

Research on Training Mode of Equipment Manufacturing Specialty in Vocational Colleges from the Perspective of “Three Education” Reform

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Abstract: With the continuous advancement of vocational education reform, comprehensively promoting the reform of the “three educations” based on the characteristics of professional teaching has become an urgent issue for equipment manufacturing specialties and teachers in vocational colleges in the new era. This paper delves deeply into the reform of the “three education” within the context of new changes and objectives in the training of equipment manufacturing professionals in vocational colleges. It proposes a series of reform paths for the existing personnel training mode, aimed at better adapting to the needs of equipment manufacturing professionals in the new era. These reforms aim to promote the qualitative development of vocational education, enhance the relevance and effectiveness of personnel training, and are intended solely for the reference of relevant stakeholders.

Keywords: Reform of the three educations; Vocational colleges; Equipment manufacturing; Personnel training mode; Reform path

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1. Introduction

With the continuous progress of science and technology and the advent of the Industry 4.0 era, the demand for talent in the equipment manufacturing industry is becoming increasingly urgent, accompanied by higher specifications and quality requirements for these talents. As crucial institutions for nurturing highly skilled professionals, vocational colleges and universities play a pivotal role in both industry development and enhancing national competitiveness. Particularly, amidst the ongoing “three education” reform, the training of equipment manufacturing professionals in vocational colleges faces unprecedented opportunities and challenges.

In response, both equipment manufacturing majors and educators must adapt to the new landscape of vocational education reform. They should actively explore effective paths for reforming the “three education”

framework within their fields, aiming to comprehensively enhance the quality of professional training. By doing so, they can contribute to the provision of more high-quality and well-rounded equipment manufacturing professionals to meet the needs of society.

2. The new changes in training equipment manufacturing professionals in vocational colleges from the perspective of “three education” reform

With the continuous improvement of the state’s focus on vocational education, especially with the introduction of the National Implementation Plan for Vocational Education Reform and the Opinions on the Implementation of the Plan for the Construction of High-level Vocational Schools and Majors with Chinese Characteristics, vocational education has encountered unprecedented development opportunities. Against this backdrop, the reform of the “three education” – teaching materials, teaching methods, and comprehensive deepening of teachers – has brought significant new changes to the training of equipment manufacturing professionals in vocational colleges ^[1,2].

2.1. The practicability and prospectivity of teaching material content

Textbooks serve as crucial conduits for talent development. Under the perspective of “three education” reform, the compilation of professional teaching materials for equipment manufacturing in vocational colleges should place greater emphasis on prospectivity and practicability. Specifically, textbook content should closely align with the current equipment manufacturing industry, enterprise position requirements, and talent needs. Moreover, it should integrate new processes, standards, and technologies to further enhance the practicality and professionalism of vocational education ^[3]. Additionally, teaching materials should focus on nurturing students’ innovation and sustainable development capabilities, guiding them toward enhanced learning and growth, thereby laying a strong foundation for their future employment and development.

2.2. Innovation and flexibility in teaching methods

The “three education” reform advocates for flexible and innovative teaching methods, particularly those centered on student needs. In this context, the teaching methods for equipment manufacturing specialties in vocational colleges require urgent reform. Professional educators must prioritize the use of diverse teaching approaches, ensuring alignment with the overarching trend of vocational education reform and addressing students’ interests and needs. This approach effectively enhances the relevance of education and teaching, enabling students to gain deeper knowledge, enjoyment, and personal growth in vocational classes ^[4].

2.3. Professionalization and diversification of teaching staff

Under the auspices of the “three education” reform, the teaching staff within equipment manufacturing majors in vocational colleges should progressively evolve toward specialization and diversification. This necessitates vocational colleges’ attention to teacher training, actively providing opportunities for educators’ self-improvement and professional development. Simultaneously, teachers within equipment manufacturing majors should actively pursue various avenues for self-learning and improvement, continuously refining their professional skills and enhancing their overall competencies. By injecting fresh vitality into professional teaching, they can comprehensively propel the modernization, reform, and development of equipment manufacturing majors ^[5].

