Research on the Digital Monitoring System of Online Course Teaching Quality Under the Background of Big Data
Taking Advertising Design Major of Anhui Finance and Trade Vocational College as an Example

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Abstract. With the rapid development of digital technology, E-teaching has become a new task of vocational college. The outbreak of COVID-19 has promoted the rapid development of online courses, and also made the quality monitoring of online teaching a new problem to be solved. Based on the analysis of the traditional classroom teaching quality monitoring system and data analysis technology based in the era of big data, this article aims at the need to improve the teaching quality of online courses, and constructs the specific content of the online courses teaching quality digital monitoring system from the perspective of the monitoring elements of curriculum teaching quality through big data analysis technology. And taking the core courses of advertising design major of Anhui Finance and Trade Vocational College as an example to verify the feasibility of the digital monitoring system. The research results could provide a technical reference for the monitoring and management of the teaching quality of university and college courses.

Keywords: Big Data · Online Course · Teaching Quality · Digital Monitoring · Monitoring System

1 Introduction

Cultivating high-quality technical and skilled personnel is the main task of vocational education, and the quality of course teaching is the key link to achieve this task. The rapid development of E-teaching, especially during the period of COVID-19, "the suspension of classes but no suspension of study" put forward by the Ministry of education has changed the form of traditional classroom teaching, and online courses become an important means to complete the teaching task in the period of home isolation. With the wide application of online courses, how to improve the teaching quality of online courses is an important issue that needs to be resolved in the process of the development of vocational education in China from quantitative change to qualitative change. In January 2019, the State Council of China issued the "National Vocational Education Reform Implementation Plan", proposing to "establish and improve the quality evaluation and

supervision and evaluation system of vocational education", and "establish the quality evaluation system of vocational education with learners' professional ethics, technical skill level and employment quality, as well as the level of industry education integration and school enterprise cooperation as the core" [4]. Therefore, based on the analysis of the factors affecting the teaching quality and the shortcomings of the current teaching quality monitoring system, this paper constructs the online course teaching quality monitoring system by building a big data analysis platform and using data analysis technology for the four elements of curriculum quality monitoring.

2 The Concept of Course Teaching Quality Monitoring System

The course teaching quality monitoring system is a systematic tool that could give teachers the continuously feedback information about course operation status, and find problems as soon as possible and adjust them timely. At the same time, the system is a process to ensure the effective implementation of the course and achieve the expected goal, as well as the consensus of all parties concerned [1]. By using scientific methods, the system can effectively monitor various factors that affect the quality of teaching and the implementation of various links in the teaching process. The teaching quality monitoring system is mainly composed of four elements, including monitoring subject, monitoring object, monitoring activities and monitoring objectives [3]. The monitoring subject is refer to the personnel related to the implementation of quality monitoring management, which is mainly composed of school-level administrators, college-level administrators, specialty department administrators and students. The monitoring object is the specific factor that affects the quality of teaching, mainly involving four factors: teachers, students, teaching conditions and teaching management. The monitoring activities refer to the specific management behaviors used to monitor the four factors of teaching quality. And the monitoring objectives refer to the teaching objectives that expected to be achieved after monitoring management ultimately.

According to the components of the monitoring system, the specific monitoring measures include five aspects, including the establishment of monitoring objectives, the determination of the personnel who carry out the monitor activities and their specific responsibilities, the monitoring of monitoring object information in the teaching process, the analysis and evaluation of the data of monitoring object, and the feedback and rectification of monitoring subject to monitoring object teaching information after teaching. The core of the teaching quality monitoring system is to diagnose the problems and reasons in the teaching process through the above aspects, and make timely improvement to ensure the accurate realization of teaching objectives.

3 The Characteristics and Main Problems of Teaching Quality Monitoring System

At present, the traditional classroom teaching quality monitoring system focuses on supervision, and adopts the three-level monitoring mode that include school-level supervision, college-level supervision and students-level evaluation. There are three mainly problems in the practice of above course teaching quality monitoring system:

3.1 Monitoring Subject Level

In the aspect of school-level supervision, most vocational colleges generally formulate teaching management documents to implement the standards of teaching supervision. Based on the content of school management documents, the secondary college constitute a teaching supervision group to carry out daily teaching monitoring and management activities according to the supervision standards from the documents. However, limited to personal experience in the monitoring process, the teaching management personnel often couldn't accurately grasp the connotation of teaching quality monitoring, which result in the limited effectiveness of monitoring system.

3.2 Monitoring Activity Level

Most vocational colleges generally use the final assessment method to evaluate the teaching quality. However, the final assessment results can not reflect the real situation of teaching quality. In addition, the monitoring process of teaching quality is not complete. In the monitoring process, administrators only pay attention to the supervision of the class-teaching process, but ignore the monitoring of the teaching process before and after class. And, the monitoring system has less monitoring of teaching evaluation results and lacks tracking links for follow-up improvement measures.

