

Modeling and Simulation Analysis of Digital Standardization Transformation Teaching Organization and Management System

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Abstract: With the comprehensive development of the "Double High Plan" construction in higher vocational colleges, teaching organization management plays an important role in promoting the high-quality development of higher vocational education. However, there are inevitably problems in higher vocational colleges that the teaching management system is not perfect and the teaching management operation mechanism is not optimized enough, which hinders the high-quality development of higher vocational colleges to a certain extent. In order to better solve the above problems, this paper proposes a new teaching organization and management system, guided by constructivism and multimedia learning cognition theory, through the digitalization and intelligent innovation of the teaching organization and management system, in order to further optimize resource allocation, Improve governance capabilities.

Keywords: Double high plan; Management system; Constructivism; Resource allocation.

1. Introduction

Improving teaching and research ability is one of the most important assets that qualified teachers should possess, and it is an important position for teachers to improve their teaching level and teaching quality. Ordinary students have insufficient learning and research ability, so the teaching level of ordinary students improves slowly after entering the workplace, and it is difficult to adapt to the development stage of the core curriculum reform. The new stage of basic education reform has raised new problems in many aspects, such as curriculum regulation, curriculum purpose, curriculum content, and curriculum penetration concept. The new requirements not only require the majority of teachers to combine exploration and collaborative efforts in teaching practice, but also require improving the teaching and research level of these teachers[1-2].

In the modeling and simulation analysis research on the transformation of teaching organization and management system based on digital standardization, many scholars have studied it and achieved good results. For example: Mamatova M [3] put forward: implement teaching according to the professional, and advocate the teaching method of "individualized, dialectical, seminar and interactive". This paper firstly collects literature on teaching reform, briefly introduces teaching organization and management and high-performance computing, and explores relevant research content at home and abroad. Secondly, this paper analyzes the current situation of the cultivation of teaching reform ability, analyzes the deficiencies and defects of the existing teaching reform ability, and analyzes the reasons for the deficiencies and how to make up for the deficiencies. This paper analyzes the application of teaching organization management and high-performance computing related technologies in the modeling of teaching reform ability training, constructs related modeling and conducts simulation analysis, improves the ability training modeling on this basis, and conducts modeling and simulation analysis through experiments[5-8].

2. Specific construction content

2.1 Teaching management system innovation

2.1.1 Establish a three-level flat organizational structure with the college as the main body, the school, the college, and the department (department)

Taking the college as the main body, in the three-level organizational structure of the school, the college, and the department (department), the school is engaged in the development strategy research that is related to the overall situation, formulates the school development strategy, supervises and evaluates the performance of the college, and each college forms a relatively independent entity. , is endowed with relatively sufficient control rights over people, finances and materials, actively expands external contacts according to the needs of teaching and scientific research, and responds quickly to various needs and changes of social development. This flat organizational system reduces hierarchical management, shifts the focus of management downward, and clarifies the responsibilities, rights, and interests of the three-level teaching management organization of schools, colleges, and departments. The management model of "two-way development of scientific research" is shown in Fig. 1.

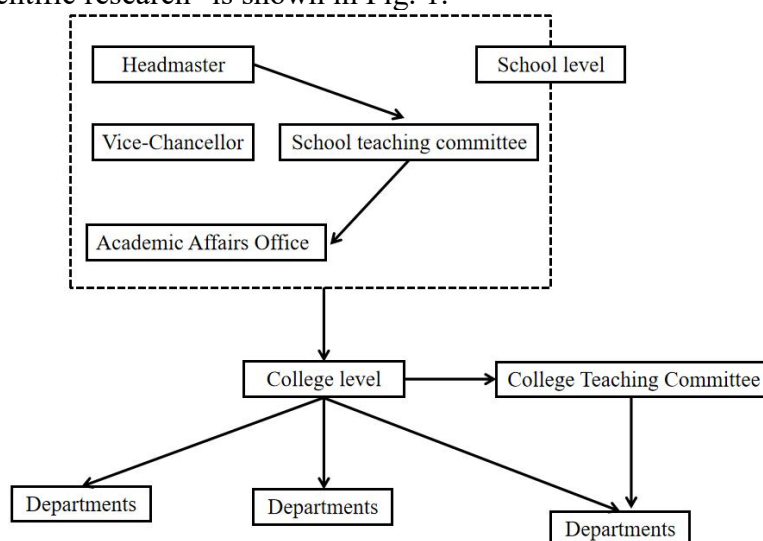


Fig. 1 Teaching organization and management mode

2.1.2 Optimize the flat organizational structure with the group building institute to improve the efficiency of professional groups responding to the industry

Strengthen the linkage with the group building, and clarify the powers at the two levels of the school. Since 2019, the school has begun to build a "high-level" professional group of "soft business hard work, cold chain warm heart". Digital transformation "doing excellent" business circulation services, creating a national-level professional group for marketing (soft business); supporting "doing fine" information technology in business and trade circulation, creating a national-level professional group for cloud computing technology application (hard doing); rooting in agricultural products Expand "cold chain logistics", and create a provincial-level professional group (cold chain) for smart cold-chain logistics; ensure food safety "strengthen" testing technology, and create a provincial-level professional group (warm heart) for food cold chain quality control. The experience of the four high-level professional group models radiates to other professional groups in the school, forming a high-tech service industry "543" professional cluster with the goal of serving "modern service industry, assisting high-end manufacturing and modern agriculture". In 2021, the institutional reform will set up 12 faculties and departments according to the layout of professional groups. The faculties and departments will focus more on the industry and form a flat management organization with rapid response at the two levels of schools and colleges (departments) that accurately connect with the industry, as shown in Table 1.