3. The training objectives of equipment manufacturing professionals in vocational colleges in the new era

In the contemporary period, guided by the new vocational education concept, the training objectives for equipment manufacturing majors in vocational colleges have undergone further clarification and enhancement. Through extensive market research, consultations with enterprises, and exchanges with industry experts, we have progressively refined and enhanced the training objectives for equipment manufacturing majors to better align with the current societal and enterprise needs.

First and foremost, the objective is to cultivate high-quality skilled professionals with a firm ideological and political foundation, coupled with a comprehensive blend of skills and technical proficiency, fostering all-around development. This entails not only ensuring students possess solid professional knowledge and skills but also instilling strong professional ethics, a sense of innovation, and teamwork capabilities. In the realm of equipment manufacturing, this translates to students being proficient in modern equipment manufacturing technology, cognizant of industry trends, and equipped with problem-solving abilities.

Secondly, emphasis is placed on nurturing students' practical skills and fostering an innovative and entrepreneurial mindset. By employing scientific and effective methods to cultivate students' innovative practical abilities and entrepreneurial spirit, we aim to enhance their future employability and development prospects, bolstering their overall strength and competitiveness in the job market.

Furthermore, the objective is to facilitate the seamless integration of students' professional competencies with vocational aptitude. This necessitates students not only acquiring professional knowledge during their academic tenure but also gaining insights into enterprise employment demands through various avenues, thereby enabling them to chart their career development trajectory in advance.

4. The reform path of professional personnel training mode in equipment manufacturing at vocational colleges under the perspective of “three education” reform

4.1. Textbook reform: Optimizing content structure to meet industry needs

As the repository of knowledge and the foundation of teaching, teaching materials play a pivotal role in the education of personnel for equipment manufacturing majors in vocational colleges. They serve not only as vital tools for students to acquire knowledge and develop skills but also as a conduit linking educational institutions with societal demands. However, many vocational colleges face challenges with their equipment manufacturing textbooks, including rigid structures and a disconnect between theory and practice, which ultimately impact the effectiveness of teaching and learning in this field. Therefore, in line with the principles of “three education” reform, comprehensive reform of teaching materials is imperative to optimize content, align with industry requirements, and lay the groundwork for enhancing the quality of professional personnel training.

Firstly, optimizing the content of professional teaching materials is essential. Given the continual advancements in science and technology, new technologies, processes, and standards emerge continuously in equipment manufacturing. Consequently, our teaching materials must remain abreast of industry developments, integrating these new elements promptly to ensure their relevance and foresight. By incorporating new knowledge, skills, and vocational certifications, students can master the most cutting-edge expertise through learning, thus establishing a solid foundation for their future career development^[7].

Secondly, optimizing the content structure of teaching materials and continually enhancing their quality is crucial. Historically, equipment manufacturing textbooks prioritized knowledge integrity and systematization, often neglecting students' cognitive processes and learning patterns. In response, targeted optimization and

innovation are necessary. For instance, adopting a project-based and modular approach can optimize textbook structure, facilitating the effective integration of theoretical knowledge and skill teaching. This approach strengthens practical application across various knowledge points, making it easier for students to learn, practice, and master concepts, thereby laying the groundwork for cultivating their comprehensive professional quality and innovative practical abilities ^[8].

Furthermore, actively promoting the development of school-based teaching materials is essential for sustaining the vitality of teaching material reform. Given the variations in institutional conditions, teacher capabilities, and regional industry characteristics, standardized national or provincial teaching materials often fail to fully meet individual school requirements ^[9]. Consequently, vocational colleges and equipment manufacturing departments should develop characteristic school-based textbooks tailored to local industry needs. These materials should closely align with regional industry development needs and employment standards, reflecting the practicality and professionalism of vocational education. Additionally, enterprises can actively contribute to the development of school-based courses based on job positions, enhancing the alignment between teaching content and enterprise demands. This deeper school-enterprise cooperation promotes the comprehensive development of production-education integration, thereby providing robust support for enhancing educational quality.

