

# Research and Practice of Teacher-Student Competition Training Mode based on "Big Data Application Development" Vocational Skill Competition

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## ABSTRACT

The purpose of this study is to explore and practice the teacher-student training model based on the vocational skills competition "Big Data Application Development". The article firstly emphasizes the importance of the national attention to vocational education and the reform of related teacher team building to improve the quality of vocational education, and points out the key role of vocational skills competitions in cultivating the professional skills of young teachers. By analyzing the organizational structure and impact of the National Vocational College Skills Competition, it highlights the importance of the competition in leading educational reform and improving the quality of technical and skilled personnel training. The innovation and change of the domestic vocational education model are discussed in depth, with special emphasis on the new ideas provided by the model of teachers and students competing together for education reform. In terms of the implementation path, strategies such as analyzing the types of competitions, dissecting the competition syllabus, customizing the training path, sharing experiences and converting competition results are proposed. Finally, the article summarizes the practical experience of the teacher-student competition model in the cultivation of skilled talents, showing the positive impact of this model on improving teachers' vocational skill level and guiding students' competition ability, as well as its important role in improving the cultivation level of vocational skilled talents.

## KEYWORDS

Big Data Application Development; Skills Competition; Teacher-Student Competition; Training Model.

## 1. INTRODUCTION

In order to implement the Vocational Education Law of the People's Republic of China [1] and the Opinions on Comprehensively Deepening the Reform of Teacher Team Construction in the New Era [2], the important action measures to boost the high-quality development of vocational education require the comprehensive development of higher education teachers to enhance the training, focusing on the new teachers and young teachers have become the main force of talent training in China's colleges and universities, and the ability to enhance the capacity of young teachers is very important as a One of the most important ways to improve the ability of young teachers is the vocational skills competition [3].

The National Skills Competition for Vocational Colleges and Universities, initiated and led by the Ministry of Education, is a public welfare, nationwide comprehensive skills competition for students of vocational colleges and universities jointly organized by the relevant departments of the State Council, as well as the relevant industries, people's organizations, academic groups and localities; it

is a major institutional design and innovation of China's vocational education and plays an important role in leading the reform of the three teachings, improving the quality of cultivation of technically skilled talents, promoting high-quality employment, serving the economic and social development, and facilitating exchanges and cooperation between Chinese and foreign vocational education. It has played an important role in leading the reform of the three education systems, improving the quality of training technical and skilled personnel, promoting high-quality employment, serving economic and social development, and facilitating exchanges and cooperation between Chinese and foreign vocational education.

The organizing committee of the National Vocational College Skills Competition, on the basis of in-depth sorting and summarizing the experience of holding past National Vocational Skills Competitions, strives to find innovations and breakthroughs in the event, and adopts a brand-new competition model. In the "Notice of the Ministry of Education on the Holding of the National Vocational College Skills Competition of 2023"[4] document released in May 2023, a total of 134 competitions were set up. Among them, 42 competitions in the intermediate group, 92 competitions in the higher vocational group, 14 competitions in the pilot teacher competition, and 16 competitions in the teacher-student competition. This is also the first time in the vocational skills competition in the teacher competition and teachers and students with the competition, the emergence of new skills competition type, not only vividly demonstrates the development trend of China's vocational education in the new era and vigorous vitality, but also for the vocational education will continue to innovate and progress to lay a solid foundation. [5].

Among the 92 senior vocational competitions, they are divided into 19 categories. Among them, under the category of electronics and information, there are three competitions for teachers and students, namely "big data application development", "industrial Internet integration application" and "intelligent electronic product design and development". The competition is organized by the same program for teachers and students. At present, with the rapid development of technology, the market for electronic and information technology in the field of professional skills of the growing thirst for talent. Continuously cultivating talents with high-level professional skills is a key and urgent development direction in the field of vocational education.

