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Operational Mechanisms of Curriculum Quality Monitoring Systems in Higher Education Administration

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Abstract: The curriculum quality monitoring system directly affects the quality of talent cultivation in universities and is a key link in higher education administration. Curriculum quality control in contemporary universities still requires further optimization. Based on this, this paper aligns with the requirements of the Ministry of Education's "Implementation Plan for Undergraduate Teaching Audit and Evaluation in Ordinary Higher Education Institutions (2021-2025)", drawing on the teaching practices of public and application-oriented universities, and integrates relevant theories of Total Quality Management and closed-loop management to focus on analyzing the operational logic of the curriculum quality monitoring system. This paper sorts out the core components of the system, including organizational structure, indicator design, and implementation process. At the same time, this paper draws on the quality assurance practice of Lanzhou University's "One Platform, Four Systems" and summarizes an operational model featuring hierarchical management, diversified evaluation, data-driven support, and continuous improvement. Practice demonstrates that improving this monitoring system can effectively strengthen the control of the entire teaching process, improve talent cultivation quality, and offer practical references for universities to optimize higher education administration and enhance curriculum quality.

Keywords: Curriculum Quality Monitoring; Higher Education Administration; Operational Mechanisms; Closed-loop Management; Data-driven.

1. Introduction

Curriculum is the core carrier of talent cultivation. The quality of courses directly affects the actual effectiveness of teaching, and is also a core task in higher education administration. The reform of educational evaluation has been advancing, and the traditional extensive management approach can no longer meet the requirements of high-quality development of higher education in the new era. For universities, building a scientific and standardized curriculum quality monitoring system has become an important task in higher education administration.

There are still obvious problems in the quality monitoring of courses in many universities. The monitoring indicators are mostly similar and lack specificity. There is a lack of real-time monitoring during the teaching process, and many problems cannot be detected in a timely manner. After discovering the problem, feedback and rectification are sluggish, and no long-term effective improvement mechanism has been established. In this way, quality monitoring can only stay on the surface and fail to effectively boost curriculum quality.

The Ministry of Education has issued the Implementation Plan for Undergraduate Teaching Audit and Evaluation in Ordinary Higher Education Institutions (2021-2025). This document explicitly requires universities to establish the "evaluation–feedback–improvement" closed-loop mechanism for courses and teaching. The plan focuses on student development, follows an outcome-based and continuous improvement approach, and provides a clear policy basis for universities to establish a curriculum quality monitoring system [1].

This study focuses on the operational mechanism of the curriculum quality monitoring system in higher education administration. This study integrates the quality assurance practices of public and application-oriented universities in China, and clarifies the internal logic of system operation through reviewing relevant literature and conducting on-site investigations of the institutions. This paper also proposes practical improvement methods to address various problems in current course monitoring, aiming to provide feasible references for universities to optimize higher education administration and improve quality monitoring mechanisms.

2. Theoretical Basis and Organizational Structure of the Curriculum Quality Monitoring System

The stable operation of the curriculum quality monitoring system is supported by systems theory and management science, and a standardized and clear organizational structure is also the core prerequisite for its effective implementation. Total Quality Management (TQM) emphasizes the core principles of full participation, whole-process control, and continuous improvement, providing a scientific methodology for the construction of monitoring systems [2]; Closed-Loop Management Theory emphasizes the construction of a complete work chain of "Plan–Do–Check–Act (PDCA)", which can effectively prevent quality monitoring from being a mere formality and promote the continuous improvement of teaching quality.

In practice, universities in China generally adopt a three-level linkage mechanism (university-college-teaching and research section) of university, college, and teaching and research section. By clarifying responsibilities and authorities at each level, the university forms a well-defined, responsibility-based layered implementation mechanism.

Among them, the university level mainly undertakes overall planning responsibilities, responsible for formulating policies and evaluation standards related to curriculum quality monitoring, and setting the direction for the operation of the system. Taking Lanzhou University as an example, the university adopts the core framework of "One Platform, Four Systems" for undergraduate teaching, sets up a teaching quality office, establishes a two-level supervision organization between the university and the college, focuses on the entire process of curriculum construction and teaching implementation, promotes monitoring and improvement on a regular basis, and ensures the effectiveness of monitoring work.