Table 1. Faculty and Department Names

| | |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Academy of Marxism | Department of Digital Marketing(School of Industry) |
| Department of Cloud Computing Technology and Application (School of Industry) | Department of Smart Finance(School of Industry) |
| Department of Rural Development (Industry College) | Cold Chain Logistics and Supply Chain Department(School of Industry) |
| Department of Food Industry(Industry College) | Department of Modern Finance(School of Industry) |
| Department of Health and Pensions (Industrial College) | Department of Culture and Creativity(School of Industry) |
| Department of Business Administration | Department of Information Technology |
| Department of Applied Electronics | Basic Course Teaching Department (Language and Character Office) |

The school is engaged in the research on the development strategy that is related to the overall situation, formulates the development strategy of the school and the development direction of each department, the professional construction standards and the overall system of the talent training plan, etc., supervises and evaluates the performance of the school, and each department forms a relatively independent rapid response , actively expand external contacts, strengthen the corresponding relationship with the industry and the speed of response.

A professor committee of the teaching committee was established to improve the management system of professors' academic organization. At the school level, a school council, including outstanding figures from the government, industry, enterprises, alumni, etc., has been established, and a teaching committee and a teaching supervision committee have been established; faculties have established a professor committee and a professional construction steering committee.

2.2 Innovation of Teaching Management Operation Mechanism

Adopting a scientific and reasonable incentive mechanism with win-win quality and efficiency will greatly activate the effectiveness of teaching management. Make full use of the teaching management system, break through the barriers of teaching and evaluation systems, build a combination of incentives and constraints, establish an incentive and coordination mechanism suitable for the evaluation system, and form a three-in-one teaching management and evaluation system of "student learning, teaching interaction, and teaching management" , to monitor the whole process of teaching, to implement the full evaluation of students, colleges and universities two-level teaching supervision, peer teachers and leaders to realize the change of management method.

The evaluation indicators of teaching quality include teaching and educating people, teaching content, teaching methods, teaching organization, teaching students in accordance with their aptitude, and teaching effects. The results of teaching evaluation are linked to teaching post allowances, and excellent teaching is given excellent remuneration; teaching quality is included in job review, teaching post appointment, business training, and merit evaluation, and teaching quality is one-vote veto. The innovation mechanism of educational organization management is shown in Fig. 2.

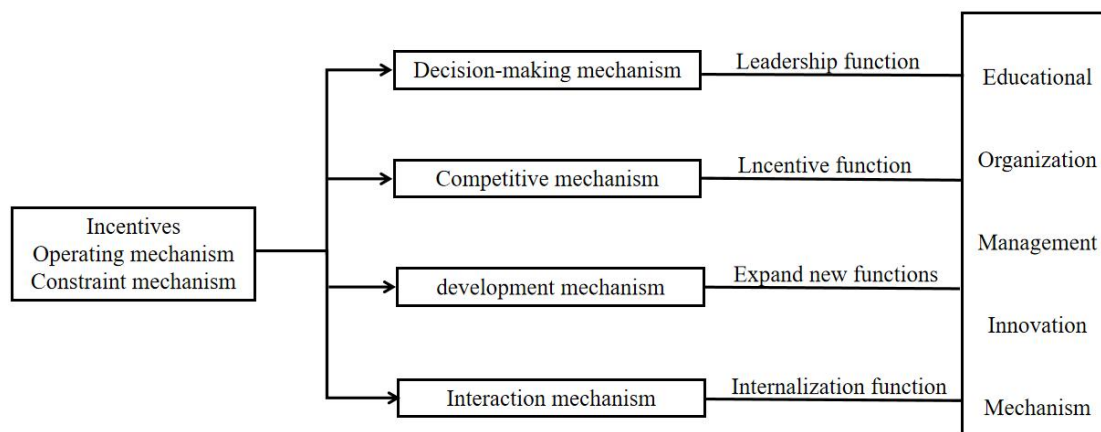


Fig. 2 Educational organization management innovation mechanism

2.3 Constructing the Comprehensive Evaluation System of Students' All-round Quality

Based on the talent training goal of "taking students as the center and cultivating students' innovation as the core", a personalized and hierarchical student comprehensive quality evaluation system is constructed, and an all-round evaluation of students' quality development is carried out.

