Research on the Construction of Teaching Quality Evaluation System

Hongcheng Liu and Yang Zhu*
National University of Defense Technology. Jiang'an District, Wuhan
*Corresponding Author Email: sun9612@sina.com.cn

Abstract. With the increasing application of information management methods to teaching management activities in Colleges and universities, it is imperative to use information system to realize the intelligent, automatic and accurate evaluation of teaching quality. This paper takes the evaluation system of teaching quality as the research object, focusing on the design and implementation of the evaluation system of teaching quality, so that we can evaluate the teaching performance of teachers fairly, reasonably and objectively from different perspectives such as students, leaders, supervision experts and colleagues, and fully mobilize the enthusiasm of teachers to complete the teaching work through the application of the system.

1. Introduction
The teaching quality evaluation system of teachers can record the evaluation opinions of students, leaders at all levels, supervision experts and colleagues with humanized interface. It can achieve the objective evaluation of teaching quality by tracking scoring, collecting opinions, comprehensive analysis, and it is easy to operate, stable, safe and objective characteristic. We mainly discuss the construction of teacher teaching quality evaluation system from six aspects: design idea, logical structure, system composition, function module, technical framework and application framework.

2. Design Idea
The software design and implementation method of "modularization first, comprehensive integration later" is adopted. According to the actual progress of the evaluation work, four sub modules are gradually realized, i.e. student evaluation, expert evaluation, leader evaluation and peer evaluation. Each module passes unit test and trial test first. After the function meets the design requirements, it is integrated. Finally, integration test is carried out to reduce the system Loopholes ensure the stability of the system.

The system strictly follows the following requirements in the design process.

2.1. Safety
The security of teacher teaching quality evaluation system is the basic attribute of the whole system. The data stored in the system involves the personal interests of teachers and is very sensitive. It is absolutely not allowed to query, steal and tamper by unauthorized users. In order to meet the security requirements, the system not only uses MD5 encryption, data logic processing, anti SQL injection attack and other technical means, but also uses original data Multi storage and other tamper proofing technique, once the original evaluation data stored by experts, student teams and leaders is inconsistent with the data provided by the educational administration department, the system can be immediately judged to be attacked, and the source of attack can be found by searching the system log, database log and network management log.
2.2. Expandability
The existence of potential change factors such as evaluation content, statistical method, result calculation rules and even unit change, teacher adjustment and so on should be fully considered in the design of the system, so that we can guarantee the convenience of system expansion through three-tier structural design of data layer, logic layer and interface layer.

2.3. Usability
The system interface should embody the humanized design, complete the evaluation activities under the condition of reducing the human operation as far as possible, and make the trainees, leaders and experts convenient and quick in the evaluation, instead of taking the use of the system as a burden.

2.4. Advanced Technology
With the rapid development of computer technology, the basic environment of computer software and hardware is constantly updated. We should ensure that the system development does not use obsolete technology, and can adapt to the latest software, hardware platform and operation mode.

3. Logical Structure
The teaching quality evaluation system of teachers completes the evaluation process in three main steps: system access, evaluation data entry and examination by the educational administration department.

Supervisors and supervision experts participating in the evaluation can quickly log in the system under the system prompt, and refuse the users who do not meet the evaluation requirements after the educational administration department completes the data preparation of student information, teacher information, class information, course information, authority setting and so on, the students.

Users can select evaluation results and input opinions and suggestions according to the list prepared by the system after logging in. In the evaluation process, student departments, team leaders and educational administration management departments can monitor and manage the evaluation process. Once violations and abnormalities are found, evaluation activities can be cancelled immediately.

After the leader of the student team finishes the evaluation, the leader and experts submit their own evaluation opinions, the Academic Affairs Committee will review them according to the system prompts. After the review is successful, the system will generate itemized statistical data based on the original data for the relevant teachers and leaders to query.

The Academic Affairs Committee shall conduct an overall audit on the semester evaluation activities according to the work plan before the end of the semester. The system generates a comprehensive evaluation conclusion for the leaders and teachers of relevant units to query after the audit is successful.

