

Research on the Development of Professional Construction Quality Management Platform Based on OBE Concept

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Abstract: Professional construction work is the core of school reform and development, the foundation of school development, and is related to the survival of the school. Building a professional construction quality management platform based on the OBE concept, through regular evaluation and feedback at all levels, problems and deficiencies in professional construction can be identified in a timely manner, and effective measures can be taken for improvement. This helps to continuously improve the level of professional development and meet the demands of society and students for high-quality education.

Keywords: OBE Concept; Professional Construction; Quality Management Platform Development

The evaluation of professional construction quality is a systematic project, and the large-scale and wide-ranging data collection has obvious characteristics of long-term, periodic, and continuous support. With the help of a professional construction management platform, we provide a comprehensive solution for professional evaluation, including interpretation of evaluation standards, diagnosis of evaluation data, generation of evaluation materials, calculation of achievement degree, and analysis of comprehensive evaluation. We construct a mapping and weighting system for professional construction and evaluation standards, and use data and views to display the degree of achievement of graduation requirements and indicators for students and majors more intuitively and quickly. We can timely understand the development status of professional construction, effectively

implement continuous improvement in the process of professional construction and evaluation by discovering and improving problems, and enhance the connotation and teaching quality of the profession itself.

1. Construction of Infrastructure

1.1 Theoretical Basis

Innovating the new mode of education governance in the information age and carrying out the optimization action of education governance capability supported by big data can promote the use of Internet and other information means to serve the whole process of education and teaching. The state guides universities to transform into application-oriented institutions and comprehensively promotes the construction of quality culture through the formulation of relevant policies and guidance. For example, the Guiding Opinions of the Ministry of Education and the National Development and Reform Commission on Guiding Ordinary Undergraduate Universities to Transform into Applied Education clearly states that the OBE concept is an effective method for pursuing excellent education and integrating it into the certification of engineering education majors. A professional construction management platform developed based on the OBE concept helps to design and implement curriculum systems with clear learning outcomes, establish dynamic monitoring and continuous improvement mechanisms to ensure educational quality, have clear design goals and principles, as well as a scientific standard system and connotation, adopt a consistent training outcome model and a synchronized training plan and assessment index model, and have corresponding information system support to improve the quality and efficiency

of training plans.

1.2 Technical Basis

The professional construction management platform is based on a microservice architecture and has strong compatibility. It can adapt to the workflow of different types and organizational methods of schools, and accurately build information service links that are currently weak in schools. It can be quickly developed, applied, and iterated. Regarding the aspects related to professional construction and achievement, including internship and training, teaching evaluation, resource library construction and utilization, quality engineering, etc., they can be quickly established, utilized, and integrated. The professional construction management platform can generate various reports and analysis charts, visually displaying the degree of professional achievement and the operation of professional teaching. The data is authentic, objective, and effective. Using big data technology to collect data on online and offline teaching activities, achieve relevant data analysis, help schools standardize teaching processes, improve teaching quality, and enhance professional construction quality.

2. Construction Content

2.1 Professional Management System

Each major sets clear professional training objectives and graduation requirements, and customizes the content of the training plan, including but not limited to training objectives and graduation requirements, academic system and degree, professional characteristics and features, main disciplines and courses, main experimental and practical teaching links, basic requirements for graduation scores, teaching plans, and corresponding relationships between primary and secondary indicators of graduation requirements. The relationship data in the training plan can be connected to the professional certification platform to provide basic professional data, such as the support matrix table of the curriculum system for graduation requirements. The system supports setting different teaching outlines according to the nature of different courses, and supports online editing of course information, course objectives, the relationship between course objectives and graduation

requirements, assessment method settings, assessment and evaluation forms, performance evaluation methods and basis, outline support for graduation requirements evaluation, teaching content setting and management, teaching arrangements, basic teaching requirements, teaching methods, etc., to achieve online review and unified management of teaching outlines; Support the weighting relationship of achieving course objectives through assessment and evaluation forms.

2.2 OBE Course Teaching Management

Teachers can use course objectives in assignments, exams, and chapter tests. When creating assignments and questions, teachers can set course objectives for each question and mark the full score. After students submit, the system automatically converts the student's course objective score for that question based on their answer score, the full score score of the question, and the full score of the course objective. Teachers can edit offline exam papers online, reference course objectives to exam questions, output, print, scan, and retrieve the paper to assess students' learning progress and obtain their goal achievement. Support the construction of teacher-student schedule information, develop lesson plans based on the schedule, edit lesson plans online and support the upload of rich media files. Corresponding teaching content and activities can be carried out based on the lesson plans before, during, and after class; Support the provision of mechanisms and tools for automatically or semi automatically extracting and integrating course knowledge points from teaching resources on a course by course basis, to build a more efficient platform for teachers to organize, utilize, and continuously update and expand teaching resources; Provide students with a better platform to acquire and understand the curriculum knowledge system. Supporting both online and offline exam scenarios, the exam system combines scanning hardware devices to achieve functions such as offline answer sheet exams, online paperless exams, online invigilation, and intelligent analysis of exam data.

2.3 Teaching Quality Monitoring and Evaluation

The resources and teaching data generated by teaching will be recorded in the teaching and

teacher-student spaces, and form the school's teaching big data. In the big data analysis center, it is possible to dynamically view today's dynamics, classroom activities, check-in detection, resource construction, assessment status, etc. in real time.

