Research on Blended Learning Mode Based on Rain Class*

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Abstract—Online education platform such as MOOC (massive open online course), with its rich learning resources, free learning time has been welcomed by a large number of students, but due to its untimely feedback and poor interactivity, it has led to a high dropout rate. Blended learning combines traditional education (face-to-face) with m-learning to provide learning interaction and feedback while providing a large amount of learning resources. The Rain Classroom is a WeChat-based smart teaching tool designed by Tsinghua University. It allows students to prepare before class on the mobile phone and interact with classmates and teachers during the class. This paper aims to study whether the Rain Classroom can achieve learning interaction and learning feedback, and whether learning interaction and learning feedback have a positive impact on learning satisfaction.

Keywords—online education; blended learning; Rain Classroom; interaction; feedback; learning satisfaction

I. INTRODUCTION

Online education is widely welcomed by students and teachers, among which MOOCs (massive open online course) occupy a dominant position due to their free learning time, abundant resources and ease of use. However, due to the untimely online feedback and poor learning interactivity (student-student-interaction, student-teacher-interaction, student-content-interaction), a large number of students in MOOCs have low learning satisfaction, and many students drop out of their studies. In 2013, Devlin, a professor at Stanford University, boldly pointed out that "MOOCs will eventually disappear, leaving only online learning resources [1]. Admittedly, if learning lacks interaction, it is a failure. Picciano pointed out that learning success requires students to have the opportunity to ask questions, give feedback and share personal views [2]. Moore et al. believed that interaction and feedback are essential factors to predict the success of learning [3]. Alonso and Hardless also support this view, believing that interaction and feedback are important influencing factors for students' long-term satisfaction [4]. Blended learning increases learning interactivity and feedback by introducing traditional teaching methods into online education. Bitzer et al. believe that IT technology can improve classroom quality [5]. Dyson et al.

found that information technology and mobile terminals can improve the quality of class teaching and realize real-time transmission of interactive data between teachers and students [6]. According to Moore, learning interaction consists of three levels: student-student-interaction, student-lecturer-interaction and student-content-interaction [7].

Rain Classroom is an intelligent teaching tool developed by Tsinghua University and Xuetang online according to the teaching environment in China. It is mainly aimed at the field of higher education. It consists of three parts: mobile terminal, computer terminal and remote server. Mobile terminal and computer terminal are directly used for teaching, and remote server is used to support system operation [8]. It is a wisdom teaching tool based on WeChat public platform and PowerPoint. Teachers can issue tasks, test questions, PPT and so on in Rain Classroom. Students can sign in, vote, accept tasks and give questions and feedback to unintelligible PPT. Rain Classroom can track students' learning situation, collect procedural data and generate classroom reports in real time. In this way, students can know their learning situation in time, and teachers can adjust their learning progress appropriately. At the same time, the rain classroom can also realize the discussion between students and students, and the interaction between students and teachers. We aim to explore whether blended learning based on Rain Classroom can achieve three interactive modes (student-student-interaction, student-lecturer-interaction, student- content-interaction)[9], whether it can enable students to provide timely learning feedback, and whether it can improve students' learning satisfaction.

II. LITERATURE REVIEW

A. MOOC

MOOC is the abbreviation for massive open online course, which was launched in 2008, when 2,300 students participated in the registration. MOOC has aroused widespread concern in the education community and brought profound changes to traditional education and learning methods. Mc Auley et al. believe that MOOC has the following characteristics: 1. massive: There are no restrictions on the number of MOOC students, and there is no national border. 2. Open: For students, the cost of

registering a MOOC is almost zero. MOOC is global, and anyone can visit MOOC anytime, anywhere to learn. 3. Online: All courses at MOOC are based on the Internet. All learning materials are digital, so students can access them whenever they have a network. 4. Course: The MOOC course is designed according to the basic principles of education and teaching. The entire teaching process also has corresponding teaching arrangements and learning objectives [10]. Siemens found that MOOCs can be divided into two categories, cMOOC and xMOOC. cMOOC is a MOOC form based on the theory of relevance learning. In 2008, Siemens and Downes created a MOOC form that focuses on creation, construction, and social network interaction. xMOOC, such as Coursera, Udacity, and edX, focus on the dissemination and diversity of knowledge and traditional forms of communication. As a new form of MOOC, xMOOC places traditional college learning models in an online learning environment, emphasizing software testing, self-assessment, and learner peer evaluation [11]. However, there are many problems with MOOC. First, the completion rate of the course is not high. In September 2012, EDX published relevant data on the course of Circuits and Electronics, showing that at the beginning of the course, 150,000 students registered to study, while less than 10,000 people insisted on finishing the course, with the withdrawal rate as high as 94.7%[12]. At the same time, MOOC learners lack learning experience. Chen Guoming thinks that MOOC cannot make students communicate face-to-face and lack of learning interaction, thus failing to achieve the effect of traditional teaching [13].

