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Thoughts on the internal teaching quality monitoring system of secondary vocational colleges

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Abstract. The large-scale expansion of higher vocational education has brought changes to the student body structure, posing challenges to the quality of teaching in secondary and higher vocational colleges. The existing quality monitoring system for teaching is fraught with contradictions and shortcomings. Constructing a "three-all" quality assurance system can optimize the operation of such systems. For example, establishing a "dual-mentor" quality responsibility system, a student quality supervisor system, developing an evaluation module for ideological and political education in courses, and building a "three-dimensional" monitoring system for on-the-job internships. At the same time, promoting digital transformation by integrating AI classroom behavior analysis systems, establishing a quality warning indicator system, building a student learning profile system, and completing the establishment of a correlation analysis model for factors affecting teaching quality. The practical outcomes of the "three modernizations" reform at a certain higher vocational college show that student satisfaction, teacher teaching ability index, and graduate employment alignment rate have all significantly improved. Additionally, the establishment of a continuous improvement committee for teaching quality and the formation of an annual quality report system provide support for long-term quality improvement mechanisms. Digital transformation plays a significant role in enhancing monitoring effectiveness and points the way for improving internal teaching quality monitoring systems in secondary and higher vocational colleges.

Keywords: Secondary and higher vocational colleges; Teaching quality monitoring system; "All-round education"; Digital transformation.

1. Introduction

Changes in the student body structure have a direct impact on teaching quality[1]. Students with weaker foundations find it difficult to keep up with specialized courses, leading to reduced enthusiasm for learning; while those with stronger abilities may feel that the course content lacks challenge and cannot fully realize their potential. In public foundation courses, students' levels of mathematics and Chinese vary widely, making it hard for teachers to set a uniform pace and difficulty level, resulting in unsatisfactory teaching outcomes. The expansion of enrollment has put additional strain on faculty resources, causing an imbalance in the teacher-to-student ratio. As a result, teachers are unable to provide detailed attention to each student, further hindering improvements in teaching quality.

2. Existing problems in the teaching quality monitoring system

2.1 Prominent structural problems

In the monitoring of teaching quality, there is an imbalance between theoretical and practical teaching, which is quite pronounced[2]. According to survey data from a provincial vocational college in 2024, the proportion of theoretical teaching monitoring reached 68%, while that for practical teaching was only 32%. This imbalance makes it difficult to give practical teaching due attention, leading to insufficient quality assurance. In engineering programs, practical teaching is a critical component for enhancing students 'hands-on skills and their ability to solve real-world problems. However, due to inadequate monitoring, some practical teaching equipment is outdated,

project content is obsolete, and there are also insufficient instructors. These issues significantly impact the improvement of practical teaching quality and the enhancement of students' skills.

2.2 Insufficient efficiency of operation mechanism

In the process of teaching quality monitoring, there is a lag in information feedback[3].In the 2025 annual teaching report data, the average processing time for student evaluations reached 15 days. Teachers find it difficult to promptly receive students' opinions and suggestions within the teaching ecosystem, which hinders timely adjustments to teaching strategies and methods[4].It also makes it challenging to address teaching issues during the course. This significantly impacts the improvement of outcomes. During the course, if students have questions about content or methods, due to the delayed nature of data feedback, teachers may only learn about these issues after the course ends, leaving no specific feedback on the effectiveness of improvements within the teaching cycle.

3. Path of quality control system optimization

3.1 Build a quality assurance system for "all-round education"

To improve educational quality, multiple systems are established in the education - related context.A “dual - mentor” quality responsibility system with professional and corporate mentors is set up. Professional mentors need mid - level titles, solid knowledge, and research experience[5]. Corporate mentors should be industry backbones with over five - year work experience. They are jointly selected. Professional mentors handle theory teaching, while corporate mentors focus on practice. A collaborative evaluation mechanism uses students' performance as indicators, rewarding excellent mentors and rectifying or replacing underperformers.Each class has 2 student quality supervisors selected through democratic recommendation and interviews. They should have good academic performance, responsibility, and communication skills. They collect teaching feedback, assist teachers, and supervise discipline. Outstanding supervisors get priority in awards and scholarships and receive honor certificates.Clear criteria are set for “Course Ideological and Political Education” assessment. It evaluates teaching objectives, content, methods, and outcomes. A Likert 5 - scale quantifies indicators. An evaluation mechanism integrating students, peers, and supervisors is established, with student evaluations accounting for 40%, and peer and supervisor evaluations each 30%.Schools, enterprises, and students collaborate. Schools set up an internship management platform, teachers visit enterprises monthly, and hold coordination meetings. Enterprises assign mentors for on - site guidance and conduct monthly evaluations. Students write weekly journals and detailed reports, and communicate with mentors monthly. This collaborative monitoring ensures internship quality.