Following the university's requirements at the university level, the college-level units are mainly responsible for the specific promotion and multi-party coordination of monitoring work, which is a key link connecting university-level planning and grassroots implementation. Jiangsu Agri-animal Husbandry Vocational College is led by its secondary colleges in monitoring course quality. By 2024, the teaching quality monitoring platform will be optimized and upgraded, and over 95% of online courses will be integrated into the platform for unified management, achieving full coverage of course monitoring. As a grassroots execution unit, the teaching and research section implements quality monitoring requirements in specific teaching stages of each course through peer review, collective lesson preparation, and teaching communication [3].

In addition, some universities combine their own educational positioning to explore distinctive organizational models and enrich the practical forms of the three-level management system. Zhongyuan Institute of Science and Technology has established the "1342" quality assurance system, while SIAS University of Zhengzhou has created the "8133 Closed-Loop" quality monitoring mechanism, both of which effectively enhance higher education administration efficiency through multi-party collaboration. Overall, the three-level management model has clear responsibilities and efficient operation, which can effectively connect various links of quality monitoring, provide strong organizational support for the efficient operation of the curriculum quality monitoring system, and help universities optimize teaching management and improve the quality of curriculum construction.

3. Construction and Implementation of Curriculum Quality Monitoring Indicator System

A scientific indicator system is the core of curriculum quality monitoring, which directly affects the objectivity and fairness of curriculum evaluation results. When building an indicator system, universities generally adhere to the principles of goal orientation, classification evaluation, highlighting key points, measurability and evaluability, taking into account curriculum objectives, teaching content, teaching process, teaching effectiveness, and teaching resources, and will not use a set of standards to evaluate all courses.

The Education Department of Zhejiang Province has implemented the "One Course, One Standard" classification evaluation method, setting corresponding evaluation indicators for different courses such as theoretical courses, practical courses, and general education courses. Evaluating theoretical courses places more emphasis on the systematic and logical explanation of knowledge, while evaluating practical courses focuses on students' practical abilities and results. This approach effectively enhances the pertinence of evaluation. Many universities will design monitoring indicators in a hierarchical manner. Zhengzhou University has established a "Five Inspections, Five Evaluations, Five Feedbacks" mechanism, which includes all aspects of teaching preparation, classroom teaching, after-school tutoring, assessment and evaluation, and effectiveness feedback in monitoring, achieving full process management of teaching quality.

When conducting evaluation work, universities will combine quantitative and qualitative methods to ensure that the results are more comprehensive and reliable. Quantitative data such as course compliance rate, student grade distribution, and teaching resource utilization rate can be directly collected and statistically analyzed through information technology platforms. Innovation in teaching methods, teacher-student interaction, classroom atmosphere, and other content need to be collected through methods such as supervision, teacher evaluation, and student evaluation [4]. Xi'an Jiaotong University has established a real-time monitoring teaching quality big data platform, which utilizes big data and artificial intelligence technology to collect classroom information and conduct multidimensional evaluations. The platform covers various courses such as theory and experiments, providing data support for course quality monitoring and teaching improvement, making teaching evaluation more consistent with real teaching scenarios.

The indicators for monitoring course quality are not fixed and unchangeable, and universities need to make adjustments based on the direction of education reform and talent cultivation needs. According to the requirements of educational evaluation reform and core literacy cultivation, timely optimizing the content and weight of indicators can better adapt evaluation work to real teaching scenarios [5].

4. Process Operation and Closed-Loop Management of Curriculum Quality Monitoring

Process supervision plays a crucial role in ensuring the quality of courses. Only by covering every aspect of teaching with monitoring can problems be identified and adjusted in a timely manner. Closed-loop control can truly implement these regulatory effects, and through a complete operational cycle, promote the continuous improvement of course quality [6]. Course quality supervision generally includes pre-class verification, in-class monitoring, post-class evaluation, feedback and rectification, and continuous optimization, which are interconnected to form a complete management system.

