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Research on the Design and Application of Intelligence Classroom Teaching Model with Rain Classroom Digital Support

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ABSTRACT Under the background of current deep integration of web and education, Rain Classroom is an intelligent class teaching tool. This paper analyzes the construction model of intelligent class supported by Rain Classroom, taking the course of Corporation Finance taught by the author as an example. The questionnaire filled out by lots of students shows that Rain Classroom is very popular with students. They think it is a good helper for their study. It has aroused students' learning enthusiasm and initiative. Based on learning data offered by Rain Classroom, teachers can provide individualized and student-centered teaching services.

1. INTRODUCTION

With the rapid development of information technology, educational informatization has played a certain role in cultivating innovative talents. However, the interaction between information teaching application and media information technology is still not abundant. Classroom teaching in colleges and universities still remains in the application of multimedia demonstration such as PPT, flash animation and video and audio files and mainly on the display and transmission of collective information. Classroom teaching simply evolved from "human irrigation" to "machine irrigation". The teachers become the microphone for transmitting fragmented static knowledge, and the students become the container for carrying the knowledge taught by the teachers. In the traditional online teaching classroom, there is the lack of effective interaction between teachers and students. Students' learning enthusiasm is not high. Students cann't get teachers' evaluation very quickly in class.Teachers cannot receive effective teaching data. Teachers learn about students' mastery of knowledge only by observing students' eyes or expressions in class, or through frequent quizzes.

At the same time, according to the 43rd Statistical Report on the Development of China's Internet[1], by December 2018, the number of mobile Internet users in China has reached 817 million, and the proportion of netizens accessing the Internet through mobile phones is as high as 98.6%. Among the netizens in China, students become the largest group, accounting for 25.4%. With the wide use of mobile phones, the phenomenon of students' playing with mobile phones in class is prevalent in the university classroom, and very few students listen to teachers attentively. It is not uncommon for students to never look up to listen to teachers in a whole class. According to a survey of mobile phone use among Chinese college students released by the Max Research Institute in 2018[2], more than 80% of college students are addicted to the use of mobile phone. More than 70% of college students use their mobile phones to chat and update social media in class, and nearly 60% use it for entertainment, such as playing games, watching videos, watching live, watching e-books or listening to music. Students' attention is focused on playing with mobile phones in the classroom. How to make college students use their smart phones for learning is an urgent problem for educators to think about.

In order to make information technology and education more deeply integrated, realize the intelligence, informatization and digitization of the whole teaching process, and make full use of students' smart phones for classroom teaching, and give full play to the functions and applications of mobile phones in improving learning efficiency, Tsinghua University and the organization of Schools Online release the intelligence teaching solution tool- Rain Class in April 2016.



2. The Construction of Intelligence Classroom Based on Rain Classroom

Rain Classroom is a new intelligence teaching solution jointly launched by Tsinghua University and the organization of Schools Online. It is committed to providing data and intelligent information support for all teaching processes of "pre-class, in-class and after-class" quickly and free. Through Rain Classroom teaching, teachers' teaching is transformed from "experience-driven" to "data-driven" teaching. Class teaching changes from traditional teacher-centered passive teaching to students' ability training. The use interface of Rain Classroom is based on WeChat and PPT, which is the most familiar software on the mobile phone and computer termination. It is very easy to use[3][4]. Tsinghua University has conducted a questionnaire survey on university teachers who use Rain Classroom in 2017. The statistical results show that 85.1% of teachers think Rain Classroom is convenient to use[5]. Its ease of use has been unanimously recognized by teachers and students. The use of Rain Classroom does not increase the workload of teachers. Teachers do not need to do PPT again. The teacher only needs to open the old PPT and login to the Rain Classroom. If necessary, teachers can add some new contents to the courseware, such as in-class exercises.

Rain Classroom, as an intelligent teaching tool under the background of educational informatization and big data, provides effective data analysis support for teaching, and its birth provides technical support for the construction of intelligence class. The construction of intelligence class supported by Rain Classroom is divided into "pre-class, in-class, after-class" steps.

(1) Before class: learning before teaching, learning decides teaching. Before class, teachers release courseware, MOOC video, audio and other materials to students' mobile phone WeChat, students carry out independent preview, click on the "not understand" button to give feedback to teachers for the content they do not understand, teachers deepen learning situation analysis, optimize teaching design, and focus on explaining the key and difficult knowledge in accordance with the results of students' preview data analysis. The teacher can also carry on the individualized instruction in accordance with each student's preview situation, different knowledge structure and understanding ability.