3.2 Promoting digital transformation

To enhance teaching quality, several systems are implemented:It uses cameras and microphones to collect real - time student data. Image and speech recognition technologies assess students' focus, engagement, etc[6].The system generates learning reports and offers teaching strategy adjustment suggestions for teachers, and also analyzes teacher behavior.This multi - dimensional system has 18 non - overlapping early - warning indicators in teaching process, effectiveness, and student development. Some indicators have clear thresholds. When data reaches the threshold, it sends warnings to teachers and managers, who must respond, analyze reasons, and take improvement measures, which are then tracked.It integrates multi - source data like academic performance, attendance, etc. Big data analysis constructs learning profiles to understand students' strengths, weaknesses, attitudes, and learning abilities. Based on profiles, personalized support is provided, and teachers can adjust teaching strategies.Data mining and machine learning algorithms explore relationships between teaching quality and faculty, resources, and management. Analysis results

offer a scientific basis for teaching decisions, guiding resource allocation, faculty strengthening, and management improvement.

4. Typical cases and empirical analysis

4.1 Practice of "three transformations" reform in a higher vocational college

The vocational college adopts several measures to improve teaching quality:The college introduces this model, dividing occupational competencies into five levels (Initial - Optimized) and covering aspects like professional ethics and skills. In the software technology program, students' skills are evaluated accordingly. Initial - level students master basic programming, while Optimized - level students handle complex projects with strong management and teamwork skills.Based on the above model, a standard is developed. Course content is divided into sections, each with specific competency requirements. For the "Electrical Control Technology" course in mechatronics, sections like electrical schematic drawing and PLC programming have detailed evaluation criteria, making course evaluations more job - relevant.There are 238 such terminals in classrooms and training venues. They can collect real - time data during teaching and practical training. For example, in CNC machining, data on tool selection and parameter settings are gathered and compared with standards to spot operation issues.The terminals enable real - time data collection and analysis. Big data technology processes the data, helping teachers understand students' interests and habits, adjust teaching strategies, and schools allocate resources more reasonably.

4.2 Data verification of reform effectiveness

Through the implementation of "three reforms", the teaching quality of this higher vocational college has been significantly improved. The following is a comparison of key indicators of teaching quality in 2023 and 2025:

Table 1. Three Scheme comparing

Metric	In 2023	In 2025	Amplification
Student satisfaction	82.5%	91.2%	10.5%
Teacher teaching ability index	78.3	89.7	14.6%
Employment matching rate of graduates	68%	82%	20.6%

The data shows that student satisfaction was 82.5% in 2023 and 91.2% in 2025, reflecting a significant increase in recognition of teaching quality. The teaching ability of instructors improved from 78.3 to 89.7, which is closely linked to notable advancements in educational philosophy, teaching methods, and professional competence. The employment alignment rate for graduates increased from 68% to 82%, indicating that the school's talent cultivation better meets market demands and enhances students' employability.

The school leadership, heads of teaching management departments, representatives of professional teachers, and industry experts form the Quality Improvement Committee for Teaching. This committee holds regular meetings to study quality issues and develop improvement measures. The full committee meets three times per semester to thoroughly analyze problems that arise in the teaching process. At one meeting, due to weak practical teaching components in certain majors, the committee formulated improvement measures such as strengthening cooperation between schools and enterprises, increasing practical class hours, and optimizing teaching projects.

The establishment of the annual quality report system ensures that schools publish their annual reports on teaching quality each year. These reports summarize the implementation of teaching quality initiatives, the operation of the teaching monitoring system, the completion of key indicators, achievements and experiences in teaching reform, as well as issues and improvement measures. By making these annual quality reports public, schools make their teaching quality status transparent to society, subjecting it to scrutiny while also providing a basis for improvement. The annual quality

reports are also distributed to various departments and teachers within the school. Through communication and learning among departments and teachers, they collectively work towards enhancing teaching quality.

5. Conclusion and outlook

Digital transformation is the inevitable path to enhancing monitoring efficiency. Building a smart teaching monitoring platform and strengthening big data analysis applications are key to achieving quality control. The intelligent platform integrates an AI classroom behavior analysis system, which can comprehensively monitor and analyze classrooms, providing specific teaching suggestions to teachers. At the same time, a teaching quality system with 18 warning indicators has been established to quickly identify quality issues. In terms of big data analysis, the student learning profile system integrates multi-source data for personalized support. The model linking teaching quality to various factors deeply analyzes the relationship between quality and these factors, supporting scientific decision-making based on relevant evidence.

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