

Research and practice of Flipped Classroom based on Rain Classroom under the background of big data

Qunxiang Ren^{1,a}, Jun Zhang^{2,b}, Lili Sui^{3,c}

(1,2,3 Department of Chemistry, Shenyang Medical College, Shenyang 110034, China)

^aEmail:renqunxiang@163.com;^bEmail:zhangjun@163.com;^cEmail:suilili@163.com

Key words: Rain Classroom; Flipped Classroom; basic chemistry; WeChat public platform

Abstract: The purpose is to construct a Flipped Classroom teaching mode based on Rain Classroom and explore the application effect of this model. Firstly, the Flipped Classroom teaching mode based on the Rain Classroom was constructed. Then, 60 undergraduate students of the medical examination technology of a medical college were selected as the observation group, and the Flipped Classroom teaching activities based on the Rain Classroom were carried out at the same time as the regular teaching. A total number of 60 students, who major in health inspection and immunology were selected as the control group for routine teaching. The average score of the final theory examination of the observation group was 86.3. The average score of the final theory test of the control group was 80.5. The satisfaction of the students in the observation group was higher than that of the control group, and the students in the observation group had a higher evaluation on the Flipped Classroom teaching activities based on Rain Classroom. The application of Flipped Classroom teaching mode based on Rain Classroom can help to realize the communication and interaction from multiple channels inside and outside the classroom, fully motivate the enthusiasm of students, improve the students' comprehensive ability.

1. Introduction

The Rain Classroom is jointly developed by the xuetangx and the Online Education Office of Tsinghua University, which aims to connect teachers and students with an intelligent terminal that can give a new experience to each link before class, in class and after class[1,2]. Rain Classroom is based on PPT and WeChat, which teachers and students are most familiar with, to realize the comprehensive interaction during the stages before class, in class and after class. Installing the plug-in of Rain Classroom, then the Rain Classroom add-in is included in PPT, so the teachers can edit and modify the teaching materials, at the same time, send the videos, audios, courseware and exercises to student's mobile phones through Rain Classroom, so students can prepare for class and review after class. During the class, teacher starts the Rain Classroom for teaching, students can interact with the teachers through the "do not understand" button and the "bullet curtain" discussion. During the whole online and offline learning process, the Rain Classroom dynamically records all the students' learning behavior and data. Through analyzing and integrating these data, teachers can analyze the teaching situation and effect quantitatively. At the same time, they can evaluate their own teaching effect, so as to make dynamic adjustment of teaching strategies[3,4].

Under the background of big data, traditional classroom teaching is faced with new challenges as well as opportunities. Using learning data analysis to improve the teaching behavior is an effective way to reform the traditional classroom. Basic Chemistry is a basic course in medical

colleges and universities. The teaching of Basic Chemistry in our college has always followed the traditional mode as teachers have been acting as givers of knowledge and students as listeners. Under this kind of teaching mode, the learning enthusiasm of students are not high, their initiatives are not strong, and the students' participation degree in the learning process is relatively low, so the effect of teacher-student interaction is not good enough. Under the above background and situation, this study introduces Rain Classroom as the online teaching platform in the course of implementing the Flipped Classroom. At the teacher's terminal of Rain Classroom, teachers can grasp the preview schedule, situation of answering questions and learning time of students, so as to get students' learning feedback in time. The research and practice of this intelligent classroom has received better teaching results.

2. Research process

2.1 The construction of teaching mode

Referring to the relevant literature at home and abroad, the basic concepts and researching status of Rain Classroom and Flipped Classroom are clearly defined. According to the basic trend of teaching reform in universities and the comparative analysis of the existing models, a Flipped Classroom teaching mode based on Rain Classroom was constructed. As shown in Figure 1.