Pre-class verification is mainly used to standardize teaching preparation, with a focus on checking whether materials such as the syllabus and teaching plans are complete and standardized. Jiaxing Vocational and Technical College will organize experts to conduct specialized review of course materials, and ensure quality control before the start of teaching through unified management of teaching archives. During class supervision, a combination of daily inspections, specialized inspections, and random classroom observations are commonly used. Xi'an Jiaotong University utilizes a big

data platform to track classroom situations in real-time, analyze teacher teaching and student participation status through classroom replays, and help teachers improve teaching methods and enhance classroom efficiency. Post-class evaluation no longer depends on a single evaluator; Lanzhou University directly links the comprehensive evaluation results with teacher performance and professional title evaluation, strengthening the binding force of quality monitoring.

With multi-dimensional monitoring data, efficient feedback and optimization become particularly important. Yunnan Arts University has established a two-level information feedback channel that connects teachers and students, using various methods to timely convey quality issues and provide a basis for management decisions. Zhengzhou University continuously adjusts teaching schedules and lesson plans based on monitoring feedback, and improves the details of course construction. The "8133 Closed-Loop" system of SIAS University of Zhengzhou integrates goal setting, process management, and improvement optimization, enabling a comprehensive and full process management model to truly operate.

The evaluation of course quality should rely on both statistical data and subjective evaluation. Data can be automatically collected through the platform, while subjective evaluation comes from the comprehensive judgment of supervisors, colleagues, and students [7]. In actual teaching management, monitoring indicators are not fixed. Universities need to adjust them in a timely manner according to the needs of education reform and talent cultivation, so that quality monitoring can be closer to real teaching and function more steadily.

5. The Practical Path of Empowering Curriculum Quality Monitoring with Information Technology

The continuous development of information technology has enabled technologies such as big data, artificial intelligence, and blockchain to be continuously integrated into education and teaching, providing more efficient support for the upgrading of the curriculum quality monitoring system. Traditional manual quality monitoring is gradually shifting towards intelligent and precise operation, and the monitoring efficiency and actual efficacy are significantly improved.

The comprehensive evaluation platform for teaching quality has become an important support for universities to carry out course quality monitoring. The classroom teaching quality diagnosis and analysis platform built by the Education Department of Zhejiang Province forms a closed-loop management through data collection, analysis and diagnosis, feedback improvement, and review enhancement, achieving full process control of teaching quality and solving the problems of low efficiency and lagging feedback in traditional monitoring. Most of these platforms have functions such as data collection, intelligent analysis, visual presentation, and warning. The learning analysis platform of East China University of Science and Technology uses intelligent recognition of textbooks to construct a knowledge graph, which can grasp in real time the mastery of students' knowledge points, timely warn students with learning difficulties [8], and provide strong support for personalized teaching.

The use of mobile terminals has further broken the temporal and spatial limitations of course monitoring. Teachers can upload teaching data and provide feedback on related issues in real time through mobile apps, while students can evaluate and share their learning experiences online. Supervisors can also record their listening opinions at any time [9], making monitoring work more flexible. The teaching quality monitoring platform of Xi'an Jiaotong University supports real-time collection of classroom review and feedback, and teachers can adjust their teaching methods based on the data. The university's Professor Fang Aiping mentioned that the platform can help him identify shortcomings in his teaching and better meet the needs of students to optimize teaching.

Blockchain technology can ensure the authenticity and trustworthiness of evaluation data. North China University of Water Resources and Electric Power will store credit recognition data on the blockchain to prevent data tampering and enhance the credibility of monitoring results; Artificial intelligence can efficiently process massive amounts of student comments, and the digital evaluation system of South China Normal University can quickly extract common teaching problems, significantly improving feedback efficiency.

The practical effect of digitalization in education is remarkable, and since the launch of the National Smart Education Public Service Platform, the total number of transactions has exceeded 110 million. The popularization of digital monitoring and evaluation methods has made course quality monitoring more targeted and provided reliable guarantees for the continuous optimization of teaching quality.

