Exploration and Practice of Process Assessment of University Courses Based on Rain Classroom and Lark—Take Career Planning for College Students as an Example

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Abstract. Based on Rain Classroom and Lark, this paper applies information technology tools to the course "Career Planning for College Students" and designs and implements a new process assessment method, which enhances the plurality, transparency, objectivity and fairness of process assessment and reduces the workload of teachers.

Keywords: Rain Classroom · Lark · Process assessment

1 Introduction

In the 1980s, American educator B.S. Bloom proposed the theory of process assessment, in which teachers should design assessment forms, specify assessment indicators, strengthen process management, and evaluate students' learning process systematically [1]. The traditional process assessment index mainly consists of students' attendance and usual homework, which account for about 20%–30% of the total grade [2], making the assessment content is single, the grades account for a relatively low percentage, and the scores cannot be separated from each other. In terms of the specific operation of the assessment, course roll call will take at least 3 min of class time [3], which affects teaching efficiency. Randomly selecting students to answer questions also has chance and requires teachers to manually record statistics, which is a heavy workload and makes the assessment lack comprehensive and accurate data support. According to the "Opinions of the Ministry of Education on Accelerating the Construction of High-level Undergraduate Education to Comprehensively Improve the Cultivation of Talents" released by the Chinese Ministry of Education in October 2018, undergraduate education should increase the proportion of process assessment grades in the total course grades [3], which gives direction to the process reform of courses. This paper focuses on the introduction of Rain Classroom and Lark into the course and the design of process assessment forms to improve the diversity, transparency and fairness of process assessment.
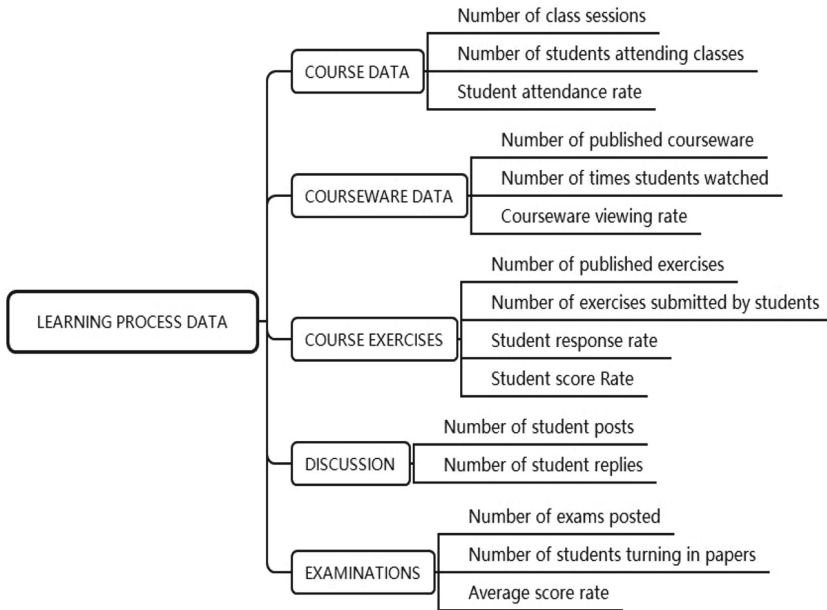
Fig. 1. Course learning data provided by Rain Classroom

2 The Application of Rain Classroom and Lark in the Process Assessment of University Courses

2.1 Rain Classroom

Rain Classroom is a new intelligent teaching solution jointly launched by Tsinghua University and Xuetang Online [4], which integrates information technology means into PowerPoint and WeChat. Teachers can push pre-study courseware to students' cell phones before class, students scan QR codes to sign in, answer questions in real time and interact with pop-ups during class, and Rain Classroom will automatically provide complete course data and personalized reports after class to provide fine and complete data support for process assessment. Figure 1 shows the course learning data that can be provided by Rain Classroom.

2.2 Lark

Lark is a new generation of one-stop collaboration platform launched by ByteDance in 2016 [5], and Multidimensional Tables is a table-based efficiency application embedded in Lark. When teachers use the multidimensional form to receive assignments, they can import the students' school numbers, and the form will automatically correspond the school numbers to the students' Lark account. Teachers set advanced permissions for the form, setting who can view, edit, and not see certain rows and columns, so they can ensure that students can submit assignments easily while the assignments are not seen by others.

The filtering and dashboard features of the multidimensional table can be operated with one click, allowing teachers to see the list of students who have not turned in their assignments on time, avoiding the traditional model where teachers need to manually correspond paper assignments or e-document assignments with the list of students one by one. The document preview feature also eliminates the need for teachers to manually download and open each assignment. This greatly improves the efficiency of receiving and reviewing assignments.

3   Design and Practice of Process Assessment of the Course "Career Planning for College Students"

The course "Career Planning for College Students" is a compulsory course for software engineering majors, and its core content is to learn the theoretical knowledge related to career planning, master the scientific career planning methods and enhance the practical ability. Because of the strong practical nature of the course, the process assessment accounts for 70% and the final examination accounts for 30%. This makes the process assessment need to cover the pre-course, in-course and post-course stages, and the assessment indicators are as diversified as possible, so that there can be comprehensive data support in the performance evaluation and ensure the performance evaluation is open and transparent. In this section, we will take "Career Course for College Students" as an example to illustrate how to use Rain Classroom and Lark to realize the process assessment of the course.

Table 1 shows the general design of the process assessment. We divided the course into three stages, each with one or more assessment indicators, each with a different percentage of the usual grade. We use information technology tools to examine students and automatically record assessment scores. Once the student learning data is aggregated at the end of the semester, the students' process assessment scores can be calculated by the formula.