3.3 Monitoring Index Level

In the specific practice of quality monitoring, the monitoring system does not subdivide the specific indicators according to the teaching training objectives and teaching links, which makes the operability of the monitoring system weak.

4 The Construction of Digital Monitoring System for Online Course Teaching Quality

On the basis of analyzing the problems in the teaching quality monitoring system, and focusing on the construction connotation of "establishing and improving the quality evaluation and supervision and evaluation system of vocational education" in the "National Vocational Education Reform Implementation Plan", this paper constructs three levels of online course teaching quality monitoring system through the big data analysis platform, which are the digital vertical monitoring system for the monitoring subject, the digital horizontal monitoring system for the monitoring object and the digital vectorial monitoring system for the monitoring activities. The specific content is shown in Fig. 1.

4.1 Digital Vertical Monitoring System for Monitoring Subject

The digital implementation of online course teaching quality monitoring requires reasonable organization and management. First of all, the monitoring subject and the responsibilities of the monitoring subject should be clearly defined [6]. Therefore, the first dimension of online course quality monitoring system is to build a vertical monitoring system according to the framework of teaching organization and management, including school level, secondary college level, specialty department level and student level.
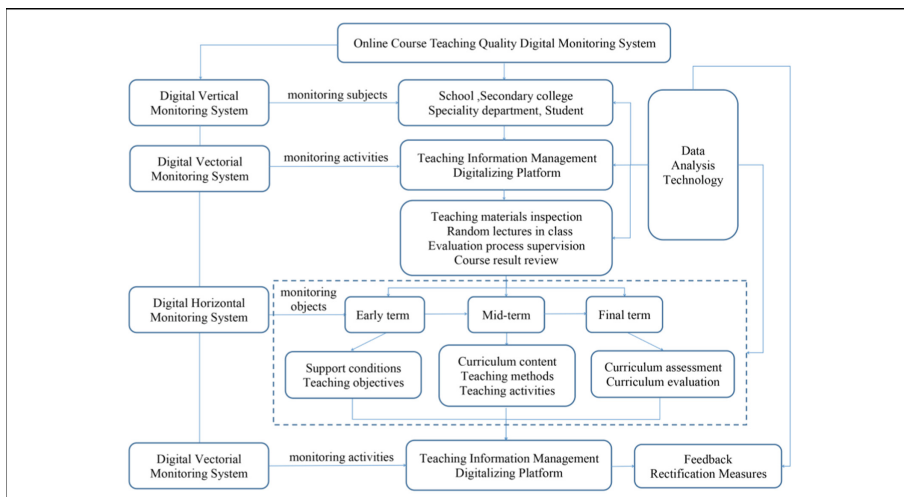
Fig. 1. Online Course Teaching Quality Digital Monitoring System

4.1.1 School Level

The main body of school-level monitoring mainly includes a management system composed of school-level administration leaders, school-level teaching supervision group and academic affairs office. The school-level monitoring department mainly organizes the monitoring of online class-teaching quality of the whole school, coordinates the working relationship between each management department and the secondary college in the monitoring system, monitors the class-teaching quality of the whole school from the overall perspective, puts forward improvement suggestions according to the problems found in the monitoring results, and supervises the implementation of the secondary college.

4.1.2 Secondary College Level

The monitoring body of the secondary college is the main body that implements the teaching quality monitoring, including the college-level administration leaders, the college-level teaching supervision group and the academic affairs office. In the process of implementation, managers should formulate specific monitoring and implementation standards at the college level firstly, and then clarify the responsibilities of teaching supervision. Afterward, they should formulate online class-teaching management methods for teachers and clarify the teaching content requirements, teacher online class-teaching standards, student online class-learning standards, and online class-teaching order management specifications, etc.

4.1.3 Specialty Department Level

The main body of specialty department monitoring is composed by dean of the department, leaders of subject areas and other teachers. In the process of monitoring, the

dean of the department organizes teachers to carry out relevant teaching activities in the teaching process, such as class-preparing, online class-listening and exchanging online teaching experience, checks the online teaching quality of teachers, feeds back the teaching problems to teachers timely, and urges teachers to rectify and improve.

4.1.4   Student Level

At the level of student monitoring subject, it mainly monitors and supervises the teaching quality from the perspective of students. In the process of implementation, the school should establish an online teaching quality information center with the participation of students from the secondary college. The secondary colleges should also have an online teaching feedback contact workstation composed of students, which should be responsible for feedback to the teaching quality information center of problems in the teaching operation. At the same time, through the formulation of the management method for teaching evaluation, monitor can standardize the monitoring behavior of students' online evaluation of courses and daily feedback of teaching opinions.