## **2. CURRENT STATUS OF RESEARCH**

### **2.1. Domestic Vocational Education Model**

Domestic vocational education is undergoing innovation and change, and is constantly exploring educational models that meet the needs of the new era. For example, the "integration of industry and education" innovates the new mode of "three teaching reforms" of vocational colleges and universities, which is "combination of work and study, school-enterprise cooperation, and top-grade internship" [6], and promotes students' learning in practice and learning in practice. With the "Post-Course-Competition-Certificate" integration model of education [7], the competition certificate is integrated into the education program, curriculum system and teaching evaluation, to promote the quality of the course content and deepen the ability of students. The mode of "promoting teaching by competition, learning by competition, building by competition, and integrating by competition" [8] stimulates students' learning enthusiasm and teachers' teaching innovation, and realizes the organic combination of teaching and competition, which is also an important form of education in vocational education.

In order to further promote the development of vocational education and build a three-tier linkage system of skills competitions for teachers and students at the provincial, municipal and school levels, we have been actively exploring and practicing the "Post-Course-Competition-Certificate" model of integrating education in strict compliance with the national education norms, and in accordance with the requirements of the talent training program, teaching standards and core curriculum. At the same time, we continue to innovate and optimize online and offline hybrid teaching methods to ensure that

the educational content and teaching methods keep pace with the times and meet the new requirements of social and economic development.

## 2.2. Challenge and Opportunity

In current vocational education, there are multiple educational models combined, all of which are aimed at exploring the cultivation of high-quality and high-skilled vocational talents. The educational model of "promoting teaching by competition, learning by competition, building by competition, and integrating by competition" proposed in the early years is mainly based on teachers guiding students in learning, training, and participating in competitions. However, there are few teachers who directly participate in vocational skills competitions, and few scenarios where teachers and students form teams to participate in learning, training, and competitions. In 2023, the national vocational skills competitions released by the Ministry of Education specifically added teacher competitions and teacher-student competitions.

These initiatives provide a new direction for the study of the model of "promoting teaching by competition, learning by competition, building by competition, and integrating by competition", pointing out a new direction for the development of vocational education, emphasizing the practical and interactive nature of education, and providing strong support for the cultivation of high-quality technical and skilled personnel needed in the new era.

## 3. THE IMPLEMENTATION PATH OF THE TEACHER-STUDENT COMPETITIVE PARENTING MODEL

### 3.1. Analyzing Types of Vocational Skills Competitions

Among the newly released vocational skills competitions, three main forms of competition are included. Teachers' Skills Competition, with young teachers as the target group, actively encourages teachers to participate in skills competitions to improve their professional skills and teaching abilities, thereby promoting the overall improvement of education quality. Student Skills Competition, as a practical platform to stimulate students' innovative spirit and practical ability, promotes students' overall growth in professional skills and personal qualities, and lays a solid foundation for their future career. Teachers and students competing together, this innovative competition system provides teachers and students with the opportunity to grow together, strengthens the communication between teachers and students through actual participation and collaboration, and realizes the teaching concept of combining theory and practice.

### 3.2. Analyzing the "Big Data Application Development" Competition Syllabus

**Table 1.** Correspondence between competition content and course knowledge

Contest Content	Course Knowledge
Big data platform construction (container environment)	Linux basics, Docker container technology
Offline data processing	Big data platform operation and maintenance basics, offline computing
Data mining	Machine learning related models
Data collection and real-time computing	Big data platform operation and maintenance practice, distributed, real-time computing
Data visualization	WEB front-end technology, ECharts components, etc.
Comprehensive analysis	Throughout the whole process of professional talent training, with logical analysis ability
Professionalism	Character education, Civics program, curriculum Civics-related

Analyze the correspondence between the contents of the 7 modules of the "Big Data Application Development" competition and the curriculum, and clarify the knowledge and skill points. According to the correspondence between the contents of the "Big Data Application Development" vocational skills competition and the curriculum, practical training cases are integrated into the teaching process of the curriculum, as shown in Table 1.

### **3.3. Customize a Reasonable Training Path for Teachers and Students in the Same Competition**

In the process of preparing for vocational skills competitions, there are differences in the degree of mastery of the knowledge points of the competitions by teachers and students, which brings challenges to the implementation of modularized training, integrated training and intensive training. At the same time, there are also differences in the understanding of new technologies in the competition. Therefore, according to the vocational skills competition "big data application development" and the participating teachers and students' mastery of the modules and knowledge points, it is necessary to formulate a personalized training plan based on the competition syllabus as the standard and the competition questions.

