A dynamic web educational assessment system

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Abstract

Educational assessment is a mutual dynamic process for both teachers and students. Many assessments in universities usually are one-way and one-time pieces of work. At the end of the semester or teaching period, the student fills in a form, and gives his evaluation to the teacher based on some simple general choice. In such a way, the teachers lose their chances to improve their work during the teaching process. On the other hand, students also don’t have much chance to exchange their concern with teachers. This situation is getting worse in the remote teaching system.

To solve the above problems, and to enhance the mutual understanding between teachers and students, a web based evaluation system was built for mutual and dynamic assessment. This system is a Java 2 based system running in Beijing Normal University at Zhuhai Campus now. A multi-layer fuzzy evaluation model is used to handle the assessment criteria group in different layers and from different evaluation groups. The users of the system are categorized into three groups: the teachers, the students and the manager. This system is a sub-system of the management system we developed for Beijing Normal University at Zhuhai Campus. After being used for one semester, most of the users showed their satisfaction to the system.

In this paper, the structure of the assessment system is discussed. The fuzzy evaluation model is shown with an application example. The components used in the system are displayed. We hope this will give a helpful idea to change the traditional assessment process, and to contribute to the quality control of e-learning.

Keywords: DWEAS (Dynamic Web Educational Assessment System), dynamic assessment, remote education.
1 Introduction

In conventional classrooms, the communication between students and teachers usually depends on the character of the teacher. The educational managers at different levels usually only get some evaluation sheets at the end of the class. They have no idea what and how everything going on in the classroom during the teaching process. Only in very special situations will they pay attention to some specific classes. They need a stronger tool to know how the students evaluate their classes, their teachers. The evaluation should not only occur once a semester, but throughout the entire semester.

In network remote education, the evaluation becomes more important. It not only gives evaluation to the teachers, but is a communication tool among teachers and students. Teachers need know the feedback from the students in time. Students need express their concern and opinion on the classes, the lessons and the teachers. The mangers of the education also need know how everything is progressing within classes and lessons.

To meet such requirements, we designed and developed a web based dynamic education assessment system. The evaluation methods and the dynamic evaluation process have proven effective and satisfactory to teachers, students and managers in Beijing Normal University Zhuhai campus (BNUZH) of China.

Figure 1: The J2EE based information system of BNUZH.
In this paper, we will show the web based dynamic educational assessment system developed by the Software Research Institute of Beijing Normal University, Zhuhai for BNUZH. In Figure1, the left side icon at the bottom line is the Teacher Assessment Module.

As a search result, we haven’t seen much same system built yet.

Table 1: Assessment criteria to teachers.

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Portion</th>
<th>Type</th>
<th>Assessment Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Overall evaluation of the course</td>
<td>course</td>
<td>Choose</td>
<td>Like very much, like, ok, not like, hate.</td>
</tr>
<tr>
<td>2 Difficulty learning the course</td>
<td>Course</td>
<td>Choose</td>
<td>0k, some heavy, some easy, too heavy, too easy.</td>
</tr>
<tr>
<td>3 Difficulty understanding the course</td>
<td>Course</td>
<td>Choose</td>
<td>Ok, some hard, some easy, too hard, too easy</td>
</tr>
<tr>
<td>4 How are you interested in the course</td>
<td>Course</td>
<td>Choose</td>
<td>Very interested, interested, ok, not interested, boring</td>
</tr>
<tr>
<td>5 How important is the course</td>
<td>Course</td>
<td>Choose</td>
<td>Very important, important, ok, not important, forget it</td>
</tr>
<tr>
<td>6 Overall evaluation of the teacher</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>7 What is the teacher’s attitude towards the course</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>8 The clarity and exactness of the course</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>9 The mutual enhancement between the teacher and the students</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>10 The combination of theory and practice</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>11 How the teacher handles the difficult parts of the course</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>12 How worthwhile is the content of the course?</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>13 How is the cultivation of the students’ ability?</td>
<td>Course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
<tr>
<td>14 Is the course study stimulating</td>
<td>course</td>
<td>Choose</td>
<td>Good, ok, common, not good, bad</td>
</tr>
</tbody>
</table>
Figure 2: Assessment criteria to teachers.

Figure 3: A student can select one specific course to evaluate.
2 The evaluation model

We used a multilayer comprehensive fuzzy evaluation model to do the evaluation calculation [1]. The evaluation criteria are flexible to choose. The mathematic model can be configured according to the opinion of the user of the DWEAS before the system running. This makes the system easily suited for different colleges.

Also, different parts of the assessment process will set different evaluation criteria for each group. The evaluation criterion for a teacher is different from that of a student. This means a flexible frame for accepting any group of evaluation criteria and giving the correct result is important and necessary in order to set up the correct evaluation system.

3 The dynamic assessment on teachers

It is a three party communication in the educational assessment process. The major mutual assessment is among the teachers and the students. The third party is the management group, who works like a monitor of the other two parties.

As a student, he has right to issue his opinion according to the evaluation strategy defined by the management team. The evaluation strategy includes a time period the student can log in to publish his opinion to a specific course or to a specific teacher following the different assessment criteria, etc.

In BNUZH, we are using following 14 criteria to do the teaching assessment for a specific course taught by a specific teacher. These criteria are displayed in Table 1. The related web page is shown in Figure 2.

![Figure 4: Student checks his evaluation result.](image)

Figure 3 is the web page used by a student to evaluate a course teaching by a specific teacher. A student can only choose courses within his registered course list. The education manager can set up the frequency for the student to do evaluation, such as once a week, or a month, etc. Every time the student has to submit a completely filled evaluation page while he is doing his assessment. Otherwise the system will ignore the student’s evaluation.
4 The management of the evaluation result

There are lots of data related to evaluation process. In order to efficiently use this data, we designed a view for every different purpose. The student can view the results of his evaluation as shown in Figure 4.

The teacher evaluations can be viewed as the following web page:

![Figure 5: View statistics on a teacher’s evaluation results.]

We can make comparisons between teachers by viewing the distribution of the statistic percentages for all teachers as shown in Figure 6.

![Figure 6: Evaluation results in percentage to each criterion for all teachers.]

Figure 7 shows the result to each course as a bar graph and Figure 8 shows the comparison between teachers.

Figure 7: Teacher evaluations for each course with all criteria present.

Figure 8: Teacher evaluation comparisons.
Figure 9 shows the evaluation results according to department, a college or a specific course.

5 Conclusions

Dynamic assessment is important in modern education. It gives the chance for students to show their opinion to a specific course. The educational managers can use it to easily design an effective monitoring system to control the educational quality for each course or teacher. They can view the opinion of the students in time and make adjustments according to feedback and can easily compare the teaching quality among different teachers with different courses.

The dynamic assessment system also enables a flexible and convenient communication between teachers and students in network education. With the more and more remote education, the quality of the remote education is not only worried by the students or education managers, but the potential students from a large amount of people. People always want to know how one course is before he takes it. The dynamic assessment system gives them a right tool to know how the exiting course is under the teaching of the teacher. They can know the opinion from the students who already taken the course.

In all, the web based dynamic educational assessment system provides a wide application field in many educational systems, meets many different requirements, and helps the educational management tremendously in teaching quality control, which has been proven in the education practice at BNUZH.
References


