

Comprehensive Education Course Based on "Job Course Competition Certificate" Reform Research

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Abstract: "Job Course Competition Certificate" comprehensive education, that is, the comprehensive education of "job position", "course content", "skill competition", and "skill certificate". The thesis is aimed at the important course "Sensors and Detection Technology" of the mechanical major, and carries out the research on the curriculum reform of the comprehensive education of "Job Course Competition Certificate". According to the needs of jobs, skill certificates and student competitions, the content of the course is reconstructed, so as to achieve comprehensive education.

Keywords: Comprehensive education, sensors, "Job Course Competition Certificate", Course reform.

1. Introduction

At the National Vocational Education Conference in 2021, Vice Premier Sun Chunlan of the State Council pointed out that it is necessary to thoroughly implement the important instructions of General Secretary Xi Jinping on vocational education, implement the instructions and requirements of Premier Li Keqiang, adhere to the cultivation of morality, optimize the type positioning, and accelerate the construction of modern vocational education system. It is necessary to integrate the design of vocational education and training systems for secondary vocational, higher vocational and undergraduate vocational education, deepen the reform of "three educations", comprehensively educate people with "Job Course Competition Certificate", and improve the quality of education. It is necessary to improve the diversified school-running pattern, refine the policies of industry-education integration and school-enterprise cooperation, and explore evaluation methods that meet the characteristics of vocational education. All localities and departments should increase safeguards, improve the treatment of technical and skilled personnel, unblock career development channels, and enhance the recognition and attractiveness of vocational education.

According to the school-enterprise cooperation policy, aiming at the job ability needs of enterprises, combined with the needs of regional economic and social development for talents, docking with the machinery manufacturing industry, relying on the mechanical and electrical equipment manufacturing industry in the surrounding areas of the school, for enterprises to be able to engage in intelligent manufacturing system integration equipment installation and adjustment, Maintenance and repair of high-quality technical skills professionals. As one of the core courses for mechanical majors, "Sensor and Detection Technology" mainly trains students to master the basic knowledge of various sensor principles, classifications, characteristics, etc., as well as core technical skills such as type selection, detection, installation and maintenance.

2. The Current Situation of Domestic Research

Various domestic vocational colleges have carried out to

varying degrees the vivid practice of "Job Course Competition Certificate" to cultivate high-skilled talents, gradually improving the education mechanism of combining morality and skill, and combining work and learning; Starting from the demand for compound talents in technical positions, taking typical work projects as the carrier, and building a modular and progressive curriculum system with industry enterprises; integrating the teaching content with the goal of industry certification, skills competition, and literacy requirements, achieving It has achieved remarkable results, improved the quality of skilled personnel training, won social recognition, and has promotion value.

Various colleges and universities are doing the integration between "Job Course Competition Certificate", but most of them only achieve partial integration, such as the "course certificate integration" of Shenzhen Vocational and Technical College, the "competition education integration" of Jinhua Vocational and Technical College, Most of Shandong Vocational College's "combination of competition and certification courses" lacks the integration of positions. Even if there are integration of positions and courses, the actual effect is far from the actual needs of enterprises. The enterprise order class we set up is a post that the enterprise needs, and its demand for skills and positions is particularly prominent. Therefore, this project will take the course of "Sensor and Detection Technology" as an example to explore the comprehensive education of "post-class competition certificate". Research on teaching reform.

3. The Research Content of "Job Course Competition Certificate" Comprehensive Education

3.1. Rebuild the Course

According to the talent training plan, combined with the needs of intelligent manufacturing integrated equipment installation and maintenance positions, students are required to master the application of various sensors, and to cultivate students' ability to correctly use sensors, detect circuit design and installation. According to the characteristics of students in the enterprise order class, the actual intelligent manufacturing production line of the enterprise is used as the carrier, and the original course content based on the sensor category is transformed into a project-based teaching, and the

course system is reconstructed. The course content is closely aligned with the actual needs of enterprises, and the new course content highlights the characteristics of enterprises and is more in line with the needs of the industry.

3.2. Integrate the Certificate

Certificates are industry standards, and the vocational skills certificate system is demand-oriented on job skills, problem-oriented on the mastery of core job skills, and goal-oriented on the cultivation of high-tech skilled personnel. Docking with vocational skills certificates of industry enterprises, improving teaching standards, connecting course content with professional standards, connecting the teaching process with the production process, and integrating the requirements of vocational skills certificates into the course content, so that students can achieve the corresponding sensor requirements while completing the course content. Vocational qualification certificate.

