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Practical Exploration and Optimization Path of Teaching Supervision Mechanisms in Colleges and Universities: Analysis of Teaching Quality Data in the Autumn Semester of 2024 at School A, University Z

Shantong Cai*

Tianfu College of SWUFE, Chengdu 610052, Sichuan, China

Corresponding author: Shantong Cai, caishantong@126.com

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Abstract: Teaching quality is the core guarantee for universities to achieve their talent cultivation goals, and teaching supervision, as an important means of monitoring teaching quality, runs through the entire process of teaching management. Based on the teaching quality report of School A at University Z for the autumn semester of 2024, this paper systematically analyzes the current situation, problems, and causes of the teaching supervision mechanism through multi-dimensional data analysis of expert classroom observation, peer evaluation, and classroom feedback. On this basis, combined with the application prospects of artificial intelligence technology, it proposes paths to optimize the teaching supervision mechanism, including improving the classroom observation feedback mechanism, increasing supervision coverage, and strengthening the linkage between feedback and teaching reform, providing practical experience and theoretical support for improving teaching quality in universities.

Keywords: Teaching supervision; Teaching supervision mechanism; Multi-dimensional quality evaluation; Teacher classification development

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1. Introduction

The continuous improvement of teaching quality in universities is an important guarantee for achieving talent cultivation goals. Teaching supervision is a professional work process that standardizes teaching management, maintains teaching order, inspects, monitors, evaluates, and guides teaching. It is an essential component of teaching quality management, monitoring, and assurance systems in universities [1]. As the core mechanism of quality monitoring, teaching supervision plays an irreplaceable role in providing feedback on teaching,

promoting reform, and leading innovation. Zhao and Yao pointed out through big data analysis of Z University that teaching supervision is an indispensable link in the teaching quality assurance system of universities, and proposed suggestions such as innovating supervision work models and optimizing feedback mechanisms [2]. Qiao and Shang explored the importance of improving the digitization and intelligence level of teaching supervision under the concept of digital intelligence through data analysis of Liaoning Vocational College of Light Industry. They proposed the realization of dynamic quality monitoring and precise feedback through intelligent supervision to further improve teaching quality [3]. Meng *et al.* noted that teaching supervision plays a significant role in improving the teaching ability of young teachers in universities, and resource enhancement and organizational support can effectively improve the quality of higher education teaching [4]. However, in practice, the current teaching supervision mechanism in universities still faces many challenges. Zhang believed that there are deficiencies in teaching supervision positioning, teaching supervision methods, and teaching supervision teams in higher vocational colleges [5]. Ou found that although higher vocational colleges have established a three-level dual-track teaching supervision system, there is still a significant need to improve operational mechanisms and management capabilities [6]. Xu *et al.* pointed out that university teaching supervision encounters bottlenecks in terms of system and organizational structure in high-quality development, and the unscientific evaluation system hinders the effectiveness of teaching supervision [7]. In addition, Liu's analysis showed that teaching supervision still has insufficient execution in promoting teachers' professional development and students' ability training, and these structural difficulties need to be solved by optimizing the framework and enhancing teaching data support [8].

This paper takes the teaching quality report of School A at University Z for the autumn semester of 2024 as the core data source, systematically analyzes the multi-dimensional perspectives of its teaching quality supervision, and provides a reference for universities to construct a scientific, efficient, and practical teaching supervision mechanism through problem diagnosis and path optimization.

2. Analysis of the current situation of teaching supervision in School A of Z University

2.1. Levels and coverage of classroom observation supervision

The teaching supervision system of School A at Z University is mainly divided into three levels (**Table 1**): expert supervision, peer evaluation, and internal course team evaluation, forming a multi-level quality monitoring network of "experts-peers-course team." Each level of supervision has its own focus in terms of coverage, evaluation priorities, and scoring characteristics, jointly building a comprehensive teaching quality assurance system (**Table 2**).

2.1.1. Expert classroom observation supervision

Expert supervision covers all professional courses within the school, with a coverage rate of 98% and an average score of 87.3. The focus is on the academic value of the teaching content, the achievement of course objectives, and teaching standardization. The low scores in classroom interaction and teaching innovation reflect that teaching methods and innovation abilities still need improvement.

2.1.2. Peer evaluation

Peer evaluation covers full-time teachers and most part-time teachers, with a coverage rate of 91%. Peer evaluation pays more attention to classroom teaching skills, teacher-student interaction, and teaching

organization abilities. The average score is 84.6, with a relatively balanced distribution and comprehensive evaluation dimensions, but slightly lacking in academic depth.

2.1.3. Internal course team evaluation

The coverage rate of internal course team evaluation is 85%, and the evaluation content focuses on course resource sharing and teaching progress coordination. The average score is 82.5, which is lower than expert supervision and peer evaluation, and there is less innovative evaluation.