B. M-learning

Allexzander Dye believes that m-learning refers to the use of mobile technology to acquire knowledge anytime and anywhere, and its mobile terminal must be able to effectively present learning content and provide teacher-student interaction[14]. Duncan-Howell and Lee argue that m-learning involves the use of blended learning with devices outside educational institutions [15]. According to Weessner and Dawabi, m-learning is flexible and convenient, and can be used in the classroom without any special equipment [16]. Cavus N and Ibrahim D developed an M-learning tool (MOLT) to help students learn new English vocabulary by applying SMS services in English teaching. The study found that students are very interested in this m-learning tool [17]. Omega LD and Plata RB improve students' learning satisfaction by introducing mobile technology into medical nursing teaching, allowing students to apply their knowledge at any time in the real environment and evaluate their learning outcomes[18]. The results of this study show that m-learning tools can improve students' learning satisfaction and improve teaching quality.

C. Blended Learning

Professor Margaret Driscoll defines blended learning as a combination of multiple teaching methods and teaching techniques based on Web technology, a combination of traditional teaching methods and mobile learning to improve learning satisfaction [19]. According to Michael B. Horn and Heather Staker, blended learning is an online learning approach that combines formal classroom learning with student free choice [20]. He Kekang believes that "blended Learning is a combination of traditional teaching methods and e-learning teaching methods. While giving play to the main role of students' initiative and creation, it should also give play to the role of teachers' guidance, inspiration and supervision [21]. In short, blended learning is a combination of traditional face-to-face teaching and mobile information technology.

III. MODEL AND HYPOTHESIS

A. Interaction

Bryant and Heath think that interaction means solving the relationship between people [22]. We define interaction itself as learning activities, including communication between students, lecturers and content [7] [23]. In this paper, we draw on Moore's interactive model in 1989, which includes three levels of interaction types: student-student-interaction, student-lecturer-interaction and student- content-interaction. Student-student-interaction refers to the opportunity for students to collaborate and discuss with other students in the learning process. Student-lecturer-interaction means that students can ask questions and discuss with teachers in class. Student-content-interaction refers to assignments in which students can obtain specific content and discuss specific assignments.

B. Feedback

Feedback refers to the process of returning the output of the system to the input and changing the input in some way, thereby affecting the function of the system [24]. In this paper, feedback refers to the fact that students can question teachers about what they don't understand in the learning process. At the same time, teachers can get to know the students' mastery of learning content in the first time, and answer questions pertinently, and arrange teaching progress reasonably. Feedback is divided into two dimensions: feedback convenience and feedback timeliness. Feedback convenience means that students can easily give feedback in Rain Classroom when they encounter learning content they do not understand. Feedback timeliness refers to the degree to which students can promptly ask questions to their teachers in Rain Classroom and give timely feedback on their mastery of learning content.

C. Learning Satisfaction

Learning satisfaction can be used to explain the motivation and results of students' participation in learning activities. Using Knowles' research for reference, we define learning satisfaction as students' pleasant feeling of learning activities. Positive and pleasant feeling is "satisfaction" and vice versa is "dissatisfaction" [25]. Long's point of view also supports our definition. He believes that learning satisfaction refers to students' feelings or attitudes toward pleasant learning activities [26]. While studying whether blended learning based on Rain Classroom can achieve learning interaction and learning feedback, this paper establishes the following research models to study whether learning