4.2   Digital Horizontal Monitoring System for Monitoring Objects

Another dimension of the online course teaching quality digital monitoring system is to construct a horizontal monitoring system based on the online teaching process, and to clarify the specific content of the monitoring object for the beginning, mid-term and final term of the course. At the beginning of the term, the specific content of quality monitoring includes the review of the hardware conditions that support teaching activities and the teaching objectives of the course. During the semester, it mainly supervises the online course content, teaching methods, and the activities of teachers and students in the course of teaching. At the final term, the content of monitoring mainly includes the examination of online course assessment and evaluation. The content of online course assessment includes class-teaching process assessment, after-class assessment and achievement assessment; the content of online course evaluation includes students' evaluation of online course quality, teachers' self-evaluation of online course and online teaching evaluation of teaching supervision group.

4.3   Digital Vectorial Monitoring System for Monitoring Activities

The third dimension of online course teaching quality digital monitoring system is the vectoral monitoring system for monitoring activities. After defining the monitoring subject and object, clarifying the way of the monitoring subject monitors the object is a key step to achieve teaching quality monitoring. It mainly includes two parts, one is the content and methods of monitoring activities implemented on the monitoring object, and the other is the content and methods of monitoring activities for the feedback formed after quality monitoring and the corrective measures taken in response to the feedback.

The content of monitoring activities implemented on monitoring objects mainly includes four methods: teaching materials inspection, random attending in class, evaluating supervision of the process and reviewing course result. The digital platform is the main implementation tool, which can quickly provide teaching management files,

teaching course materials, class attendance data, class-teaching interaction data and others useful information. Through the digital platform, the feedback and rectification measures after the course quality monitoring can be monitored in real time, and the problems found by the monitoring can be connected with the rectification measures, so as to avoid paying attention to the supervision only and ignoring the rectification problems, and fundamentally improve the quality of class-teaching [5].

5   The Practice of Digital Monitoring System for Online Course Teaching Quality

Teaching quality monitoring is an effective supervision and control of the expected educational goals and educational process from the actual situation of the school itself [2]. In order to test the usability of the online course teaching quality digital monitoring system, this paper takes the advertising design major of Anhui Finance and Trade Vocational College as an example to carry out the practice of teaching quality monitoring. The first is to build an effective vertical monitoring system, which means establishing the department teaching supervision group and the student teaching feedback group on the basis of the school and college teaching supervision group. The second is to refine the implementation path of the horizontal monitoring system according to the characteristics of course teaching to meet the needs of the course. For example, in the implementation of design courses, according to the teaching characteristics of the course "theoretical teaching before design training", the knowledge requirements of the curriculum are implemented into the design stage in a planned way. Then, the teaching process and materials in each design stage are monitored to achieve the teaching purpose. And finally, build a vector teaching monitoring information management platform to digitally manage monitoring activities.

After monitoring the online teaching quality of five core courses of advertising design major in grade 2018, the teachers rectified and improved the class-teaching content and methods according to the feedback of monitoring, and implemented the improved teaching practice in the course of advertising design major in grade 2019. By comparing the average scores of five core courses of advertising design majors of grade 2019, 2018 and 2017, it presents that the course scores of advertising design majors of grade 2019 are better than those of grade 18 and 17, as shown in Fig. 2. This reflects the usability of the
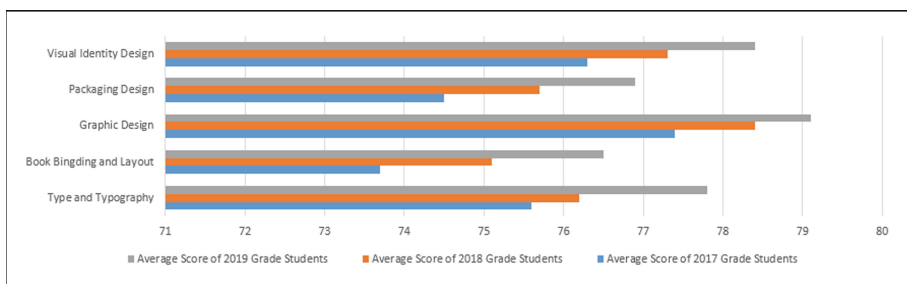

Fig. 2. Implementation path of teaching quality digital monitoring system for design courses

online course teaching quality digital monitoring system constructed by this research. The implementation of teaching quality monitoring can effectively improve the quality of online course teaching.

6 Conclusion

The education of china has entered a stage of high-quality development and the new era calls for high-quality vocational education. On this context, improving the quality of curriculum teaching is one of the important goals of the construction plan of "National Vocational Education Reform Implementation Plan". The improvement of the quality of personnel training is the most important criterion for evaluating "high-level schools" or "high-level majors". The establishment of a reasonable and scientific curriculum teaching quality monitoring system is an effective way to improve the quality of teaching practically. The construction of teaching quality monitoring system is a systematic work, which needs the active participation and support of school administrators, professional teachers and students. In the process of monitoring, the monitor implementers and teachers should fully understand the importance of the monitoring system, and use the quality monitoring system to carry out the monitoring management of the curriculum, so as to improve the teaching quality and promote the benign development of the course construction.

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