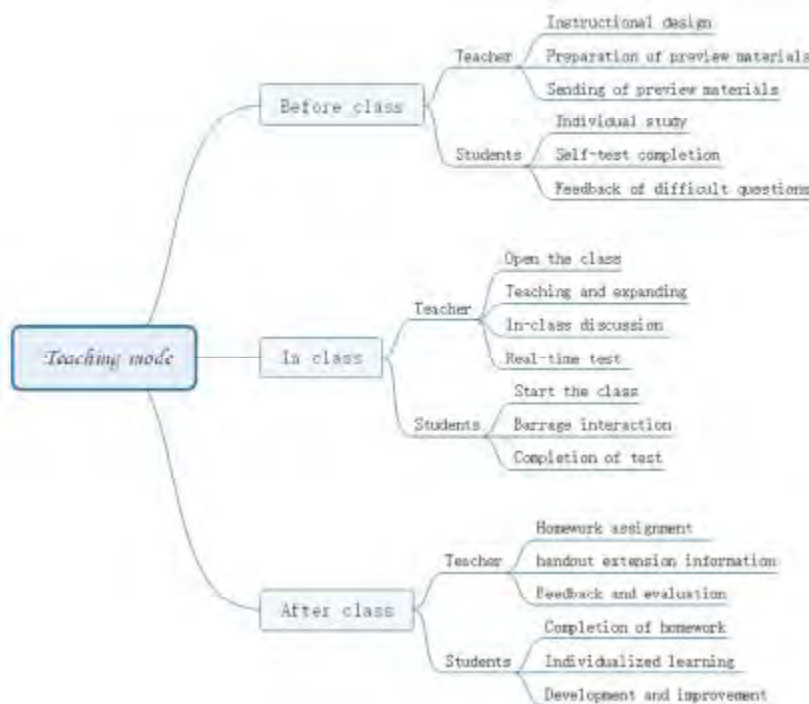


Figure 1. Schematic diagram of Flipping Classroom teaching mode based on Rain Classroom

2.2 Research objects

Using the cluster sampling method, 60 undergraduate students of grade 2017 who major in the medical examination technology of a medical college were selected as the observation group from September 2017 to January 2018, and the Flipped Classroom teaching activities based on Rain Classroom were carried out while routine teaching was conducted. A total number of 60 students, who major in health inspection and Immunology were selected as the control group. There was no difference in sex ratio, age structure, foundation level, teacher, score and other general materials between the two groups, so they are comparable.

2.3 Research methods

2.3.1 The teaching method of the control group. In the control group, the traditional teaching method of Basic Chemistry was adopted, the theory course was taught by multimedia. The teacher arranged the related preview contents before class and related review contents as well as the homework were arranged after class.

2.3.2 The teaching method of the observation group. On the basis of conventional teaching, the Flipped Classroom mode based on the Rain Classroom was used. The concrete methods are shown in Figure 1.

2.3.3 Evaluation methods. Theory examination: at the end of the semester, two groups of students were assessed by using the unified examination paper with the full score of 100 points. There is no difference between the two groups of students in teachers, examination contents, correction papers and so on, so they are comparable. Questionnaire survey: we sent the questionnaires with 10 questions to the students in the observation group. The results of the questionnaire were counted by SPSS 14.0 software and the frequency distribution is used for statistical analysis, with the results expressed by the percentage. In addition, the interview method was used to understand the two groups of students' satisfaction degree with the teaching.

3. Results

Using interview method to understand the satisfaction about teaching of the students in observation group and the control group after the end of the semester, the results showed that the satisfaction degree (91.7%) of the observation group was significantly higher than that of the control group (73.3%). The average score (86.3) of theoretical examination of students in observation group was higher than that in control group (80.5). The results of the questionnaire survey for the students of the observation group are shown in Table 1.

Tab 1. Questionnaire results for Flipping Classroom teaching based on Rain Classroom

Serial number	Questions	Number of students (n)	Percentage (Number)	
			Yes(n %)	No(n%)
1	Did you use Rain Classroom tools before learning basic chemistry?	60	0	60
2	Are you willing to use information tools and means to learn?	60	58(96.7%)	2(3.3%)
3	Do you think the Rain Classroom tool is helpful for students' learning?	60	56(93.3%)	4(6.7%)
4	Do you have a good grasp of the basic chemistry knowledge points?	60	55(91.7%)	5(8.3%)
5	Does this teaching mode enhance interaction between teachers and students?	60	55(91.7%)	5(8.3%)
6	Does this teaching model improve the enthusiasm of learning basic chemistry?	60	54(90%)	6(10%)
7	Do you think that the Rain Classroom has strengthened the	60	53(88.3%)	7(11.7%)

	fragmentation time learning?			
8	Does this teaching model enhance the ability of independent learning?	60	53(88.3%)	7(11.7%)
9	Do you like the Flipped Classroom teaching mode based on Rain Classroom?	60	56(93.3%)	4(6.7%)
10	Do you want to apply or continue to apply the Rain Classroom learning?	60	55(91.7%)	5(8.3%)

4 Discussion

4.1 Rain Classroom helps Flipped Classroom going well.

Including better interactivity and instant feedback, Rain Classroom has outstanding convenient data collection function. According to the backstage data analysis, the preview situation, exercises correctness and questions from students can be shown clearly. Those above will change the passive role that teachers play in traditional Flipped Classroom. Besides, teachers can adjust their emphasis on teaching in time based on the data result and the bullet screen of Rain Classroom so that students' learning experience and effect of Flipped Classroom can be improved. Therefore, Rain Classroom helps Flipped Classroom going well and improves students' learning initiative.

