Research on Fragmentation and Systematization of Teaching Process Against the Background of Mobile Internet*

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Abstract—**In recent years, the use of mobile Internet has been increasing year by year, and its application in teaching has attracted much attention. In view of this, taking fragmentation and systematic teaching as the research object and combining with the curriculum practice, this paper first classifies the application of mobile internet, then puts forward the application methods of mobile Internet in fragmentation teaching from two aspects of enhancing memory and improving attention, and finally compares and diverges, classifies and summarizes. The mobile Internet will be applied to systematic teaching. In the teaching process, increasing the use of intelligent terminals reasonably can not only enhance students' learning enthusiasm and interest, but also improve students' memory and attention, which is helpful to form a teacher-led, student-centered teaching model.**

Keywords—mobile; Internet; fragmentation; memory; attention; systematization

I. INTRODUCTION

ZTE Electronic Communications Limited defines "mobile Internet" in its "21st Century Mobile Internet Development White Paper": "mobile Internet" refers to mobile users through smart phones, tablets, PDA (Personal Digital Assistant) or other smart terminal handheld devices through "wireless communication" The way to access the network. Among them, mobile phones are the most popular smart terminals. According to the China Internet Network Information Center (CNNIC) issued the "China's 41st Internet Development Statistics Report 2018", by December 2017, China's mobile phone users reached 753 million, mobile Internet users in the proportion of Internet users has increased from 95.1% in 2016 to 97.5%, the proportion of mobile phone users continue to climb. Internet users in China are mainly 10-39 years old, and 10-39 years old account for 73% of the total Internet users. Among them, the proportion of Internet users aged 20-29 is the highest, up to 30.0%. At present, undergraduate students are mostly 19-23 years old, belonging to the group with higher mobile phone use rate. College students are fully capable and interested in using mobile terminals to consolidate and strengthen their professional knowledge.

II. APPLICATION OF MOBILE INTERNET PLATFORM

Through the application of mobile Internet in the teaching process in recent years, the main application methods of mobile Internet include classroom retrieval, micro teaching assistant course platform and information sharing.

A. Classroom Retrieval

The retrieval function of mobile Internet is not only suitable for class, but also plays an important role in the classroom. In the process of teaching, teachers usually throw out some questions for students to think and answer. At this point, it is necessary to combine with the retrieval function of the smart phone terminal, reserve 1-2 minutes for students

to use Android or Apple's QQ, UC and other browsers to retrieve relevant information through Baidu and other websites so that they can express their views and opinions based on the search results. In this process, students can not only improve their autonomous learning ability but also learn and get something.

B. Micro Assistant Curriculum Platform

1) Sign in: The check-in function of the micro-assistant platform can locate the distance between students and teachers, and can complete the check-in process very well. The teacher enters the micro-assistant service number, chooses "my classroom", enters the corresponding classroom, chooses to open the check-in and checks on the GPS, at this time the student can enter the classroom check-in. After checking in, the teacher's mobile phone can check the number of people who have not been checked in, and the computer can count the attendance and attendance.

2) Review of pre-class quizzes: The pre-class quizzes apply to the teacher's review introduction. Under the platform of "micro teaching assistant", you can first select the "answer — add new questions" on the computer, then specify the chapters, questions, question types (single selection, multiple choice, fill-in-the-blank, true or false and short answer questions) and difficulty, and at the same time you can specify the opening time and time limit of the questions. In class, click the answer questions on the mobile phone to open corresponding questions, and organize students to answer the questions through smart phones under the pre-set time limit. In this process, it not only reviewed the main content of the previous class, but also added the interest of the class.

3) Class discussion: Class discussion is applicable to the teacher's question-type introduction, key question discussion and class summary. During the discussion in these sections, most of the questions are answered by raising hands or by name. Only a few students answer the questions, while other students accept the questions poorly. Therefore, the discussion function under the platform of "micro teaching assistant" can be properly combined to give every student in the class a chance to speak. The teacher first creates a discussion topic on the "micro-teaching assistant" computer. Then the students can speak on the mobile phone, or draw a mind map in the form of class assignment, and speak in the discussion group by taking photos. Finally, students' answers can be shown by the projection, and teachers and students can combine different answers for further discussion.

4) Information feedback: The information feedback function of mobile Internet is reflected in the real-time feedback of test results and discussion results on the micro teaching assistant platform. After the review of classroom quizzes, the teacher can check the answer number and correct rate of questions on the mobile phone in time, and review and explain the questions with low correct rate. The

average score can be viewed on the computer, and the students' scores can be calculated and ranked. At the end of the class discussion, the teacher can check the students' speeches on their mobile phones and computers. Through information feedback, teachers can understand students' grasp of knowledge points and make up for the content.

C. Information Sharing

Information sharing on mobile Internet can be applied in and out of class, which is very helpful for students to understand and grasp key contents. In class, in order to improve students' attention; teachers can share some teaching cases with pictures and texts in the WeChat group, which can arouse students' deep thinking and discussion. In the spare time, it is necessary to share WeChat Official Account related to this course, such as in the process of ecological engineering teaching, students focus on the "ecological restoration network", "the mountain the water", "China's ecological civilization". Many of the content promoted is closely related to ecological engineering, natural resources science and soil and water conservation science, and is practical, which is of great help to improve students' professional skills.