3.3. Join the Competition

In order to make the teaching and the competition more systematically connected, the course will transform the competition project into teaching, design the individual knowledge points and skill points into course projects, and design the comprehensive application into semester projects. Incorporate the industry standards and norms that are understood and applied in guiding competitions into daily teaching and training, standardize and standardize skill teaching, integrate basic requirements such as professional ethics and professional quality into the evaluation system, and increase indicators such as economy and safety. Comprehensive evaluation requirements for students' quality and knowledge ability.

3.4. Improve the Skills

Set course content, design teaching process, and conduct teaching evaluation according to the actual job requirements of the enterprise. The course content is set according to the job skill standards of the enterprise; based on the job skill requirements of the enterprise, the practice teaching process is designed according to the progressive law of basic skills, core skills and comprehensive skills; based on the job practice, the job practice instruction manual and teaching are compiled according to the staged practice requirements. evaluation standard.

4. The Teaching Strategies of "Job Course Competition Certificate" Comprehensive Education

According to the research objectives and research content, formulate a research plan: use the characteristics of students' positions in the enterprise, adopt different grouping strategies, enable students to exert their expertise and complement each other; use advanced digital twin technology to solve the teaching difficulties of enterprise practice projects; use The comprehensive evaluation system of "'Job Course Competition Certificate" reflects the job needs of the enterprise.

4.1. Rational Use of Grouping Strategies

Use job groupings to address knowledge and applications of a single sensor. Based on the learning situation, the students are divided into groups according to their positions. Each

group is composed of a single type of work and learns according to the characteristics of the positions. The group adopts the form of advanced and backward to enhance the learning confidence of individual group members and achieve common progress, so that each student can master the application of various sensors in simple institutions.

Use project grouping to complete the application of comprehensive practical engineering projects. The project grouping disrupts the original post grouping mode. According to the age difference of the students and the students' previous basic content learning situation, simulating the situation of the actual project team of the enterprise, the mixed grouping of work types is carried out. Each group includes management, technology, craftsmanship and business personnel. All aspects of the group are average. The team members gave full play to their respective positions, worked collaboratively, and mastered the comprehensive application of various sensors in smart devices.

4.2. Employ Digital Twin Technology

Adopt digital twin technology to feed back real-time information from sensors on the production line. Due to the limited number of actual production lines in the enterprise, and the production lines are in normal production state, which cannot fully meet the teaching needs, digital twin technology is used, one machine per person, to simulate the real-time situation of the production line of the enterprise, and achieve the effect that is completely consistent with the actual equipment.

4.3. Utilize the "Job Course Competition Certificate" evaluation system

Work with enterprises to formulate a comprehensive evaluation system of "Job Course Competition Certificate", and evaluate students in the whole process in combination with school curriculum evaluation, vocational skill certificate evaluation, competition project evaluation and enterprise post salary grading evaluation. To enable students to complete the course objectives, meet the requirements of vocational skills grade certificates, reach the level of competition projects, improve job competitiveness, fully reflect the needs of corporate jobs, and achieve sustainable career development.

5. The Teaching Effect of "Job Course Competition Certificate" Comprehensive Education

After the study of the reformed "Sensor and Detection Technology" course, the "class-certificate-competition-post" evaluation system is used to evaluate the whole process of the students in the enterprise class. Goals are effectively achieved.

5.1. Improve the Theoretical Knowledge of the Course

The use of the course content evaluation in the "Job Course Competition Certificate" evaluation system to evaluate the students' learning situation shows that all students can basically master the basic principles and classification of various sensors, and through the comparison and analysis of the pre-test scores and post-test scores The results show that the students' mastery of the theoretical knowledge of sensors has been greatly improved.