4.2. Teaching method reform: Innovating methods to enhance education quality

Traditional cramming teaching in equipment manufacturing majors at vocational colleges can no longer suffice in modern vocational education. To cultivate high-quality talents proficient in both theoretical knowledge and practical skills, teaching method reform is imperative. From the perspective of “three education” reform, equipment manufacturing majors and teachers must discard traditional educational concepts, actively explore diverse and scientifically grounded teaching methods, comprehensively enhance the educational outcomes of this major, and elevate the quality of talent training to a higher level.

Firstly, promoting integrated teaching reform is essential to deepen the integration of practical teaching. This approach enables students to “learn”, “think”, and “do”, fostering a learning environment where students apply theoretical knowledge in practical scenarios. For instance, in equipment manufacturing courses, designing practical projects closely aligned with course content enables students to acquire theoretical knowledge and practical skills concurrently. Additionally, simulated practical training and on-the-job practice expose students to real or simulated working environments, stimulating their learning interest and cultivating vocational skills and professional literacy ^[10].

Secondly, incorporating information technology is crucial to promoting teaching method reform. With the rapid advancement of information technology, multimedia, networks, and virtual simulation teaching methods have become prevalent in education ^[11]. In equipment manufacturing majors at vocational colleges, attention to information technology is essential. Incorporating micro-lessons and multimedia videos into classrooms creates a modern and engaging teaching environment.

Moreover, fostering collaboration with enterprises to implement job-oriented teaching reforms is essential. Involving enterprise technical personnel in classroom teaching and practical training guidance and integrating real-life cases and projects from enterprises into teaching expose students to actual industry challenges and needs, further enhancing students’ comprehensive abilities ^[12].

4.3. Teacher reform: Enhancing teacher quality to drive reform

Firstly, active promotion of the cultivation and improvement of teachers’ professional quality is paramount.

Vocational colleges and universities should encourage teachers to participate actively in industry training, engage in enterprise practices, and partake in other relevant activities^[13]. Through industry training, teachers can stay abreast of the latest trends in industry development and technological advancements, continuously updating their knowledge base. Additionally, guiding teachers to participate in enterprise projects and practical experiences fosters a deep understanding of the production processes and technological applications within equipment manufacturing enterprises, comprehensively enhancing their technological proficiency and practical abilities. Moreover, schools should actively encourage teachers to engage in scientific research projects and participate in teaching reform initiatives, fostering a research-oriented teacher team and promoting the professional development of equipment manufacturing educators.

Secondly, efforts must be made to facilitate “bringing in” and “going out” initiatives. This involves actively establishing collaborative relationships with enterprises and integrating experienced industry professionals and high-level theorists as part-time teachers or visiting professors. Their involvement in classroom teaching, practical training guidance, and curriculum development enriches students’ learning experiences with practical insights and real-world scenarios. Simultaneously, cultivating an internal “double teacher” team and collaborating with enterprise personnel and vocational skill level certificate institutions enables teachers’ professional development, facilitating their transition from “professional” educators to “double-qualified” teachers^[14].

Furthermore, enhancing the teacher incentive mechanism is crucial to stimulate teacher development. Establishing and refining performance appraisal and salary distribution systems at the material level ensures that teachers’ income reflects their teaching performance and contributions. At the spiritual level, attention to teachers’ professional development and personalized growth provides them with ample opportunities for career advancement within a supportive professional environment. Additionally, reinforcing the cultivation of teachers’ ethics and professional demeanor fosters dedication and high-quality teaching standards, comprehensively elevating the proficiency of equipment manufacturing educators^[15].

5. Conclusion

In summary, the “three education” reform has presented both new opportunities and challenges for the training of equipment manufacturing professionals in vocational colleges. It is imperative that we deeply comprehend the evolving landscape of training in this field within the framework of the “three education” reform. By aligning with the new objectives and emerging needs, we must embark on a scientific reform of teaching materials, teaching methods, and teacher training. Through these efforts, we can provide effective support for enhancing the overall quality of professional education, teaching, and talent development.

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