requires educators, industry enterprises and all sectors of society to form a united force, with a continuous spirit of innovation and solid practical actions, to jointly refine high-level teaching materials that can not only convey knowledge and cultivate skills, but also shape value and inspire innovation. These measures are conducive to cultivating outstanding engineers who support modern industries and achieving high-quality development of vocational undergraduate education.

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