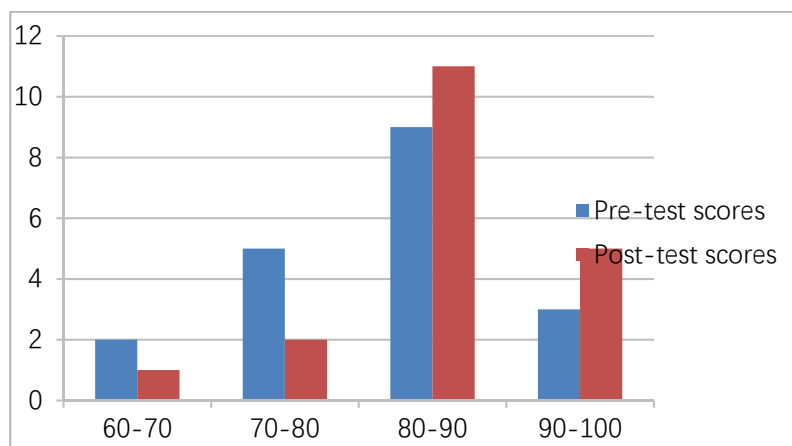


Figure 1. Comparison of pre-test scores and post-test scores

5.2. Improve Students' Practical Ability

Using the certificate skill evaluation in the "Job Course Competition Certificate" evaluation system to conduct statistics on students' learning, it is shown that students in different positions can basically master the selection, wiring and application of sensors, and their technical abilities related to sensors have been improved. And students in different positions have shown different learning effects in combination with their positions: the students in the technical

group have outstanding performance in scheme design and professional knowledge, can design better schemes and have a high degree of completion; Complete the training tasks in a more standardized way; the students in the business group have outstanding performance in terms of expression ability, can fully consider the cost-effectiveness in the selection of models, and can better express the ideas of the group; the management group has outstanding performance in teamwork and can give full play to the group. The advantages of each member.