Course quality analysis: Collect course data from various departments, including course resource construction, active student activities, course learning, classroom interaction, student completion rate, and course discussion; Teaching quality analysis: Record the courses taught by the teacher over the years, the teacher's activity on the platform, the use of classroom interaction, the release of tasks, resource construction, online duration, and the performance of the students taught; Analysis of learning quality: Record the number of platform activities, participation in classroom interaction types, completion of assignments, exams, etc., attendance, and academic performance of students over the years.

Overview of the completion status of professional training programs, including the number of majors in the whole school, the number of completed training programs, the number of program standards, the progress of revision in the whole school, and the ranking of completion status in the professional training programs of each college. Based on the data generated during the teaching process - online course learning data (completion status of course objectives related to assignments, exams, and tests) and offline exam data (setting question banks related to course objectives, generating answer sheets, completing paper scanning, recycling, and analysis), weight management of online and offline related objectives is carried out to complete the analysis of the achievement of the entire process objectives.

The analysis report on the achievement of course objectives includes the display of basic course information, the display of course objective information included in the course, the display of course objectives and weight items in the assessment and evaluation table, the display of course objectives and graduation requirements weight table, and the analysis report on the achievement of student course objectives. Through the summary analysis of the achievement of course objectives in the course group, the analysis of the achievement of professional objectives is completed, and

relevant analysis reports can be output.

The professional achievement analysis report can view the ability achievement goals of this grade major, the average achievement goals of students, the achievement rate, the standard deviation of ability achievement, and the statistical table of each professional ability point. The statistical table includes: radar chart of achievement distribution of each ability point, comparison bar chart of average achievement score of each ability point, and distribution of labels of each ability point; You can view the achievement level of students in each ability point under this grade major. The analysis items include: the sub ability points corresponding to the quality standards of each major, the number of students examined, the achievement goals of sub abilities, the average achievement degree of student sub ability points, the achievement rate of sub ability points, the weight ratio of sub ability points, the average achievement degree of student ability points (professional quality standards), the achievement degree of ability points (professional quality standards), and the achievement degree of student ability in the entire major; Support comparing and viewing the achievement level of each professional ability point in each course, and also support managers to view the analysis of the achievement level of specific courses; Support comparing and viewing the achievement level of students' abilities in this major. The analysis dimensions include the achievement of each student's ability goals, the achievement of professional quality standards, the achievement of sub ability points, and the overall average achievement of students.

3. Module Design

3.1 Training Program Construction and Management Module

Each major can set clear professional training objectives and graduation requirements based on its own characteristics, and customize the content of the training plan. This includes but is not limited to training objectives and graduation requirements, academic system and degree, professional characteristics and features, main disciplines and courses, main experimental and practical teaching links, basic requirements for graduation credits, teaching plans, and the correspondence

between first and second level graduation indicators. The relationship data in the training program can be connected to the professional certification platform, providing basic professional data such as the supporting matrix table of the curriculum system for graduation requirements.

3.2 Professional Objective Management Module

Develop professional graduation management requirements based on the actual talent training plan of the school, select secondary departments and professional data from the established organizational structure, fill in the corresponding grade, and after adding, enter the graduation requirements management: the graduation requirements management page displays the currently edited information. For the convenience of viewing our school's training program, a rich text editor is provided here, which can add the actual training program of the school and support uploading attachments such as graphics, videos, files, etc.

3.3 Professional Course Management Module

The professional course management module implements professional quality standards into specific courses. In this module, the relationship between majors and courses, as well as the relationship between courses and professional competency points, can be established. Assist managers in managing the courses, course objectives, and professional competency points that need to be learned for the grade major. During the teaching process, teaching activities can be linked to course objectives to obtain real-time information on the current distribution of course objective achievement, presenting statistical tables of various dimensions required for the course, which can be used to analyze the implementation of course quality. Promote the widespread development of talent cultivation based on OBE in daily teaching, improve teachers' efficiency in analyzing teaching quality, and promote the role of teaching data feedback in improving curriculum quality.

3.4 Graduation Ability Requirements Analysis Module

You can view the achievement level of students in each ability requirement point

under this grade major. The analysis items include: the sub ability points corresponding to the quality standards of each major, the number of students examined, the achievement goals, the achievement degree and achievement rate of the graduation requirements indicators for students, and the achievement degree and achievement rate of sub ability points.

3.5 Professional Assessment Management Module

Mainly achieve functions such as grading, re examination, uploading of testimony materials, internal approval, and data retention for on campus professional assessments. Professional assessment can be initiated by the head of the college, with each grading department uploading testimony materials and scoring. The secondary college uploads supplementary materials and proposes reconsideration notes. Each grading department reviews the scores, and the secondary college confirms them. The final review process is carried out by the academic affairs office. Administrators of each department can manage the content of their own college, while administrators of the academic affairs office can manage the content of the entire school. The system automatically calculates the scores for each sub item and the total score for each department and major.

4. Conclusion

The design of the professional construction management platform is closely integrated with the general standards for professional certification. Starting from the requirements of professional construction, it establishes the relationship between majors and courses, matches the correlation between professional requirements and course objectives, and decomposes them layer by layer to plan the overall achievement of the entire major. It can further provide support for professional certification and professional construction. Based on the OBE teaching philosophy, professional and course objectives are dispersed into specific teaching activities, achieving a deep integration of goal detection and daily teaching. The platform is based on a microservice architecture and has strong compatibility, which can adapt to the workflow of different types and organizational methods

of schools. It accurately constructs the weak information service links in schools, and develops, applies, and iterates quickly.

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