4. System Composition
The construction of the teaching quality evaluation system of teachers comprehensively adopts the joint retrieval technology, Web Service technology, rich client development technology and comprehensive encryption technology, develops and forms a unified teaching management information platform of student evaluation system, expert evaluation system, leader evaluation system, colleague evaluation system and result query system. After the completion of this system, the traditional teaching quality evaluation can be changed from manual mode to information-based mode, which can ensure the accuracy, fairness and convenience of the teaching quality evaluation activities of college teachers, so as to promote the overall teaching quality of the college through the normal evaluation of teaching quality, and increase the competitiveness and enthusiasm of teachers. The system structure is shown in Figure 1.
The student evaluation system uses the campus information platform to realize the unified identity authentication and single point login, provides the online operation environment for the student evaluation, and can generate the questionnaire survey page according to the actual needs to conduct the objective questionnaire survey to the students.

The expert evaluation system is used to provide a network platform for the supervision experts at all levels to fill in the records and comments of each class and standardize the teaching supervision activities of the supervision experts.

The leader evaluation system is used to provide online operating environment for the leaders of the Institute, Department (Department) and office (team) to evaluate the teaching quality of teachers. The superior leaders can guide and supervise the evaluation activities of the subordinate leaders.

The colleague evaluation system provides a platform for the director of the teaching and research office to evaluate the teaching quality of the teachers in the office. After each semester's teaching activities, the director of the teaching and research office will conduct comprehensive evaluation for the teachers in the office through democratic evaluation, comprehensive feedback and other activities, which will be recorded by the system. After the audit of the teaching management, the teacher will participate in the calculation of the comprehensive evaluation of the teachers as the evaluation result of the colleagues in the semester.

The system is used by all kinds of users to query the evaluation results and relevant records. At the end of each semester, after the educational administration department reviews and confirms all evaluation data, the system generates comprehensive evaluation results for each teacher, unit leader and educational administration department to query and compare, and comprehensively judge the work of teachers and teaching units loving this semester.

The evaluation management system provides a network operation platform for system administrators and educational administrators to allocate user authority, maintain basic data and audit evaluation data, which is convenient for centralized, unified and controllable management of data.

The unified login page is the user interface of the teaching quality evaluation system, which provides a general login platform for all kinds of users to enter the system.

5. Function Modules
According to the actual needs of teachers' teaching quality evaluation work, the system function of teachers' teaching quality evaluation system is mainly divided into six modules: system management, basic data maintenance, student evaluation, leader evaluation, expert evaluation, peer evaluation and result query. The system function result is shown in Figure 3.
teaching quality evaluation system

Figure 2. System function modules structure.

6. Technical Framework
Layered software architecture is conducive to the integration and development of multi task subsystem, which is suitable for the construction of teaching quality evaluation system. The system adopts three layer structure model in technical implementation, which consists of three layers: data access layer, business logic layer (or called domain layer) and presentation layer.

6.1. Data access Layer
Data access layer. Sometimes called data persistence layer, data access layer is mainly responsible for database access. In short, it is to implement the basic create, read, update and delete operations of data table, which are commonly called CRUD operations.

6.2. Business Logic Layer
The business logic layer, or domain layer, is the core of the whole system, which is related to the business (domain) logic of the system. Hierarchical architecture design usually does not allow the business logic layer to directly access the database, but must complete the access to the database through the data access layer.

6.3. Presentation Layer
The presentation layer is the UI part of the system, which is responsible for the interaction between the user and the whole system. Development tasks at this level relate only to interface elements and do not include any business logic of the system.

7. Application Architecture
The teacher teaching quality evaluation system encapsulates workflow engine, metadata support engine and other basic components. Meanwhile, it provides user authority module, data security mechanism and data exchange interface for management applications. Its application architecture can be divided into three layers: core data layer, application system layer and user layer, as shown in Figure 4.
7.1. Core Data Layer
The core of the teacher teaching quality evaluation system is the data layer. All applications are built on the data layer. Different applications provide special services for different users. The core data layer provides basic services such as data structure modeling and database related storage operations.

7.2. Application System Layer
In the application system layer, it provides users with student evaluation system, expert evaluation system, leader evaluation system, peer evaluation system, evaluation result query system and evaluation management system.

7.3. User Layer
Based on the core data layer and application data layer, the user layer can provide users with views of operation and browsing, and handle users’ business processing requests.

8. Conclusion
Teaching quality evaluation is an important method to promote the steady improvement of teaching quality in Colleges and universities. In this activity, the construction of corresponding information means is indispensable. This reality makes the construction of teaching quality evaluation system very important. Combined with the characteristics of teaching quality evaluation activities in Colleges and universities and the service-oriented software development mode, this paper makes a detailed analysis from six aspects of system design ideas, logical structure, system composition, function modules, technical framework and application framework, which lays a foundation for the construction of teaching quality evaluation system for teachers.

9. References
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