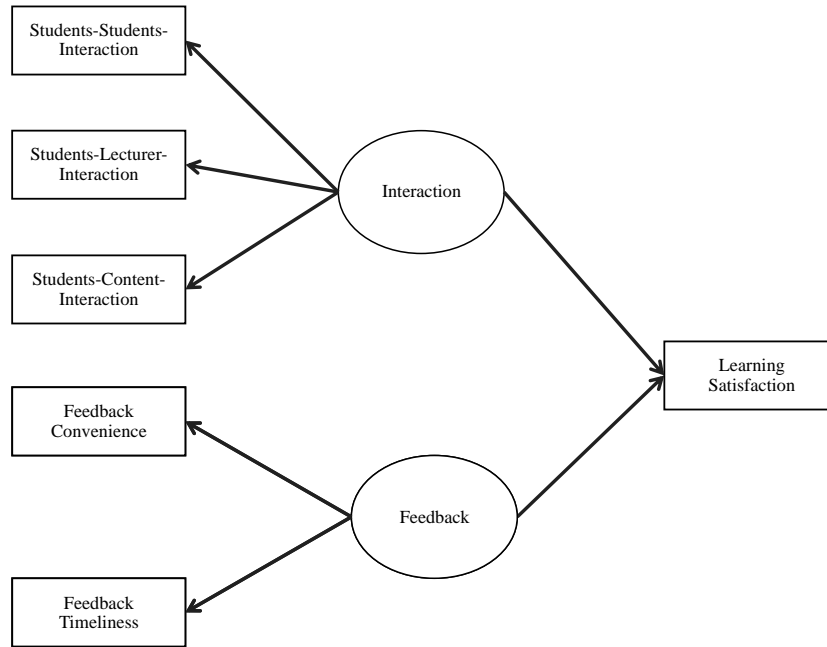interaction and learning feedback can improve learning satisfaction.

Fig. 1. Research model.

So we propose the following hypothesis based on the model we have designed:

- a. Blended learning based on rain classroom can realize students' learning interaction.

- b. Blended learning based on rain classroom can realize students' learning feedback.

- c. Learning interaction has a significant positive impact on learning satisfaction.

- d. Learning feedback has a significant positive impact on learning satisfaction.

IV. RESEARCH METHOD

In order to study whether blended learning in Rain Classroom can achieve learning interaction and feedback for students, and whether it can improve students' learning satisfaction, we chose a university course based on blended learning in Rain Classroom, and designed a questionnaire ("Table I"). At the end of the course, we conducted a questionnaire survey to test our hypothesis.

TABLE I. QUESTIONNAIRE

Research Variables	Question
Students-Students-Interaction	Q1. I can discuss it with my classmates in Rain Classroom. Q2. I can cooperate with my classmates in Rain Classroom.
Students-Lecturer-Interaction	Q3. I have the opportunity to ask the teacher a question in Rain Classroom. Q4. I can discuss the learning content with the teacher in Rain Classroom.
Students-Content-Interaction	Q5. I can get content specific assignments in Rain Classroom. Q6. I can get content specific assignments to discuss in Rain Classroom.
Feedback Convenience	Q7. I can give feedback in Rain Classroom conveniently.
Feedback Timeliness	Q8. I can give feedback in Rain Classroom timely.
Learning Satisfaction	Q9. I feel happy to study when using Rain Classroom.

V. CONCLUSION

The results show that the blended learning method based on Rain Classroom can realize students' learning interaction and learning feedback. Moreover, learning interaction and learning feedback have significant positive effects on learning satisfaction. Rain Classroom is an exploration of blended learning in China. At present, some colleges and universities begin to use Rain Classroom to assist teaching. The enthusiasm of students' participation is very high. The interaction between teachers and students has been significantly improved. The emergence of new mobile technology is helpful to the traditional education industry. The traditional education can make use of the real-time and convenient characteristics of the m-learning to create a new way of education.

REFERENCES

[1] Devlin K. The MOOC will soon die. Long live the MOOR[OL]. <http://mooctalk.org/2013/06/03/the-mooc-will-soon-die-long-live-the-moor/>

[2] Picciano, A. G. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. Journal of Asynchronous learning networks, 6 (1), 21-40.

[3] Moore, A., Masterson, J. T., Christophel, D. M. and Shea, K. A. (1996). College teacher immediacy and student ratings of instruction. Communication Education, 45 (1), 29-39.