(2) In class: efficient interaction, full data support. Firstly, the teacher opens the Rain Classroom teaching model, the students login WeChat and scan two-dimension code to enter the class. The courseware is simultaneously released to the student mobile phone termination, the student may click the "not understand" button to send their problems to the teacher, and the teacher can adjust the teaching process in time. Secondly, Rain Classroom provides the function of bullet screen comment, which is deeply loved by college students. Students can make their comments on screens simultaniously when teachers raise question. And thus, interaction between teachers and students is very active. Students can participate with class activities very actively. In bullet screen comment, students' names can be anonymous on screens when they send comments on screens, while teachers can see their real names clearly on teachers' background interface. When we use the bullet screen comment to make classroom discussion, students can express their views more enthusiastically, and at the same time, the bullet screen comment can promote timely and convenient communication between teachers and students, which is helpful for teachers to understand students' ideas in a comprehensive and real-time way. Thirdly, Rain Classroom can provide lots of classroom quiz, whick can make the interaction between teachers and students more frequent. Teachers can set the time limit for questions answering when they carry out real-time classroom tests. In this way, teachers can quickly and dynamically understand whether students have mastered knowledge points teachers teach, and can also send some prizes such as classroom red envelopes to excellent students. Teachers can also display the rate of answer correctness and the distribution of answers in real time, so that students can know how accurate their answers are. With the support of the Rain Classroom, the classroom teaching atmosphere becomes active, the students' attention becomes more concentrated than ever before, and the teaching effect is remarkably improved.

(3) After class: in the platform of Rain Classroom, teachers can release homework and related learning materials, collect student answer data and send expansive data and reading materials for students to learn. The real-time dynamic tracking of the whole process of the students' learning is

carried out in the Rain Classroom, and the teachers can evaluate the students' learning situation objectively and comprehensively. In this way, the objective and fair evaluation system improves the students' learning initiative, meets the individual learning needs, and improves the effective teaching of teachers' knowledge[8].

3.University Intelligence Teaching Practice Based on Rain Classroom

The key to carry out intelligence education with the support of Rain Classroom is the organization of teaching resources and teaching activities. Taking the chapter of Time Value of Monetary Funds in the basic course named Corporate Finance as an example, this paper expounds the implementation process of carrying out intelligence classroom teaching activities. The designing of teaching activities are shown in the following Figure 1[9][10][11].



Figure 1 Designed teaching activities

3.1. Pre-class preparation

(1)The first step for teachers to do is to create a virtual class in Rain Classroom. If you use Rain Classroom for the first time, you need to create a virtual class. Please ask students to scan WeChat two-dimension code or input invitation code to join the virtual class and update their personal data. After that, students can enter the class without joining the virtual class again.

(2) The second step for teachers to do is to send preview materials. Teachers release to students their preview materials, such as pre-class thinking, learning goals, learning guidelines, learning difficulties and learning content. Teachers can use the Rain Classroom plug-in to insert test questions and all kinds of MOOC videos and web videos into the PPT of the course. For example, during the course of Corporate Finance, teachers can insert Corporate Finance MOOC videos offered by Southwest University of Finance and Economics and Investment Science MOOC videos offered by the Central University of Finance and Economics. In teaching non-systemic risk classification, the author has inserted a video clip of share price falling due to the mistakes of company management from the hot TV series named My First Half of My Life to make teaching lively and interesting. You can also add audio voice explanations for each page of PPT, and finally send pre-class preview materials to students' mobile phones.

(3) Teachers can receive feedback of students' preview and optimize teaching design made by teachers. In the process of previewing lessons, students can produce data by clicking "collection" and "not understand" buttons and answering test questions to help teachers optimize teaching design, explain the difficulty knowledge, and provide individualized and targeted teaching services. On this



platform, teachers can also knowe students' preview time and pages they have read. For example, if the students find it difficult to understand the present value and final value of the beginning annuity by doing the test questions, it is necessary to focus on explanation of related knowledge in class and provide abundant knowledge points of the relevant cases. For example, some students are not good at mathematics, and they can not understand the formula of the end-of-year present value and the final value. The teachers need to provide individualized guidance to them.

3.2. Classroom teaching

When teachers use Rain Classroom in teaching, the whole class teaching process is supported by data and there is high efficiency interaction in classroom teaching. The transformation from teacher cramming knowledge to student-centered efficient class teaching has been achieved.

(1) Real-time classroom interaction. When face-to-face teaching in the Rain Classroom is opened, the students can press the "not understand" button at any time when they do not understand the difficult content in each page of PPT and give feedback to the teacher in real time. And in this way, teachers can know the students' learning difficulties and adjust the teaching process. After teachers finish teaching each knowledge point, the time limited test is given. The overall students' answers are immediately collected through the test, and teachers can adjust their teaching strategy.