The content of the evaluation system consists of 19 elements in five aspects: ideological and moral quality, physical and mental health, academic development, professional quality, and innovation and entrepreneurship. In the evaluation process, emphasis is placed on the combination of qualitative and quantitative, process and results, and usual performance and academic year evaluation. Establish an incentive and warning mechanism, and set up scholarships for students who have developed in an all-round way in the five modules, which will also serve as the basis for evaluating the merits and promoting the party to join the party. For students who do not pass the evaluation results, an early warning is given and rectification is made. The comprehensive quality evaluation system of college students is shown in Fig. 3.

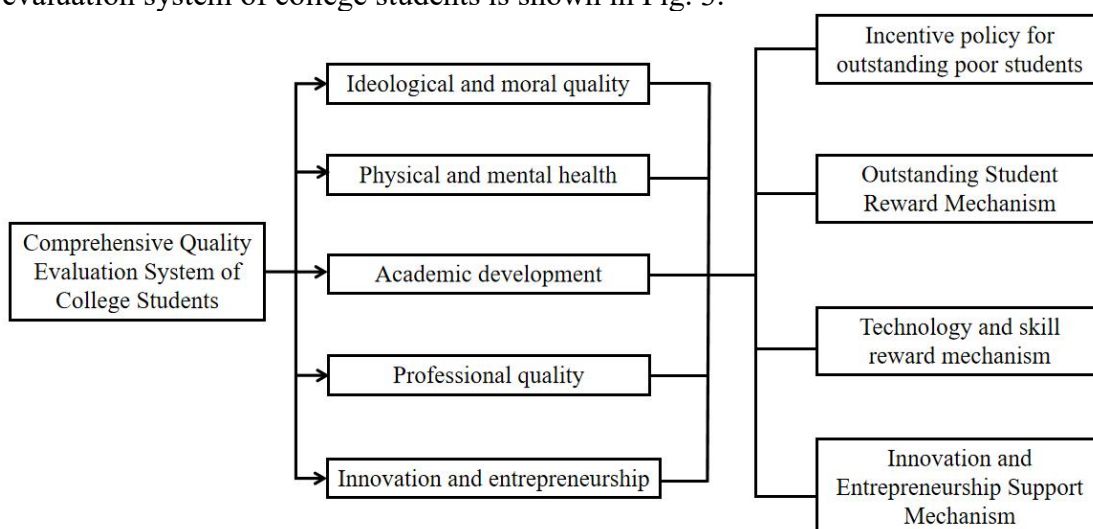


Fig. 3 The comprehensive quality evaluation system of college students

2.4 Improve the chain-type digital information system to stimulate the efficiency of teaching organization and management

The teaching management information system is the basic platform for teaching management and operation, and it is also the first information platform put into operation by schools, but it lacks effective breakthroughs in data sorting, data cleaning and data presentation. On the basis of the newly purchased teaching operation management system in 2018, the school has updated and upgraded the system for three consecutive years. At the same time, with this system as the central node, it has established a professional construction evaluation system, an examination management

system, an online teaching and teaching and research preparation platform. , experimental training intelligent management system, student comprehensive evaluation and second classroom system, student course selection system, teaching evaluation system and more than 10 digital platforms. The generated teaching data can be output, can be used, can be evaluated, and can be warned, so that the data output can be "visible", and the data prediction can "talk", which effectively stimulates the efficiency of teaching operation and management.

3. Algorithm modeling and simulation analysis

The four components of the relevant teaching organization management model constructed in this paper are:

- (1) Teaching management system component S_t .
- (2) Component B of teaching management operation mechanism $I_{p,t}$.
- (3) The comprehensive evaluation component C of students' overall quality $\phi(I_t)$.
- (4) Chain digital information component $\varphi(I_{t-1})$.

Combining the above four components, the calculation formula (1) of the current teaching organization management intensity are given:

$$I_t = S_t + I_{p,t} + \phi(I_t) + \varphi(I_{t-1}) \quad (1)$$

The formula of teaching organization management strength provides specific method support for the next management update and the reasoning decision of the agent under the influence of the organization. The agent is shown in formula (2).

$$E_t = (e_1, e_2, \dots, e_{i,t}, \dots, e_{n,t}) = (f(I_{e1,t}, \omega_1), \dots, f(I_{ei,t}, \omega_t), \dots, f(I_{en,t}, \omega_n)) \quad (2)$$

4. High performance execution time

This paper demonstrates the effectiveness of this method by designing a new innovative model, and judges the performance and results of the method by using high-performance algorithms to improve the execution efficiency of the method. Through the experiment, we can see the comparison results of the two methods at different processing times, and the experimental results are recorded in Table 2.

Table 2. Comparison of execution time of two algorithms on the same data

| | 1K | 2K | 3K | 4K |
|---------|------|------|------|-----|
| CPU | 12.0 | 97.5 | 400 | 538 |
| GPU-RPC | 1.5 | 7.7 | 16.2 | 33 |

5. Conclusions

At present, the urgent problem to be solved in the teaching organization and management mechanism of colleges and universities is to have theoretical innovation and be compatible with good systematicness and practicality. For the problems in the teaching organization and management mechanism of higher vocational colleges, this paper puts forward new solutions, contents and new structures through experimental demonstration, providing higher quality theoretical research and practical ideas for the future development of vocational colleges.

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