III. FRAGMENTATION OF TEACHING PROCESS

The learning quality of students is closely related to their memory and classroom attention. In the fragmented teaching process, according to the Ebbinghaus forgetting curve and the inverted u-shaped curve of attention, the reasonable setting of teaching links on mobile Internet plays an important role in students' understanding and mastering of knowledge.

A. Fragmented Teaching Based on Memory

1) Ebbinghaus forgetting curve: According to the forgetting curve proposed by German psychologist ebbinghaus, the process of forgetting will start immediately after learning knowledge, and the speed of forgetting will change from fast to slow [1]. This curve tells people that forgetting in learning is regular, and the rate of forgetting is first fast, then slow. Therefore, after one day, if you do not review in time, it will be left with about 33.7% of the original knowledge. As time goes on, the rate of forgetting slows down, so does the content of forgetting ("Fig. 1").
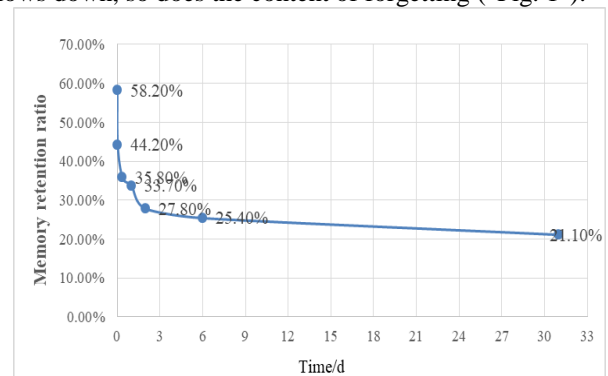

Fig. 1. Ebbinghaus forgetting curve.

2) Mobile Internet strengthens memory: According to the universal memory rule of the ebbinghaus forgetting curve, more efficient memory can be realized. For example, after learning new knowledge, it is needed to review immediately and repeatedly. This can prevent "forget quickly" and realize "remember firmly". According to the experiment, if ebbinghaus memory rules are followed, the retention rate is 98% after one day and 86% after one week. The fragmentation teaching based on mobile Internet can enable students to master the repeated understanding of knowledge by means of pre-class quizzes review, classroom discussion, information feedback and classroom retrieval. The application of mobile Internet in memory-based fragmentation teaching is shown in "Table I".

a) Review before class: Review importing method is the most commonly used method for teachers. When using this method, it can be combined with WeChat public platform such as "micro teaching assistant". It is necessary to select the topic function and set several quizzes under the platform of "micro teaching assistant" according to the key points and difficult contents of the previous class. The type of questions can be set as multiple questions such as multiple-choice, fill-in-the-blanks and judgment questions. Teachers open the answer function and then give the student several minutes to answer the question in class.It not only reviewed the main content of the last class, but also added interest.

b) Classroom discussion: The classroom summary is the last part of the course. Usually students' attention becomes more distracted after two classes. When a teacher or a student summarizes, other students accept it less well. At this point, it is neened to combine the discussion function of "micro teaching assistants" and ask students to make a summary by themselves in the discussion group, such as draw a mind map in the form of class homework and speak in the discussion group by taking photos. In this way, students can not only relieve their physical and mental exhaustion, but also review new knowledge learned in class in time to strengthen memory.

c) Information feedback: Teachers can grasp students' thinking trends and improve students' learning initiative by watching their speeches. The teacher can get the quantitative statistics of the overall grasp of the class after the students submit their answers, which is convenient for the teacher to understand the students' grasp of knowledge points and to supplement the contents with bad grasp.

d) Classroom retrieval: In the process of teaching, teachers usually ask some questions for students to think and answer. At this point, students can use the retrieval function of smart phone terminal to reserve 1-2 minutes for students to retrieve relevant materials in class. In this process, students can think about and apply what they have learned and further enhance their memory of new knowledge.

B. Fragmented Teaching Based on Classroom Attention

1) Inverted u-shaped curve of attention: Attention is a fundamental cognitive process; without it, people would helplessly adrift in an overload of sensory input[2]. The link between attention and stimulation has been widely accepted. The connection between them is central to understanding attention and learning how to control it. When in the absence of stimulation and over stimulation,it is difficult to focus. When the attention is most focused, it is stimulated to the right degree. Psychologists use stimulation levels to describe the level of boredom and excitement. Lucy Jo Palladino proposed in the attention curve that an inverted u-shaped curve can be used to understand the relationship between attention and stimulation[3]. The vertical Y-axis represents attention, and the top down represents attention going from good to bad. The X-axis in the horizontal direction represents the level of stimulation, and from left to right indicates the degree of stimulation from low to high, as shown in "Fig. 2".
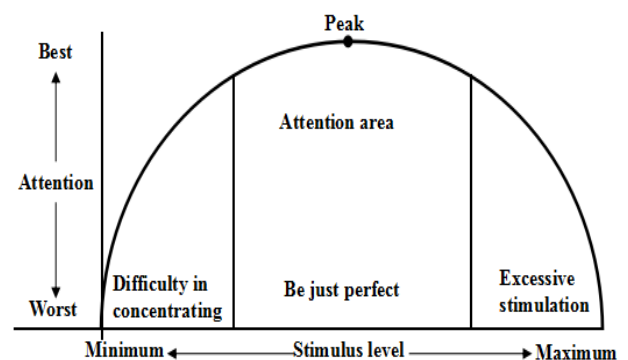

Fig. 2. Lucy Jo Palladino's attention curve.

