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Practical Exploration of Training High skilled Information Technology Talents through "Integration of Curriculums and Competitions" Based on Vocational Skills Competition

Shuying Wu

Artificial Intelligence College of Wenzhou Vocational and Technical College, Wenzhou, Zhejiang 325035, China

434473507@qq.com

Abstract

Vocational skills competition is an important mechanism to link economic industry with vocational college teaching. This paper proposes "integration of curriculums and competitions" integration based on vocational skills competition to cultivate highly skilled talents, and takes the training of new generation information technology talents in higher vocational colleges as an example, implements the teaching reform. Integrate the competition contents and evaluation standards of vocational skills competition into the curriculum standards and curriculum contents, deepen the connection between teaching standards and competition standards (post standards), teaching process and production process, promote the authenticity of training projects, the working of teaching process, the standardization of training process, the normalization of professional quality training, and improve the quality of talent training and international adaptability. The practice of teaching reform has proved that students' interest in learning has been greatly improved and the training effect has been significantly improved.

Keywords

Integration of curriculums and competitions ; Vocational skills competition; Vocational education;International adaptability.

1. Introduction

Training highly skilled talents is the core goal of higher vocational education, and vocational skills competition is the "touchstone" of vocational colleges' teaching quality, which has multiple functions such as guiding the concept of higher vocational education, talent training mode, curriculum system and structure transformation [1]. The vocational skills contest has the characteristics that the title of the contest reflects typical work tasks and the evaluation mode reflects professional post evaluation. It can comprehensively investigate the engineering practice ability, design ability, innovation ability and professional quality of the contestants. The international vocational skills contest also has the advantages of meeting the needs of international posts and improving the international adaptability of talents. With reference to the characteristics and evaluation strategies of domestic and foreign vocational skills competitions, the research group took the training of information technology talents in higher vocational colleges as an example, and under the guidance of the concept of results oriented education (OBE), actively promoted the practical exploration of "integration of curriculums and competitions" based on vocational skills competitions to cultivate highly skilled information technology talents.

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2. The foothold of "integration of curriculums and competitions" talent training reform

2.1. Characteristics of vocational skills competition

Vocational skill competitions (including national and international vocational skill competitions) are organized mass competitions based on domestic and international vocational skill standards and in combination with the actual production and operation, focusing on highlighting operational skills and solving practical problems. The newly promulgated Vocational Education Law mentions that the state provides a platform for technical and skilled talents to show their skills and learn from each other by organizing vocational skills competitions and other activities, and continuously trains more high-quality technical and skilled talents, skilled craftsmen and craftsmen from large countries.

Through research, it is found that the vocational skills competition has the following characteristics.

(1) Reflect the industry post standards corresponding to the events

Both international and domestic vocational skills competitions agree with the concepts of "vocational skills cannot be inspected and distinguished through one examination question" and "high-quality skills examination needs to be conducted in real work situations (in the way of situational examination)". The examination questions of each event are designed according to the concept of "Professional Task" of the profession, which is a comprehensive task with complete work process structure, It is a task representing the professional level of a profession, and the requirements of the industry on the job's professional knowledge, ability and quality are mapped to the competition items and their evaluation.

(2)Reflect the latest achievements and trends of industry development

The items of vocational skills competitions are closely related to the production practice and industrial hot spots. The examination questions of industrial events often reflect the latest achievements and trends of the industry development, which is forward-looking and leading to a certain extent, and also reflect the gold content of the latest industrial skills, which can promote the training of skilled personnel [2].

(3) Reflect the professional concept, skills and accomplishments of the contestants

As the competition item test is a challenging real task, such a task can enable students to demonstrate their ability to think, question, research, decide, present and realize, and the competition medal can fully reflect the professional concept, skills and quality of the contestants.

Evaluation strategy reflecting vocational skill appraisal

Most of the vocational skills competitions adopt authenticity evaluation, which is helpful for the participants to demonstrate their ability to apply knowledge and skills by completing authentic tasks similar to the work situation. At the same time, the "analytical gauge" is used to describe the evaluation details in detail and subdivide the scores [3], which is more conducive to judging the work performance and task completion of the participants. This evaluation strategy is often used in industry and vocational skills identification to obtain "skill certificates", The skill certificates corresponding to the International Vocational Skills Competition are also called "skill passports".

