The Application of Huffman Coding Thinking in The Selection of Vocational Education Skills Competition

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Abstract

Vocational education in the new era is gradually entering a stage of high-quality development. The social influence of skill competitions is growing, and it has become a bright brand of national vocational education. The skills competition has a guiding, benchmarking and catalytic effect on vocational education. Therefore, innovating the operation mechanism of the intra-school skills competition and improving the benchmarking role of the contestants can accelerate the connotation construction of students and improve the quality of vocational education. The author regards the selection of students in the competition as a coding problem, using Huffman coding thinking, through designing coding, trying to find the most effective coding, that is, selecting the best students in the shortest time, and improving the selection mechanism of students in the skill competition. quality.

Keywords: *skills competition; Huffman coding; innovation*

1 INTRODUCTION

In January 2019, the State Council issued the "National Vocational Education Reform Implementation Plan" stating: "Vocational education and general education are two different types of education and have equal importance." General education has college entrance examinations, and vocational education has competitions.[1] Skill competition is an important means to achieve the goal of training skilled talents and a booster for the reform of vocational colleges. Through the skills competition of vocational colleges, it can improve the enthusiasm of teachers and students in vocational colleges to study and learn vocational skills, and highlight the importance of professional skills in vocational colleges. position in education. In order to better grasp the development context of the selection mechanism of skill competitions, this paper studies and analyzes the selection mechanism of vocational education competitions in my country in recent years, in order to explore the trends and trends of the selection mechanism of vocational education competitions, summarize the development experience, and provide the selection mechanism for competitions in the new era. Development provides corresponding reference. The theoretical characteristics and application of "Information Theory and Coding" are analyzed in the training process of computer application talents.

Combined with practice, the selection method, coding method and assessment of the competition are started from three aspects, and the innovative operation mechanism of quantitative skills competition selection is proposed.

2 PROBLEMS EXISTING IN THE OPERATION MECHANISM OF THE SKILLS COMPETITION

Vocational education was launched relatively late in China, and skill competitions were launched on a large scale after 2008. Looking at the existing literature, we found that the current research on skills competitions by scholars mainly focuses on skills competitions to promote professional talent training and professional course teaching. problem. [2] Research on optimization countermeasures is often "on the spot", only from a certain level, a certain category, and certain regions, and the results of systematically optimizing the selection mechanism of innovation competitions are still very few. Based on the research on the current situation, this paper sorts out the experience and achievements of the operation mechanism of the skills competition, which is mainly based on the literature method and supplemented by the survey method. Selection and optimization of countermeasures, in order to play a good role in promoting the skills competition. The research on the

operation mechanism of the existing skill competition is all qualitative analysis. According to Shannon's first law, information can be quantified, and the minimum length of the encoding is the information entropy of Chinese characters, which means that any input cannot break through the given information entropy. First of all, this paper will code the student selection mechanism of the operation mechanism of the skill competition, analyze quantitatively, find the information entropy of this code, and select the best students in the shortest time [3].

3 PRACTICE AND INNOVATIVE EXPLORATION OF SKILLS COMPETITION BASED ON HUFFMAN CODING THINKING

To cultivate first-class technicians requires first-class skills teaching, not only limited to domestic first-class, but also world-class. We must always pay attention to the trend of the WorldSkills Competition and connect it with the world vocational teaching concept, model and goal. Build a vocational skills competition mechanism integrating enterprises; build an open mechanism for skill competitions in vocational and technical colleges; build a teacher-enterprise training system [4]. There is also a need for the selection mechanism of the innovation skills competition. The innovation mechanism of the competition can be regarded as an IT problem. This problem needs to be quantified. The unit of information quantification is called information entropy. Many IT problems are coding problems, as long as the coding design is clever enough. , the shortest encoding information entropy can be found. Shannon's first law: the encoding length is greater than or equal to the information entropy/the amount of information of each code, the above equal sign is established. Huffman Coder Shannon's first law has to continue. Shannon's first law says that the code length has a theoretical minimum value.[5] It can be mathematically proved that Huffman code is optimal. In essence, Huffman coding is to give the most valuable resource (the shortest code) to the information with the highest probability of occurrence. The principle of Huffman coding resource allocation is that the length of a piece of information coding is proportional to the logarithm of the probability of occurrence. According to the Huffman coding principle, the coding design of the student selection mechanism of our department's network competition is designed. The first round of training Linux network operating system, computer network foundation; the second stage TCP/IP protocol, windows operating system, network infrastructure, computer application foundation, python foundation; the third stage TCP/IP protocol, network infrastructure, Linux network Operating system, python foundation can choose network system management and artificial intelligence; computer network foundation, computer application foundation can choose HTML5; computer network foundation, Linux network operating system, TCP/IP protocol can learn cloud computing, Linux network operating system, TCP/ IP protocol, python foundation, windows operating system, PHP programming foundation can learn network security.