The upper left end of the line represents lack of stimulation, the upper right end is over stimulation, and both ends of the curve are in the state of lack of stimulation and over stimulation. You get the right amount of stimulation in the center of the curve, and your attention is at its best.

2) Practice of mobile Internet to improve attention: When students are in the attention section, that is, when they are stimulated enough and stable enough, they will listen attentively and maintain their concentration. With effective listening, students understand and master the main class content preferably. Therefore, it is crucial to seize the right moment, select the right attention area, and combine the special tool of mobile Internet to further stimulate students' attention to the best state. The application of mobile Internet in attention based fragmentation teaching is shown in "Table I".

a) Review before class: According to the attention curve, overstimulation can also lead to problems. Students feel nervous when taking exams, but nervousness can easily affect their performance, resulting in poor test scores. Therefore, several quizzes can be set by using the "micro

teaching assistant" and other public platforms. This will not overstimulate the students, but also improve their attention.

b) Classroom discussion: In the absence of stimulation, students tend to wander in class. They are still listening to the general content of the class, but they may miss some details. Therefore, it is needed to combine the discussion function properly under the platform of "micro teaching assistants", so that every student in the class can have the opportunity to speak, and make everyone pay more attention through appropriate stimulation. At the same time, the discussion function of "micro teaching assistants" can also be combined with proper and moderate stimulation to speak or take pictures in the discussion group, which can not only relieve students' physical and mental fatigue, but also enhance students' attention in a pleasant atmosphere.

c) Information sharing: According to the teaching experience, students show high attention to interesting cases, so many teachers will intersperse some classic and practical cases in the teaching process. Teachers can share the relevant case of WeChat Official Account to deepen students' understanding of basic theoretical knowledge, such as "ecological restoration network", "the mountain the water", "China's ecological civilization" and so on. There are many contents that are closely related to natural resources science, ecological engineering and soil and water conservation science. Besides, they are also featured with pictures and articles, which are practical and helpful for improving students' professional skills.

IV. SYSTEMATIZING THE TEACHING PROCESS

Fragmented teaching needs to be combined with systematic teaching to make the knowledge system more complete. In the case of systematic teaching, students are generally encouraged to build a knowledge system by means of comparative divergence, category simplification, reasoning and induction. The application of mobile Internet in systematic teaching is shown in "Table I".

The knowledge system is constructed through comparison and divergence: For example, a conceptual system is constructed by comparing the main concepts in this class with those in the previous classes. At this point, single-item or multiple-choice questions can be set under the platform of the "micro teaching assistants", and students can compare and understand the similarities and differences between different concepts.

The knowledge system is constructed by means of classification: Through systematic classification and generalization, internal relations between things can be established to deepen students' understanding of them, so as to build knowledge system independently and make knowledge be well integrated. Multiple choice questions can be set on the mobile Internet platform of "micro teaching assistants".

Building knowledge system through mind mapping: When an individual's knowledge system is formed, it is necessary to use mind mapping to communicate with others

and to be able to communicate around the subject. It is similar to brainstorming. Through this communication, new knowledge is promoted and stimulated, and the existing knowledge system should be added in time to make it more consolidated. At this point, students can combine with the content structure of the class to construct the mind map independently, and then upload it to the discussion group through the discussion function under the platform of "micro teaching assistants". In the process of repeated discussions among the students, there is a spark of wisdom.

TABLE I. APPLICATION OF MOBILE INTERNET IN TEACHING

Application of mobile Internet in teaching		Fragmented teaching		Systematic teaching
		Fragmented instruction based on memory	*Fragmented instruction based on attention*	
Retrieval in class		✔		
Micro teaching assistant course platform	Sign in			
	Review for the quiz before class	✔	✔	✔
	Class discussion	✔	✔	✔
	Information feedback	✔		
Information sharing			✔	

V. CONCLUSION

The application of mobile Internet in teaching is not limited to information retrieval. The pre-class orientation check-in, after-class quizzes feedback and classroom discussion all contribute greatly to improving teaching quality and efficiency. University education is given priority to lectures, in this process , teachers should make full use of the mobile Internet as a means of teaching, In the process of fragmented teaching or systematic teaching, various application methods of mobile Internet can be combined, which can not only further enhance students' systematic mastery of knowledge, but also promote students' potential thinking ability.

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