4.2 The Flipped Classroom teaching mode based on Rain Classroom aroused students' initiative of learning basic chemistry.

The result of survey shows that people who think the Flipped Classroom teaching mode based on Rain Classroom can improve the initiative of learning basic chemistry occupies 90%. Even though there are a lot of advantages in traditional classroom, novel technology and method are more attractive for college students at present. That's why they have interest and initiative on learning. At the meanwhile, this teaching mode provides larger learning space for students. Students learn from teaching material by themselves, watch videos, refer to reference books and communicate with classmates. In this process, students learnt to think actively, seek key point and difficult point, experienced the formation of knowledge, had fun with learning and enjoyed the happiness of success. Their potential was fully realized and their learning initiative turned to interest on learning basic chemistry. In the classroom, teachers and students worked together to explore and solve problems, finish learning tasks and make full use of class period. Such teaching and learning in and out of class can improve students' initiative and autonomy on learning.

4.3 The Flipped Classroom teaching mode based on Rain Classroom helps communication and interaction between teachers and students.

The research shows that there are 91.7% of students think it can enhance communication between teachers and students. Rain Classroom adopts modern means of communication that make the communication between teachers and students more convenient and efficient. Pre-class and after class period, students can leave their comments on the communication platform of Rain Classroom when they have questions during preview and review so that teachers can answer some of the questions. If a lot of students don't understand the questions, teachers can adjust class appropriately and emphasize the questions to ensure that students understand the knowledge during the communication and interaction. During the class, students can press "Question" on app with cell phone when they have questions of knowledge and teachers can know that and explain in time. Also,

the “bullet screen” function can be turned on in class. Students live comment from cell phone can be shown on screen and the instant communication and interaction between teachers and students can be realized. Fulfilling more interaction between teachers and students, to some extent, can activate the atmosphere in the classroom and make the classroom teaching efficient.

4.4 The Flipped Classroom teaching mode based on Rain Classroom cultivated students' self-learning ability.

The result of survey shows that people who think the Flipped Classroom teaching mode based on Rain Classroom can cultivate students' self-learning ability occupies 88.3%. In traditional teaching mode, students study in the classroom and solidify knowledge after class, while in this mode, students learn knowledge before class and solidify knowledge during the class. There is no more teacher-centered knowledge-feeding pattern. Instead, students are guided to learn initiatively. The center in a class changed from teacher to student. Therefore, students became the main part of learning. All of the knowledge need to be learnt consciously, initiatively and independently. Students need to read and think, discover and solve problems and then summarize on their own. Students' self-learning ability and the ability of discovering and solving problems are trained virtually.

5. Conclusion

The Flipped Classroom teaching mode based on Rain Classroom broke the limitation of traditional teaching. There is no more teacher-centered knowledge-feeding pattern. Instead, students are guiding to learn initiatively. Students like having class and become more initiative. Their learning motivation is stronger and the learning attitude is better. The data of teaching experiment shows that in observation group, students' learning experience is more positive and the methods of study is deeper. They spent more on study so they got stronger confidence and effect. The online and offline teaching mode based on Rain Classroom advantages teachers forming open, shared, interactive, rich and flipped teaching concept.

6. References

- [1] Y. Feng, Application of Rain Classroom in Organic Chemistry Experiment Teaching, Guangdong Chemical Industry, 2018, 45 (7) :266-267.
- [2] Y. Zhang, J. Liu, Study on the Analytical Chemistry based on Microlecture and Rain Classroom, Guangdong Chemical Industry, 2018, 45 (3) :207-208.
- [3] S.G. Wang, Rain Classroom: The Wisdom Teaching Tool in the Context of Mobile Internet and Big Data, modern educational technology, 2017, 27 (5) :26-32.
- [4] A.B. Xiao, J. Xie, F.Q. Gong, The Application of Rain Classroom on the Flipped Teaching of Ideological and Political Theory Course in Universities, 2017, 27 (5) :46-52.