Education experts pointed out that the vocational skills competition has the effect of "enhancing the initiative of vocational colleges and business owners to establish cooperative relations, promoting teaching models and promoting the reform of teaching methods", and is the "baton" of vocational colleges' teaching and the "linker" of the combination of production and teaching [4].

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Taking the "mobile application development event" of the BRICS Vocational Skills Competition as an example, the event is jointly designed by the industry, school and enterprise. Guided by market demand, it is aimed at students and social personnel in secondary vocational schools and colleges across the country majoring in electronic information engineering, computer and software engineering, and promotes education, learning, and research through competition, Actively promote the demand of Internet plus software industry and the rapid development of new generation information software technology. The competition is designed around the technology development trend in the field of mobile application development and the typical job skills in industrial applications. It combines the typical job skills and professional construction standards in the field of mobile application development with the content of the competition. It aims to examine the contestants' engineering practice ability, design ability and innovation ability in mobile application development under the real project environment of the enterprise, as well as team cooperation, communication ability, anti pressure Professional standards and other professional qualities to show the skills and style of students in relevant majors, stimulate students' curiosity and enthusiasm to participate in teaching activities, so as to achieve the goal of "promoting learning through competition"; At the same time, we will build a school enterprise cooperation platform, guide more industry enterprises to participate in school enterprise cooperation, deepen the integration of industry and education, and promote the talent training mode of integration of industry and education, so that the participating institutions can more clearly understand the development trend of the industry and the industry's demand for talents.

2.2. Inspiration of vocational skill competition for "integration of curriculums and competitions" to facilitate talent training

As the competition reflects the needs of industry enterprises for jobs, skills assessment, "skills passport" (skills certificate) and other talent needs, the "course match" integration here actually covers the concept of "post course match certificate" integration. "Post" is the standard of curriculum learning, and the content of curriculum should aim at the post demand; "Class" is the core of teaching reform. Through curriculum reform, we should promote "classroom revolution" and improve the quality of talent training; "Competition" is a high-end demonstration of curriculum teaching; "Certificate" is the industry test of course learning [5].

The skills competition in vocational colleges is oriented by vocational ability and closely related to the professional curriculum system, content, teaching and evaluation. It is an important task for the development and reform of vocational education and an effective way to cultivate skilled personnel [3]. However, at present, there are still some problems in the "competition" integration, such as how to systematically connect the talent training program with the skills competition, how to improve the narrow benefit range of students in the skills competition, and how to solve the "two skin" phenomenon of classroom teaching and skills competition. Taking the training of new generation information technology talents in higher vocational education as an example, the research group implemented education and teaching reform, integrated the contents and evaluation standards of vocational skills competitions into curriculum standards and teaching contents, deepened the connection between teaching standards and post standards, teaching process and production process, and promoted the authenticity of training projects, the working of teaching process, the standardization of training process, and the normalization of professional quality (cultivation), Improve the quality of talent training and international adaptability, and cultivate high-quality technical and skilled talents.

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3. Exploration of cultivating highly skilled talents through "integration of curriculums and competitions"

3.1. Take the competition as an opportunity to promote the reform of training highly skilled talents through "integration of curriculums and competitions"

Taking the cultivation of information technology talents as an example, based on the need of China's information technology service industry to go abroad to undertake more information projects along the the Belt and Road, and the need to provide excellent information technology talents with comprehensive skills for China and countries along the the Belt and Road, information technology majors take the opportunity of organizing teachers and students to participate in domestic and international vocational skills competitions, on the one hand, "export" to test the learning effect through participation Strive for "skill passport", undertake international information technology service projects, and export international information technology services. On the other hand, "bring in", draw on the resources of vocational skills competition, build the "integration of curriculums and competitions" standard, and reconstruct the relevant curriculum system and teaching mode and improve adaptability. The "course competition" integration standard is put into the talent training system, the vocational skill standard and vocational competition standard are integrated into the vocational teaching standard, the competition project is integrated into the talent training program, the competition content is integrated into the teaching content, and the evaluation standard is integrated into the curriculum evaluation. Through the "course competition" integration, typical guidance, high-end drive, and external traction, the talent training mode reform is promoted, and the effective way of cultivating highly skilled talents is explored.