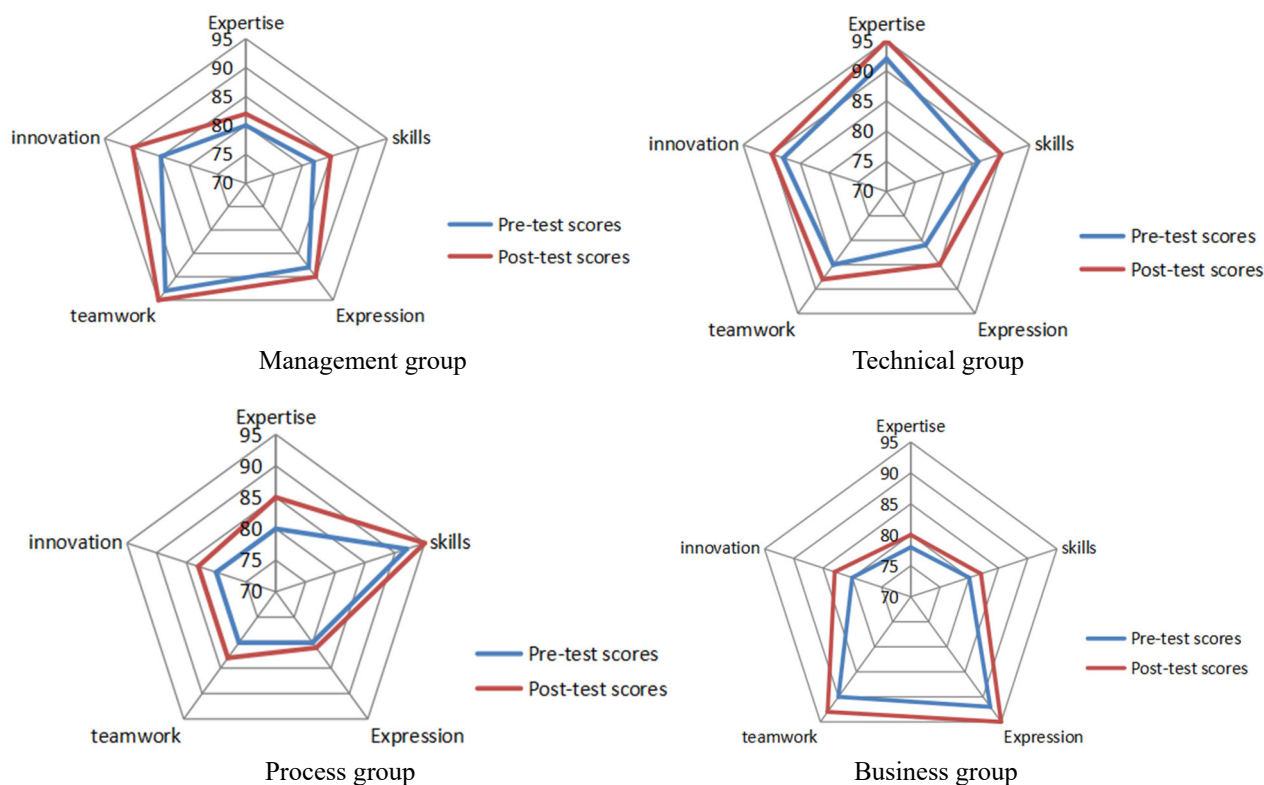


Figure 2. Scores for each position group

5.3. Improve Practical Application Level

Using the certificate skill evaluation in the "Job Course Competition Certificate" evaluation system to conduct statistics on the students' learning situation, it is shown that: after grouping the projects, each group includes, on average,

management, technology, craftsmanship, and business personnel, and the team members give full play to their respective post specialties. Collaborative work can better complete the application of sensors in intelligent logistics, and improve the ability to meet the needs of enterprise projects.

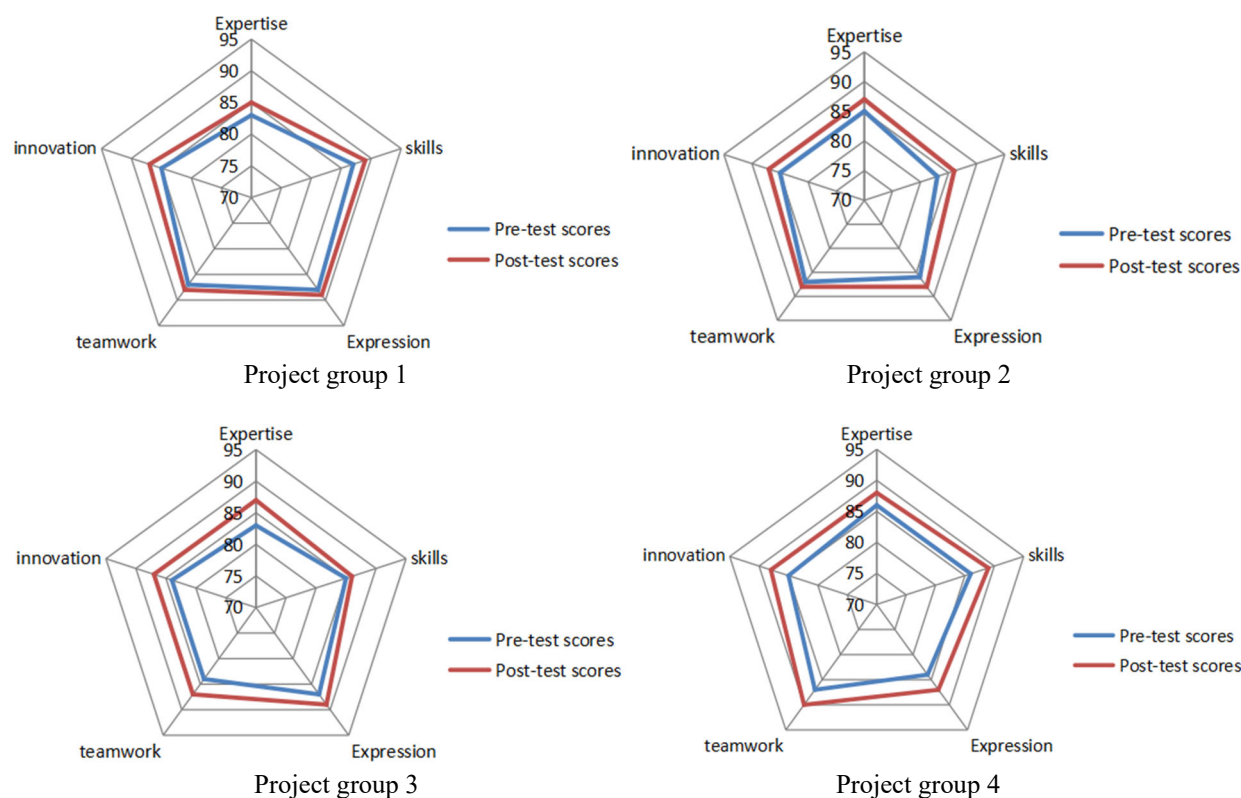


Figure 3. Scores for each project group

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