Table 1. Coverage and scores of teaching supervision in School A of Z University

Types of supervision	Number of supervised courses/Total number of courses	Coverage rate	Scoring composition	Average score
Expert supervision	139/142	98%	Above 90 points: 15% 85–90 points: 65% Below 85 points: 20%	87.3 points
Peer evaluation	129/142	91%	Above 90 points: 25% 85–90 points: 55% Below 85 points: 20%	84.6 points
Internal course team evaluation	121/142	85%	Above 90 points: 30% 85–90 points: 50% Below 85 points: 20%	82.5 points

Table 2. Distribution of evaluation focus across supervision levels

Supervision levels	Main evaluation contents	Evaluation characteristics
Expert supervision	The academic value of teaching content; The achievement of course objectives; Teaching standardization.	Strict scoring; Low scores for classroom interaction; Low scores for teaching innovation.
Peer evaluation	Classroom teaching skills; Teacher-student interaction; Teaching organization abilities.	Balanced scoring distribution; Comprehensive evaluation dimensions; Insufficient academic depth.
Internal course team evaluation	Coordination of teaching progress; Sharing of teaching resources; Diagnosis of teaching problems.	Less innovative evaluation; Relatively low scores.

2.2. Analysis of teacher group performance

2.2.1. Statistical distribution analysis of teacher scores

Based on the teachers' situation upon entering the school, the college divides them into three groups: those who have worked for more than two years, those who have worked for less than two years, and part-time teachers. As shown in **Table 3**, there are significant differences in the score distribution among different teacher groups: (1) The score distribution of teachers who have worked for more than two years is relatively stable, with only 0.6% scoring below 85, reflecting their strong teaching standardization and stability. (2) For teachers who have worked for less than two years, the proportion scoring below 85 reaches 12%, indicating a lack of teaching experience. However, although their proportion scoring above 95 is low (4.0%), it shows considerable room for growth. (3) Part-time teachers have a high proportion of 18.4% scoring below 85, with the main issues focusing on teaching plan execution and classroom coherence.

Table 3. Statistical table of teacher classroom observation supervision score distribution for the fall semester of 2024

Types of teachers	Above 95 points	90–94 points	85—89 points	Below 85 points	Average score
Teachers with more than two years of experience	10.5%	50.0%	38.9%	0.6%	90.67 points
Teachers with less than two years of experience	4.0%	44.0%	40.0%	12.0%	89.23 points
Part-time teachers	10.5%	44.7%	26.3%	18.4%	88.73 points

2.2.2. Analysis of teaching ability supervision and evaluation for teachers

From the perspective of teaching ability scores, significant differences are observed among different teacher groups in terms of teaching design, classroom organization, and innovative teaching (**Table 4**): (1) Teachers with more than two years of experience excel in teaching design and classroom organization but show a lower willingness to innovate, particularly in adopting new teaching technologies. (2) Teachers with less than two years of experience demonstrate strong classroom interaction skills and actively try new methods, but they have room for improvement in the systematic aspect of teaching design and time management. (3) Part-time teachers possess strong practical teaching abilities, but they need to enhance their execution of teaching plans and the coherence of theoretical explanations.

Table 4. Average scores of teaching ability supervision and evaluation for teachers in the fall semester of 2024

Evaluation dimensions	Teachers with more than two years of experience	Teachers with less than two years of experience	Part-time teachers
Teaching design ability	92.5 points	88.3 points	86.7 points
Classroom organization ability	91.8 points	87.5 points	85.9 points
Innovative teaching score	85.2 points	88.1 points	83.5 points

2.2.3. Statistics of teachers' teaching effectiveness

From the perspectives of student satisfaction and achievement of teaching objectives, different teacher groups exhibit the following performances (**Table 5**): (1) Teachers with more than two years of experience have higher student satisfaction and a higher degree of achievement of teaching objectives, reflecting their strong teaching standardization and stability. (2) For teachers with less than two years of experience, students express higher satisfaction with classroom interaction, but there are slight deficiencies in knowledge imparting and the achievement of teaching objectives. (3) Part-time teachers receive high satisfaction ratings for practical guidance, but there is still considerable room for improvement in theoretical teaching and the achievement of teaching objectives.

Table 5. Student evaluation data table of teachers' teaching effectiveness for the fall semester of 2024

Evaluation indicators	Teachers with more than two years of experience	Teachers with less than two years of experience	Part-time teachers
Overall satisfaction	89.5%	87.2%	85.8%
Interaction satisfaction	86.4%	92.3%	88.1%
Knowledge imparting satisfaction	91.2%	85.7%	82.5%
Practical guidance satisfaction	88.7%	84.5%	90.2%
Achievement of teaching objectives	93.2%	87.6%	85.4%

2.3. Analysis of the current situation of feedback mechanisms

2.3.1. Timeliness of feedback

The proportion of feedback completed within two weeks after class observation is 67.8%, and some feedback is delayed for more than a month. Delayed feedback affects teachers' ability to implement suggestions, resulting in a weakened improvement effect.