3.2. The implementation of "integration of curriculums and competitions" talent training based on vocational skills competition

The competition is a display stage for top talents, with a narrow range of benefits. In order to make the competition benefit all students of a major and improve the range of benefits, the research team implemented the following teaching reforms: learn from the professional skills competition the development trend of the industry and the standards for talent demand, reconstruct the curriculum system and teaching content, reform the teaching mode, build curriculum teaching resources, promote the authenticity of training projects, the working of teaching process, and the standardization of training process Normalize professional quality (training), improve the quality of talent training and international adaptability.

Take the "Mobile Application Development" competition as an example. See Fig.1,the competition is based on the professional standards of mobile application development, combined with the actual situation of the industry at home and abroad to organize the proposition, adopt the actual operation form, and program on site. Through "demand analysis", "preliminary design", "functional module development", "testing and delivery" and other contents, the competition examined the contestants' coding ability, document writing ability, comprehensive analysis ability, technical architecture design ability, big data analysis ability, etc. of actual engineering projects. The research team absorbs resources from the competition, integrates professional resources, competition resources and teaching resources for the curriculum system involved in the training of mobile application development ability of software technology major, constructs a broad and active mobile application development ability curriculum system, and reforms the teaching mode according to the law of individual cognition and ability development.

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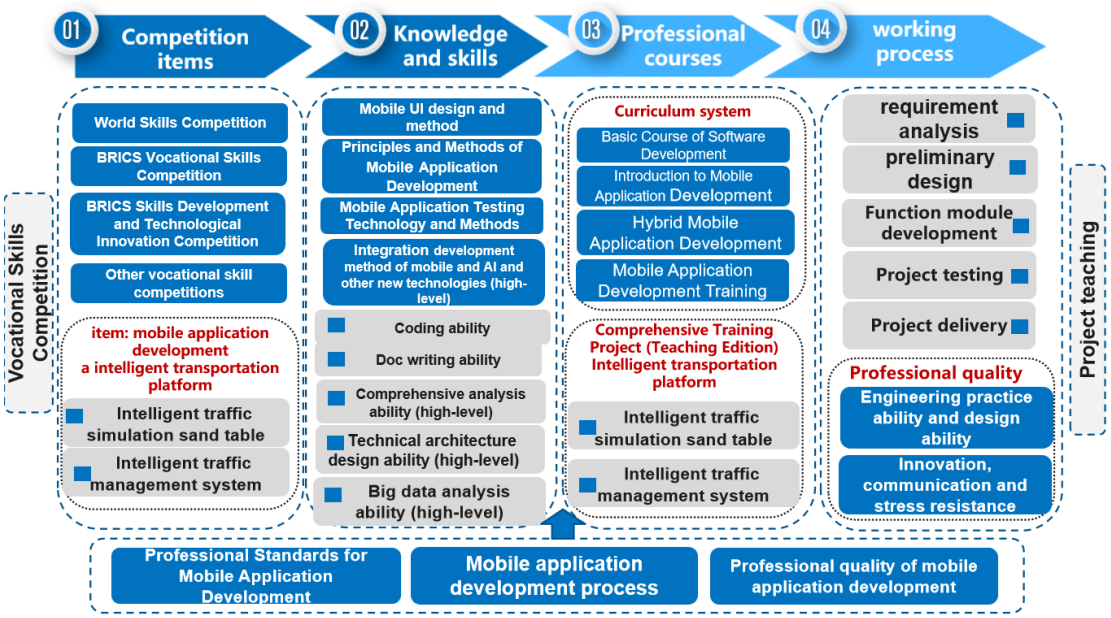

Fig.1 Financing Diagram of "Mobile Application Development" Course Competition

(1) Reconstruction and optimization of curriculum system

Curriculum is the direct carrier to realize the orientation of talent training specifications and the core of teaching reform. The research team analyzed and summarized the professional ability requirements of the post group through the research on the vocational skills contest and its involvement in relevant enterprise posts, fragmented and project-based transformation of the national skills contest resources [6], decomposed and classified the knowledge points, skills points and professional qualities involved in the skills contest, and modularized them The curriculum teaching standards (and the matching new technology, ideological and political elements into the curriculum standards) and the teaching contents of related courses are integrated in an orderly manner, so that the curriculum system is integrated with the professional posts and professional skills competitions, and a training platform compatible with the skill competition standards and experimental training is established, which effectively uses the teaching resources.