4 TAKE OUR DEPARTMENT'S NETWORK COMPETITION AS AN EXAMPLE TO CONDUCT VISUAL ANALYSIS

Taking our department's online competition as an example, the problem we want to solve is to select the students with the best conditions in each competition from the freshmen in the shortest time, and then carry out professional training. The author uses Huffman coding to optimize the selection of students. Starting from October 2019, 300 freshmen of grade 19 will be trained in the first phase of Linux network operating system for one month, and the basics of computer network will be trained. 150 students will be selected to enter the second stage, and will be trained for three months on TCP/IP protocol, windows operating system, network infrastructure, computer application foundation, and python foundation. 75 students were selected to enter the third stage of sub-competition study, namely network system management, network security, cloud computing, HTML5, artificial intelligence and 5G network construction technology. The training and learning situation of each competition is shown in the table below.

Table 1 Selection of the 19th grade freshman competition

training period	Training Courses	Number of people trained	Number of people selected	event
October 2019 to November 2019	Linux Network Operating System Basics of Computer Networking	300 people	150 people	
November 2019 to February 2020	TCP/IP protocol, windows operating system, network infrastructure, computer application foundation	150 people	75 people	
February 2020 to present	Network Infrastructure, Linux Network Operating System, Python Basics	15 people		network system management
February 2020 to present	Linux network operating system, python basics, ros (robot operating system)	10 people		artificial intelligence
February 2020 to present	Computer network foundation, computer application foundation, H5 content production, H5 fusion media page development	10 people		HTML5
February 2020 to present	Computer Network Fundamentals, Linux Network Operating System, TCP/IP Protocol	10 people		cloud computing
February 2020 to present	Linux network operating system, TCP/IP protocol, python foundation, windows operating system, PHP programming foundation	15 people		cyber security

Due to various reasons, a small number of students in each competition withdrew from the training team during the training. The current number of student teams in each competition and their awards are shown in the table below.

Table 2 Analysis of the conditions of each competition of the 19th grade students

Competition items	instructor	Student number	training period	Awards
network system management	2 network majors	12 people		Two provincial third prizes, one second prize and one first prize from 2019 to 2021
cyber security	2 persons engaged in safety teaching	12 people		Two third prizes from 2020 to 2021
cloud computing	Network major 2 part-time	6 people		Two provincial third prizes from 2019 to 2021
HTML5	Network major 2 part-time	5 people		none

artificial intelligence	2 in artificial intelligence	8 people		One third prize from 2020 to 2021
5G network construction technology	Network major 2 part-time	8 people		One first prize in 2021
Computer Programmer (Mobile App Development)	Network major 2 part-time			One third prize in 2021

5 CONCLUSION

Education is influence, education is awakening, education is kindling. The National Vocational Education Conference clearly pointed out that it is necessary to promote the comprehensive education of "post-class competition certificate integration" and improve the quality of education. The skill competition is a touchstone. Vocational schools have effectively promoted the cultivation of students' vocational skills through multi-level skill competitions. However, there are many factors that affect the performance of the competition. The author believes that the selection and training of the contestants determines the quality of the competition. key factor. Through the visual analysis of our department's online competition process evaluation and student interviews, it is found that using Huffman coding to select contestants can more scientifically and effectively exert students' potential and advantages. Future: First, optimize the application of innovative Huffman coding in the selection of contestants, and realize the combination and repeated verification of theory and practice. The second is to summarize the experience and lessons of students' training, and further optimize the knowledge and skills of the entire training process. The third is to create a talent training model in the new era in which competitions lead teaching and model vocational education based on the development expectations that skills will change life.[6]

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