2.3.2. Quality of feedback content

Feedback opinions are mostly focused on conventional issues such as the fluency of teaching language and teaching progress control, while substantive improvement suggestions targeting the achievement of teaching objectives and student engagement are insufficient, accounting for only 28% of the total feedback.

2.3.3. Connection between feedback and teaching reform

Although multiple improvement suggestions have been made in the feedback, the implementation is poor, with approximately 45% of teachers indicating that they have not received timely resource support.

3. Problems in the teaching supervision mechanism

3.1. Issues with class observation coverage and evaluation standards

3.1.1. Incomplete coverage

Despite the high coverage rate of the teaching supervision system in School A of Z University, there are still issues of inadequate coverage. Data shows that the class observation coverage rate for part-time teachers is only 74%, which is much lower than that of full-time teachers. This may result in teaching problems of part-time teachers not being identified and improved in a timely manner, affecting the overall teaching quality.

3.1.2. Single evaluation standard

The current teaching supervision evaluation standards are mainly focused on teaching standardization, such as the completeness of teaching content and the reasonableness of teaching progress. However, there are still the following deficiencies: (1) Neglect of teaching innovation: The evaluation standards pay less attention to teaching innovation, leading to insufficient innovation motivation of teachers in classroom teaching methods and technology application. (2) Lack of comprehensive evaluation of students' learning effects: The evaluation system pays less attention to students' learning effects, failing to fully reflect the achievement of teaching objectives and students' actual learning outcomes.

3.2. Insufficient effectiveness of feedback mechanisms

3.2.1. Feedback lag

The insufficient timeliness of class observation feedback is one of the main issues of the current feedback mechanism. Data shows that the proportion of feedback completed within two weeks after class observation is only 67.8%, and some feedback is even delayed for more than a month. This lag directly affects the implementation effect of improvement suggestions, resulting in teaching problems not being resolved in a timely manner. Firstly, the transmission cycle and effect of teaching supervision are not guaranteed, and improvement suggestions for teaching and teaching management cannot be timely communicated to the supervised objects. Exemplary teaching and management materials also cannot be timely distributed for learning within the school [9]. Secondly, the class observation feedback process is relatively cumbersome and lacks efficient feedback tools.

3.2.2. Lack of targeted feedback content

The current feedback content is mostly focused on superficial issues such as teaching language fluency and teaching progress control, while there is less in-depth analysis of teaching objective achievement and classroom interaction effects. Only 28% of the feedback involves substantive improvement suggestions. Such untargeted feedback is difficult to provide effective guidance for teachers. There are two reasons for this: firstly, the focus of supervision evaluation is biased towards teaching standardization, ignoring in-depth analysis of teaching effects; secondly, supervisors may lack a comprehensive understanding of teaching objectives and students' learning effects.

3.3. Inadequate support for teacher capacity development

3.3.1. Inadequate support for new teacher growth

New teachers have significant deficiencies in controlling teaching objectives and classroom management, especially in the systematicity of teaching design and time management. However, the current support provided by the school to new teachers is mainly focused on induction training, lacking targeted and continuous teaching ability improvement plans.

3.3.2. Large room for improvement in part-time teachers' teaching abilities

Part-time teachers demonstrate strong performance in practical teaching but have significant room for improvement in teaching plan execution and classroom interaction abilities. Currently, the school's support for part-time teachers is mainly focused on teaching task allocation, lacking systematic training and incentive mechanisms.

4. Paths to optimize the teaching supervision mechanism

To further enhance the teaching quality of School A at Z University and optimize the teaching supervision mechanism, it is necessary to build a systematic and scientific teaching supervision system by improving the class observation feedback mechanism, enhancing class observation coverage and evaluation effectiveness, strengthening the linkage between feedback and teaching reform, reinforcing support for teacher capacity development, and promoting the application of AI technology. The following are specific optimization paths:

4.1. Improving the class observation feedback mechanism

4.1.1. Enhancing feedback timeliness

Currently, there is a lag in class observation feedback, affecting the implementation of improvement suggestions. To address this, it is necessary to standardize the feedback process and improve feedback efficiency: (1) Standardizing feedback deadlines: Supervisors are required to complete feedback summaries and transmissions within one week after class observation to ensure timely feedback. (2) Establishing an online feedback platform: An online feedback system is developed, which records classroom performance in real time, automatically generates feedback reports, reduces manual operations, and improves feedback efficiency.