First, rely on the vocational skills competition to establish a comprehensive training project library to realize the authenticity of training projects.

As the competition items of the vocational skills competition are designed by ourselves, the school and the enterprise, close to the real project of the enterprise, the competition items will be transformed into teaching items after each competition, the scattered knowledge and skills points will be designed into curriculum teaching items, and the comprehensive application of the competition items will be designed into senior comprehensive training items, which will be enriched into the existing comprehensive training item library to realize the authenticity of the teaching items, and explore the integration of lessons and competitions from the teaching content.

Second, the enterprise project development process is introduced into the teaching implementation to realize the working of the teaching process.

In the teaching implementation stage of the comprehensive training project, we followed the enterprise project development process of "demand analysis", "preliminary design", "functional module development", "testing and delivery" and introduced them into the teaching implementation, connected the teaching process, competition training process and production process, realized the working of the teaching process, and explored the integration of curriculums and competitions from the teaching process.

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Third, bring new standards and norms into classroom teaching to standardize the training process.

Taking the mobile application development competition as an example, in the teaching implementation stage of the comprehensive training project, we will indirectly strengthen cooperation with industry enterprises through competitions, meet the knowledge, skills and quality requirements required by professional posts, timely incorporate the new standards and specifications of mobile application development into the teaching, and put forward requirements for students to strictly follow the development standards and specifications, requiring them to form a sense of norms, This requirement will be incorporated into the student assessment and evaluation index system to standardize the training process and explore the integration of course competition from industry norms to assessment and evaluation.

Fourth, introduce the professional quality of the events into the classroom to normalize the professional quality.

The similarity between the competition project and the comprehensive training project lies in that the project has a certain scale and a large workload. The competition project has obvious advantages and disadvantages in terms of delivery quality, and the project workload needs to be completed through teamwork. The team cooperation awareness and professional norms of mobile application development competition will be brought into the daily comprehensive training project. In addition to training students' engineering practice ability, design ability and innovation ability of mobile application development in the real project environment of the enterprise, the team cooperation, communication ability, stress resistance, professional norms and other professional qualities will be cultivated to achieve the normalization of professional quality training.

Fifth, realize the embedding of ideological and political elements through international competition and communication

Through international competitions and international exchanges, students can feel the strong power of the country in leading the the Belt and Road, enhance national pride, and realize the embedding of ideological and political elements.

(2) Exploration and innovation of curriculum teaching mode

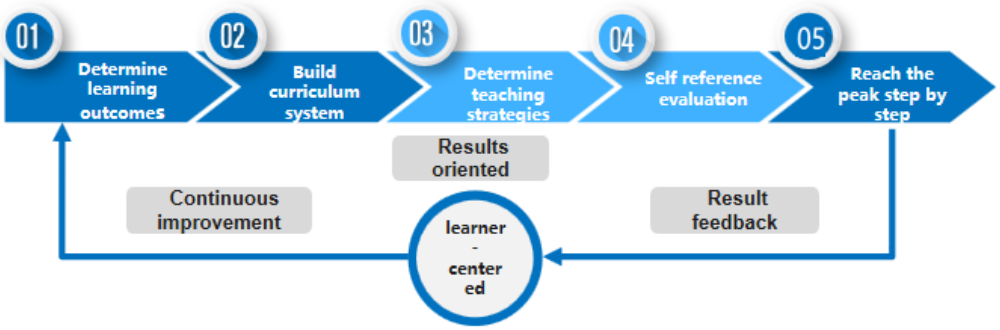

Fig.2 Constructing the curriculum teaching mode with OBE teaching concept

Teaching mode and teaching strategy are the key to improve the effect of classroom teaching. See Fig.2, the OBE teaching concept is used to build the curriculum teaching mode, the OBE teaching concept is used to build the curriculum system, which is result oriented, student-centered, and the way of reverse thinking. The curriculum and teaching design are reverse designed from the final learning achievements (peak achievements).