In order to ensure the systematic and effective training for the competition, a targeted training plan is formulated based on the content of the competition in a module-by-module, degree-by-degree, role-by-role manner. Through this training program to consolidate old knowledge, improve new skills, skilled competition process, to achieve the effect of gradual progress. In terms of the whole process of technology, it can be based on basic knowledge training, integration training and comprehensive testing. In terms of vocational skill points, intensive training sessions can be carried out from the perspectives of knowledge training and modularized training. In terms of experience accumulation, it can be independent learning, group learning, technical salon and other growth sessions. Through the implementation of these strategies, it can effectively realize the tailor-made teaching and ensure that each participant can play the best level in the competition.

### **3.4. Teacher Competition, Student Competition and Teacher-Student Competition Experience Sharing**

In the process of organizing, learning, training and competing with teachers and students in the same competition, how to abstract the experience in each section and how to share the existing summarized experience. At the same time, it is also necessary to consider the mastery of teachers and students in experience sharing, which requires a fixed set of abstraction and efficient sharing model.

Based on the existing experience of participating in teacher competitions and guiding students to participate in competitions. Combine the whole process of the competition, including: competition application, venue arrangement, content division, program development, knowledge point teaching, skill point reinforcement, as well as integrated training and experience sharing. Summarize, precipitate and share the existing experience of similar teacher-student competitions, and rapidly construct a new competition training mode.

### **3.5. Competition and Course Grade Conversion**

The formulation of rules for the replacement of vocational skills competition results with course grades is an important measure for realizing the combination of theory and practice in the education system and the mutual complementarity between competition results and course learning. First of all, it is necessary to establish a set of clear replacement standards and procedures, stipulating the correspondence between vocational skills competitions and replacement course grades, as well as the specific proportion and conditions of replacement. The replacement rules can provide incentives and recognition for students who perform well in vocational skills competitions, and enhance their

learning motivation and professional confidence. Through these measures, it can ensure the effective implementation of the rules for the replacement of vocational skills competition results with course grades, realize the deep integration of the competition and the curriculum, and promote the improvement of students' comprehensive quality and vocational skills.

## 4. CONCLUSION

Through in-depth analysis and practical exploration, this study draws conclusions about the model of teacher-student co-competitive parenting in vocational skills competitions. First, the study clarifies the positive impact of national policies on vocational education, especially the importance attached to teacher team building, which provides a solid foundation for the professional growth of young teachers. Vocational skills competitions, as an important platform for improving the professional skills of young teachers, play a key role in improving the quality of education.

Through the analysis of the organizational structure and impact of the National Vocational College Skills Competition, the study highlights the central role of the competition in promoting educational reform and improving the quality of technical and skilled personnel training. At the same time, the study points out that domestic vocational education is currently undergoing innovation and change, exploring an educational model adapted to the needs of the new era, and the model of teacher-student competitions provides new ideas and directions for educational reform. A series of practical research is carried out to ensure the normal promotion of the teacher-student competition model of education.

The study also summarizes the practical experience of the teacher-student competition model in the cultivation of skilled personnel, demonstrating the positive impact of this model on the improvement of teachers' professional skills and their ability to guide students in competitions. Through this model, teachers and students are able to participate in the competition together, which not only improves their professional skills, but also enhances their teamwork and problem-solving abilities.

Finally, the study concluded that the model of teachers and students competing together to educate people can effectively improve the level of vocational skills training, and provide strong support for the cultivation of high-quality technical and skilled personnel needed in the new era. The implementation of this model is of great significance and value in promoting the development of vocational education and improving the quality of education. Through this study, we can see that the model of teachers and students competing in the same competition to educate people is not only an educational innovation, but also an educational practice, which can closely combine theory and practice, provide a platform for students to show their abilities and learning achievements, and also provide an opportunity for teachers to improve their teaching ability and professional skills.

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