4.1.2. Optimizing feedback content

Feedback content often focuses on superficial issues and lacks specificity and operability. To address this, it is necessary to optimize the depth and breadth of feedback content: (1) Introducing AI-assisted tools: AI technology is utilized to provide specific and actionable improvement suggestions from dimensions such as

teaching objective achievement and classroom interaction effectiveness. (2) Enriching feedback dimensions: Analysis of teaching innovation and student learning effects are incorporated into feedback to help teachers more comprehensively understand teaching improvement directions.

4.2. Enhancing class observation coverage and multi-dimensional evaluation effectiveness

4.2.1. Achieving full coverage of class observation

Insufficient class observation coverage is one of the main issues in the current teaching supervision mechanism, especially for elective courses and part-time teachers. To address this: (1) Increasing the frequency of class observation: Ensuring the coverage of marginal and elective courses reaches over 90% by increasing the frequency of internal course team evaluations and peer reviews. (2) Focusing on covering part-time teachers: A special class observation plan is developed to improve the coverage of part-time teachers and ensure that teaching problems can be timely identified and improved.

4.2.2. Enriching evaluation dimensions

The current evaluation standards are biased towards teaching standardization, ignoring comprehensive evaluations of teaching innovation and student learning effects. To address this: (1) Diversifying evaluation methods: Classroom behavior observation, student focus group interviews, and other methods are combined to make evaluation results more comprehensive and objective. (2) Optimizing the evaluation index system: The system is optimized by increasing the weight of teaching innovation and student learning effects in evaluation standards, establishing differentiated evaluation index systems, and conducting personalized evaluations for different course types and teacher groups.

4.3. Strengthening the linkage between feedback and teaching reform

4.3.1. Establishing an improvement measure tracking mechanism

The inadequate linkage between feedback and teaching reform is a weak link in the current teaching supervision mechanism. It is important to designate a person responsible for tracking feedback implementation, regularly inspecting the execution of feedback suggestions, and ensuring the implementation of improvement measures. Teachers are provided with necessary resource support (such as teaching equipment, training opportunities, etc.) to help them implement improvement suggestions from feedback.

4.3.2. Building a teaching reform resource library

Teaching reform requires drawing on excellent cases and innovative solutions. It is necessary to organize and share excellent teaching cases from both inside and outside the school to provide teachers with referential teaching innovation plans. A teaching reform resource library is constructed to facilitate teachers' access to and learning from excellent teaching practices.

4.4. Reinforcing support for teacher capacity development

4.4.1. Customized teacher training

Teacher capacity development is key to enhancing teaching quality. Tiered training plans are designed based on the characteristics of different teacher groups: (1) For new teachers, we focus on basic teaching ability training, including teaching design, classroom management, and goal achievement. (2) For veteran teachers, we provide innovative teaching method training, encourage them to try new technologies and methods, and enhance their teaching innovation abilities. (3) For part-time teachers, we design special improvement plans focusing on

strengthening teaching plan execution and classroom interaction abilities.

4.4.2. Incentivizing teaching innovation

Incentive mechanisms are important tools to promote teachers' active participation in teaching reform. Teachers are incentivized to actively try innovative teaching methods through performance rewards, demonstration course competitions, etc. Teaching innovation and student learning effects are incorporated into the teacher evaluation system to promote continuous improvement in teaching quality.

4.5. Promoting the application of AI technology in teaching supervision

4.5.1. Intelligent management of class observation data

AI technology can significantly improve the efficiency and accuracy of teaching supervision. We utilize AI technology to record classroom performance in real time, automatically generate feedback reports, and reduce biases in manual evaluations. Class observation data are classified and analyzed through intelligent systems to provide scientific evidence for teaching decision-making.

4.5.2. Teaching behavior prediction

AI technology can also be used for long-term data tracking and prediction of classroom teaching behaviors. A teaching behavior database is established by analyzing teachers' teaching behavior patterns through long-term data accumulation. AI technology is used to predict the impact of teaching behaviors on student learning effects, providing data support for teaching reform.

5. Conclusion

Through a systematic analysis of teaching supervision data from School A at Z University, this study revealed the main problems in current teaching supervision work and proposed targeted optimization suggestions. These suggestions consider the characteristics of different teacher groups and focus on implementation feasibility. By systematically optimizing the supervision mechanism, it is expected to achieve an overall improvement in teaching quality, providing a referential experience for other universities.

Research shows that establishing a scientific and effective teaching supervision system is an important guarantee for enhancing teaching quality. Future teaching supervision work should focus more on systematicity, pertinence, and effectiveness, promoting the comprehensive enhancement of teaching quality in higher education through continuous improvement and innovation.

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