(2) The problem of playing with your mobile phone has been effectively solved, with students actively participating with class activities. The function of the bullet screen comment in Rain Classroom greatly increases students' enthusiasm of expressing their ideas, whick makes the communication between the teachers and the students convenient. Meanwhile, students make active participation with class activities. In addition, during the teaching process, the test questions and random name call function often pop up, to help students pay full attention to learning. The teacher can also send some prizes such as red envelopes to students who answer questions well, which can enliven the classroom atmosphere and stimulate students'interest in learning. Through the Rain Classroom teaching, the problem of playing mobile phones in class has been effectively solved. Smart phones no longer distract students' attention. Instead, they become a good helper to students' learning.

3.3. Review and consolidation after class

In order to review and consolidate knowledge learning, the teacher can use the Rain Classroom to release and send related exercises and review materials. When students do exercises and review materials by self-learning after class, teachers can grasp students' after-class learning behavior data and know students' time spent on browsing review materials on Rain Classroom platform so as to adjust and optimize the teaching design and teaching strategy of the next course. For example, after the class teaching of the chapter named Time Value of Monetary Funds, the teacher sends the calculation questions such as single interest, compound interest, present value and final value of annuity. Through the students' learning behavior data, it can be found that the students do not have a good grasp of the present and final values of complex annuities. In the course of Corporate Finance, the author tries to give intelligence teaching to students' learning initiative have been greatly improved compared with the previous semesters. After the intelligence classroom teaching in this semester, students' passing rate of vocational qualification examination is also higher than that of students who are not given intelligence teaching.

3.4. Investigation and analysis of implementation effect

After a semester of classroom teaching reform, the author aims at getting to know the students' satisfaction with the intelligence classroom teaching model supported by the Rain Classroom by aking 100 students in the class taught by the author to do survey in the course of Corporate Finance. 92 valid questionnaires are recovered. The results of the survey are shown in the following Table 1.



1. Do you think there is a need for a preview of Corporate	A. Yes 63.04%
Finance?	B. No 36.96%
	A. Basically yes 35.87%
2. Do you read contents released in Rain classroom before class and after class?	B. Usually yes 18.48%
	C. Sometimes yes 25%
	D. Usually no 13.04%
	E. Basically no 7.61%
3. Rain Classroom makes my study more interesting and	A. Yes 64.13%
effective. Do you agree with this?	B. No 35.87%
4. Does bullet screen comment function of Rain Classroom	A. Yes 72.83%
improve the communication between you and your teacher?	B. No 27.17%
5. Does time-limited exercise in class make you concentrate	A. Yes 69.57%
your attention on class learning?	B. No 30.43%
6. Teachers use Rain Classroom to assign in-class time limited	
exercises, and students' answering results are automatically	A. Yes 68.48%
calculated and included in the usual performance results. Can	B. No 31.52%
this make you have higher enthusiasm to answer questions?	
7. Does the function of random name call provided by Rain	A. Yes 76.09%
Classroom make you focus your attention on learning?	B. No 23.91%
8. Do you think the integrated teaching model based on Rain	A. Yes 69.57%
Classroom is helpful to cultivate your ability to learn	B. No 30.43%
	A X (4.120)
9. Do you like to continue the current integrated teaching model	A. Yes 64.13%
based on Rain Classroom?	B. No 35.87%
	A. Slide synchronization and "not
	understand" feedback 52.17%
	B. In-class time limited exercise
10.What functions do you like in the Rain Classroom?	assignment system 35.87%

Table 1 Evaluation Statistics of Intelligence Classroom Teaching Model Based on Rain Classroom

It can be seen from the results of the questionnaire that most of the students are satisfied with the use of the Rain Classroom. It can be seen that using the Rain Classroom to carry out the intelligence teaching can arouse the interest of the students' study, and the students' learning initiative and enthusiasm. Which functions do you like in Rain Classroom? Students' most choice is the function of bullet screen comment. Rain Classroom builds a bridge for communication between teachers and students.

C. Courseware release 45.65%D. Bullet screen comment

classroom discussion

E. Others

57.61%

19.57%

4. Conclusion

(multiple)

Through the intelligence classroom teaching practice supported by the "rain class" for a semester, the author finds the classroom teaching atmosphere becomes more active, the interaction between teachers and students becomes more frequent and the students' learning initiative is also greatly improved. The problem of playing mobile phones has been effectively solved. Through the feedback of the learning behavior data provided by the Rain Classroom, the teacher can conduct the individualized teaching in time. Through the personalized teaching service, teachers focus on the difficult learning points accurately and adjust the teaching process. The learning track recorded in Rain Classroom helps teachers evaluate students objectively and impartially. Intelligence class teaching plays an important role in promoting teaching. However, the key to the successful development of intelligence teaching is to organize teaching resources and teaching activities, so teachers need to make systematic preparations, collect relevant teaching resources, be familiar with the use of teaching software, optimize teaching design in time and accumulate teaching experience.



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