6. Improvement Mechanism and Guarantee Measures for the Curriculum Quality Monitoring System

The long-term and stable operation of the curriculum quality monitoring system requires not only a continuous improvement mechanism that aligns with actual teaching practices, but also multi-dimensional, systematic support mechanisms such as systems, personnel, resources, and culture. From the practical implementation of universities in China, it can be seen that there are still practical shortcomings in the quality monitoring work of many universities. Some universities excessively focus on routine inspection, and insufficient attention is paid to follow-up supervision and effectiveness review of problem rectification [10]. The data and opinions obtained from monitoring have not been effectively transformed into actual driving force for teaching improvement. Some universities lack supporting institutional rules, special funding, and systematic professional training, and the business capabilities of their supervisory teams vary greatly, directly weakening the overall operational efficiency of the monitoring system.

Universities should establish a closed-loop improvement process for monitoring and collection, information feedback, rectification implementation, and review and acceptance. Key information such as classroom evaluation results, supervision and observation opinions, and student learning feedback should be promptly transmitted to instructors and teaching management departments to promote the rapid implementation and rectification of teaching problems. At the same time, the monitoring results will be directly linked to teaching performance assessment, performance evaluation,

and professional title promotion, strengthening the rigid constraints of evaluation results and inspiring teachers' intrinsic motivation to optimize teaching and improve curriculum quality [11]. The university also needs to improve the monitoring work system, formulate detailed implementation rules, clarify the responsibilities and boundaries of the three levels of the university, college, and teaching and research section, and form a clear division of labor and efficient collaborative work pattern.

The guarantee of teaching staff and resources is an important foundation for the efficient operation of the monitoring system. Universities should regularly conduct targeted thematic training to enhance the quality awareness, evaluation and problem analysis abilities of supervisors, key members of teaching and research departments, and frontline teachers. At the same time, a special working fund will be established to ensure the funding needs for the iteration and supervision of the teaching monitoring platform, as well as the promotion of teaching reform, providing stable material support for the normal operation of the system.

Universities also need to cultivate a teaching culture that values quality and involves all staff, promote the joint participation of teachers, students, and administrators in curriculum quality construction, and shift monitoring from external oversight to internal initiative. By utilizing normalized feedback, personalized assistance, and diversified incentives, we guide teachers to actively engage in teaching improvement, making the curriculum quality monitoring system truly the core support for optimizing the teaching process, consolidating the foundation of education, and continuously improving the quality of talent cultivation.

7. Conclusion

Based on practical research on curriculum quality monitoring in multiple universities, it is evident that a mature and effective curriculum quality monitoring system requires collaborative support in theoretical basis, organizational structure, indicator setting, process management, technical application, and long-term improvement. The three-level management, diversified evaluation, data-driven and closed-loop operation mode implemented by institutions such as Zhongyuan Institute of Science and Technology, SIAS University of Zhengzhou, and Wuyi University can effectively standardize the curriculum construction process, improve the operational efficiency of teaching management, and provide a practical reference path for similar institutions to carry out quality monitoring work.

In practice, there are still obvious shortcomings in the quality monitoring of courses in many universities. The monitoring indicators of some universities do not match well with their own educational positioning and professional characteristics, and the application of digital technology in the monitoring process is not deep enough. The continuous improvement mechanism after problem rectification is also not perfect, which directly affects the overall effectiveness of the monitoring system. Universities can optimize monitoring indicators based on course types and educational levels, and implement more targeted classification evaluations; Fully utilize big data and intelligent analysis methods to achieve precise quality monitoring; Combine monitoring results with teacher assessment and development evaluation to strengthen the intrinsic motivation for teachers to participate in quality improvement; Multiple stakeholders should also be engaged in quality monitoring, gradually building a teaching quality culture with full participation of all staff.

This study mainly focuses on ordinary undergraduate universities as the research object, and has relatively little involvement in monitoring the quality of courses at different stages of education such as vocational colleges and primary and secondary schools, which limits the scope of the research. In the future, the research object can be further expanded to incorporate cases from more types of institutions, integrate quality monitoring experiences from different stages, and provide more comprehensive practical support for building a more complete education quality assurance system with Chinese characteristics.

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