In terms of teaching strategies, project-based teaching is adopted to simulate the event background of vocational skills competitions to create situations and task driven. Students adopt inquiry learning to explore performance evaluation methods based on learning effectiveness. Multiple and hierarchical evaluation standards are adopted. The evaluation emphasizes the connotation of achieving learning results and personal learning progress, and

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continuously improves curriculum design and teaching based on results feedback, Realize the promotion of the effect of course match integration on talent training.

(3) Development and application of curriculum resources

The curriculum resources are the fundamental guarantee for the implementation of the curriculum teaching. The curriculum resources are developed and enriched by sorting out the competition norms, competition theories, competition projects, competition evaluation and other resources, and applied to teaching. First of all, learn from the concept of vocational skills competition to improve the level of talent training. Second, collect competition projects, add production cases jointly developed with schools and enterprises on weekdays, transform competition projects and production cases into cases suitable for teaching, and enrich the course teaching content; Rely on the teaching information platform to build online courses, develop digital online course resources, and use the teaching platform to publish them to meet the needs of students' ubiquitous learning. Develop "new form loose leaf" teaching materials and work manual teaching materials, and timely write new projects, new technologies and new specifications into loose leaf teaching materials. Through international vocational skills competitions, international new technologies and new ideas can also be incorporated into loose leaf teaching materials.

(4) Professionalization and authenticity of curriculum evaluation

Drawing on the authentic production project evaluation method of the vocational skills contest and the "analytical gauge" evaluation strategy adopted by the contest, the project evaluation details are described in detail and scores are subdivided, and the professional standards and norms involved in the contest are integrated into the daily teaching project teaching and evaluation, so as to standardize and standardize the skills teaching evaluation; The competition evaluation not only evaluates the basic knowledge and skills, but also integrates the requirements of professional ethics, professional quality and so on, reflecting the comprehensive evaluation requirements for students' knowledge and skills, professional quality [6].

4. Results of Practice and Exploration

Through the above exploration and implementation, the research team tried to eliminate the "two skins" of course content and professional posts, classroom teaching and skills competition, and achieve the integration of "curriculums and competitions". Through practice and exploration, the research team has achieved the following implementation results, restructured and optimized the curriculum system, established a comprehensive training project library, and updated the project library in real time by introducing competition projects to realize the authenticity of training projects, the working of teaching process, the standardization of development process, and the routine (cultivation) of professional quality; Based on the engineering teaching, the OBE teaching concept is used to construct the curriculum teaching mode and implement the teaching mode reform; The digital curriculum resources and loose leaf teaching materials have been developed by using the vocational skills contest entries; The students' interest in learning has been greatly improved, the training effect has been significantly improved, and they have won many awards in various skill competitions.

5. Conclusion

The research group deeply analyzed the feasibility of the "integration of curriculums and competitions" to promote the reform of teaching mode and teaching method, and proposed that the "integration of curriculums and competitions" based on the vocational skills competition cultivate highly skilled talents. Taking the mobile application development curriculum system

as an example, relying on the "integration of curriculums and competitions" to promote the reform of curriculum content, mode and method, learn from the vocational skills competition the development trend of the industry and job demand standards, and reconstruct the curriculum system and teaching content, Reform the teaching mode and teaching evaluation, build curriculum teaching resources, promote the authenticity of training projects, the working of teaching process, the standardization of training process, and the normalization of professional quality (training), effectively stimulate students' interest in learning, and improve the quality of talent training and international adaptability.

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About the author: Wu Shuying (1976 -), female, from Yueqing, Zhejiang Province, is an associate professor of Wenzhou Polytichnic College, and vice president of the Artificial Intelligence College of Wenzhou Vocational and Technical College. Her research direction is AI, big data, research on vocational education laws, and research on vocational education informatization construction.

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