[4] Alonso, Manrique, Viñes(2009); Hardless, N ilsso, Nuldén (2005)(Alonso, F., Manrique, D. and Viñes, J. M. (2009). A moderate constructivist e-learning instructional model evaluated on computer specialists. Computers & Education, 53 (1), 57-65.

[5] Bitzer, P., Söllner, M. and Leimeister, J. M. (2013). Evaluating the quality of technology-mediated learning services. In Proceedings of International Conference of Information Systems (ICIS), Milano, Italy.

[6] Dyson, L. E., Litchfield, A., Raban, R. and Tyler, J. (2009). Interactive classroom m-learning and the experiential transactions between students and lecturer. In Proceedings of Ascilite, Auckland.

[7] Moore, M. G. (1989). Editorial: Three types of interaction. American Journal of Distance Education 3(2), 1-7.

[8] Wang Shuaiguo. Rain Classroom: The Wisdom Teaching Tool in the Context of Mobile Internet and Big Data [J]. Modern Educational Technology, 2017, 27(05): 26 - 32.

[9] Lai Zhixin. Design and Application of Hybrid Learning Based on the Inteligent Teaching Platform Rain Classroom [D]. Hunan University, 2018.

[10] Mcauleya, Stewartb, Siemensg.The MOOC model for digital practice[J]. 2010.

[11] Dye A, et al. Mobile Education-A Glance at The Future[J/OL]. [2003-1-15].

[12] SIEMENS G, BAKER R S J D. Learning analytics and educational data mining: towards communication and collaboration[C]//International Conference on Learning Analytics and Knowledge. ACM, 2012:252-254.

[13] Yadira ADLGL，T Sancho VT，Gdmez MG. A typical: analysis of a massive open online coursewith a relatively high rate of program completers[J]. Global Education Review，2015，2 (3):68—81.

[14] Duncan-Howell, J. A. and Lee, K.-T. (2007). M-learning–innovations and initiatives: Finding a place for mobile technologies within tertiary educational settings. In Proceedings of, Ascilite, Auckland.

[15] Sha Man. Today, Do You MOOC? The Free Online Courses at Top Universities Are Rewriting the Future. [EB/OL]. [2013-01-15].

[16] Wessner, M. and Dawabi, P. (2004). Interaktionsunterstützung für die präsenzlehre-szenarien und design. DeLFI 2004: Die 2. e-Learning Fachtagung Informatik, (Ed, Engels, G. S., S.), Gesellschaft für Informatik, Bonn, p. 175-186.

[17] N Cavus，D Ibrahim. M-Learning:An experiment in using SMS to support learning new English Language words[J].British Journal of Education Technology, 2009, (40):78-91.

[18] Omega LDM,PIata R B, Hilera Gonzalez J.R, et a1.Using M-learning on Nursing Courses to Im-prove Learning[J]. Computers Informatics Nursing Cin, 2011, 29(5):311-317.

[19] Jin Yi, Wang Yizhi, Liu Junliang. Hierarchical Instructional Design and Its Practice Based on the Blended Learning Theory [J]. Modern Educational Technology, 2013, (1): 37 - 40.

[20] Michael B Horn, Heather Staker. Blended — Using Disruptive Innovation to Improve Schools [M]. Beijing: China Machine Press, 2015, 53 - 55.

[21] He Kekang. Looking at the New Development of Educational Technology Theory from Blending Learning (I) [J]. E-education Research, 2004, (3): 1 - 6.

[22] Bryant, J. and Heath, R. (2000). Human communication theory and research: Concepts, contexts, and challenges. Lawrence Erlbaum Associates, Mahwah, New Jersey.

[23] Schrum, L. and Berge, Z. L. (1997). Creating student interaction within the educational experience: A challenge for online teachers. Canadian Journal of Educational Communication, 26 (3), 133-44.

[24] Yang Chun. The Influence of Feedback Types on College Students' Academic Achievements: The Mediating Role of Self-regulated Learning [D]. North east Normal University, 2016.

[25] Knowles, M. S., "The modern practice of adult education: Andragogy versus earning and the learning organization: Examining the connection between the individual and the learning environment", Human Resource Development Quarterly, 1970，9(4): 365-375.

[26] Long, H. B., "Contradictory expectations? Achievement and satisfaction in adult learning", Journal of Continuing Higher Education, 1989, 33 (3): 10-12.