3.1   Before Class

The assessment indicator at this stage is the students' pre-study. Through Rain Classroom, teachers push the courseware and related videos to their cell phones, and students

Table 1. Overall design of the process assessment

Stage	Assessment indicators	Percentage of the usual grade	Tools
Before class	Pre-learning	10%	Rain Classroom
During class	Attendance	20%	Rain Classroom
	Interaction	20%	Rain Classroom
			Rain Classroom
After Class	Usual assignments	20%	Lark
	Final Assignment	30%	Lark

can use their cell phones with WeChat to preview the course. Rain Classroom will automatically generate data on the completion rate of students' courseware and video viewing to provide data support for process assessment.

Assuming that A is the courseware completion rate which is automatically generated by Rain Classroom, then the before-class stage score UG_b is described in Eq. (1):

$$UG_b = A \times 100 \times 10\% \tag{1}$$

3.2 During Class

The assessment index of this stage is attendance and interaction, which is divided into in-course questions and pop-up interaction. When you use Rain Classroom to play the Powerpoint, it will automatically generate the sign-in QR code, and students will scan the code with their cell phones to complete the sign-in. This will take only 1 ~ 2 min to complete the roll call, saving class time, and Rain Classroom will also automatically generate the student attendance rate.

Teachers design interactive questions and add them to the Powerpoint before class, click the send questions button and set the answer time during lecture, students use cell phones to answer the questions, and Rain Classroom can automatically count the students' answers. Teachers can judge students' mastery through the correct rate and adjust the teaching pace in time, while Rain Classroom will automatically generate data on the number of answers and correct rate of students. Students can also send real-time pop-ups to the Powerpoint for interaction, which increases the fun of the class and is also one of the bases for process assessment.

In this class, course questions and pop-up interactions accounted for 40% and 60% of the classroom interaction assessment, respectively. Assuming that the student attendance rate is B, the student response rate is C, the scoring rate is D, and the data of B, C, D are automatically generated by Rain Classroom, then the mid-class stage score UG_a is described in Eq. (2):

$$UG_a = B * 100 * 20\% + (C * 40\% + D * 60\%) * 100 * 20\% \tag{2}$$

3.3 After Class

The assessment index of this stage is the usual homework and final homework. The teacher imports the student number into the multidimensional form, the multidimensional form will automatically associate it with the student's Lark account, and give the student editing rights. Then the student can upload the homework and the homework will only be seen by themselves. Teachers can use the preview function directly when reviewing assignments to save review time, not need to download additional files. Teachers can also use the filtering function of the form to know the progress of students' homework submission, so that they can make reminders and assessments.

Assuming that the teacher assigns a total of M usual assignments and one final assignment, and the score of the number m usual assignment is S_m, and the score of the

final assignment is S_f, then the student's score in the after-class period is described in Eq. (3):

$$UG_a = \frac{\sum_{m=1}^{M} S_m}{M} \times 20\% + S_f \times 30\% \qquad (3)$$

Assuming that the student's usual grade is UG, then the process assessment score is described in Eq. (4):

$$UG = UG_b + UG_d + UG_a \qquad (4)$$

4 Practice Effectiveness and Evaluation

In this study, we used a questionnaire to investigate the effectiveness of the process assessment practice of the course "Career Planning for College Students". A total of 78 questionnaires were distributed to students, and excluding the invalid questionnaires that were incomplete, 75 valid questionnaires were returned, with an effective rate of 96%. According to the results of the survey shown in Table 2, 72% of the students thought that the Rain Classroom could improve class attendance, 68% thought it could improve knowledge mastery, 66% thought it could improve the objectivity and fairness of grades, and 84% thought that Lark could improve the efficiency of the usual homework submission.

We distributed 5 questionnaires to the course group teachers, and 5 questionnaires were returned, with an efficiency rate of 100%.According to the results of the survey shown in Table 3, all 5 teachers believe that Rain Classroom is conducive to improving student attendance and interaction, classroom efficiency, and the diversity and fineness of process assessment, and 5 teachers believe that Lark can improve the efficiency of collecting and reviewing assignments and reduce teachers' workload.

Table 2. Students' evaluation of the course process assessment method (%)

Item	Very favorable	Compare favorable	General	Unfavorable	Very unfavorable
Course Attendance	44	28	24	3	1
Knowledge acquisition	25	33	36	3	3
Objectivity and fairness of results	27	39	32	3	0
Efficiency of homework submission	36	48	15	0	1

Table 3. Teachers' evaluation of the course process assessment method (%)

Item	Very favorable	Compare favorable	General	Unfavorable	Very unfavorable
Attendance and interaction rates	80	20	0	0	0
Course efficiency	100	0	0	0	0
Diversity of process assessment	80	20	0	0	0
Transparency and fairness of process assessment	80	20	0	0	0
Reduce the workload of teachers	80	20	0	0	0

5   Conclusion

In this study, we increased the proportion of process assessment grades to 70% in the course "Career Planning for College Students", applied information tools such as Rain Classroom and Lark to increase the process assessment indicators before, during and after the class. We use Rain Classroom to realize pre-course preview, course roll call, course questioning and pop-up interaction, and use Lark to collect and correct students' assignments, and then use the course statistics automatically generated by the information technology tools to accurately calculate students' process assessment scores.

Through post-class questionnaire research, this method not only makes the course assessment more diversified, improves students' attendance, participation and interaction, but also reduces teachers' workload and enhances the transparency, accuracy and objectivity of the process assessment.

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