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Exploration and Practice of Mobile Interactive Internent Classroom Teaching Based on UMU

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***Abstract*—In view of the fact that the traditional classroom teaching interaction mode is inactive and less effective, in which the students' initiative is not fully involved. With the demand for higher education reform in the Internet era, this paper proposes that UMU should be incorporated with classroom teaching. Through the design of different teaching activities, such as questionnaires, questions and answers, examinations, photographs and so on, we can get a strong sense of accomplishment of teaching and learning. Students' smart mobile phones are used inside classroom to make interactive teaching more effectively, which help student acquire a more effective learning experience and devote more motivation and enthusiasm into learning.**

Keywords-UMU; Mobile Internet; Interactive Classroom; Exploration

I. INTRODUCTION

The article originated from a teaching experience sharing workshop I had about how more university teachers could be encouraged to engage in teaching research and garner extensive results. As we well known, the internet technology is a vibrant and diverse expertise ranging from the management and IT projects, through to the teaching method development of innovative technologies. Correspondingly some mobile terminals such as tablet PC and smart phones are widely used among university students. In order to keep pace with the development of the Internet+ era, and embrace the new era as far as we can, teaching and learning activity under the mobile information environment have to make some changes to break through the traditional classroom methods. Fortunately UMU provides a new way of thinking for classroom teaching innovation.

II. THE PRESENT SITUCATION OF TRADITIONAL TEACHING

As shown in Figure 1, the traditional classroom is mainly based on the teacher's active teaching, together with the passive response from the students. Teachers often pay more attention to the transmission of knowledge through the narration of language and the indoctrination of behavior. In the teaching process, the dominant position of the teacher tends to be prominent. The link presented with teaching information transmission from teacher to students is strong, whereas there is a weak response from students to teacher. Therefore, the traditional teaching mode seriously ignores the emotional factors in teaching, as well as the normal needs of student's psychological development, which seriously hampers the enthusiasm, initiative and creativity of students [1].

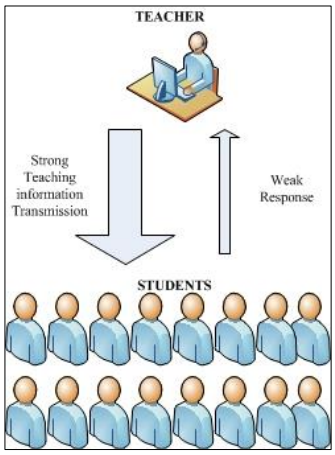

Figure 1. Information Asymmetry between Teacher and Students

III. MOBILE INTERNET AGE CALLS FOR INNOVATION OF CLASSROOM TEACHING MODEL

In the next few years, traditional PCs will be substituted by mobile terminals gradually, which will become the main learning equipment for university students. Mobile self-learning based on smartphones and tablet PCs will become the dominant learning tool for those students. At anytime and anywhere students can organize their mobile learning. Teachers are no longer the only way for students to acquire knowledge. The role of teachers is gradually transformed into helping students solve the problems they need during the learning process. Micro-teaching, as well as supervising and guiding students' learning process will prevail in the future. Students' learning has also changed from passive teaching to active learning. Communication, sharing, homework and learning guidance can also be quickly, easily and simply carried out on mobile devices between teachers and students. The problem of how to use mobile technology to advance the reform and innovation of teaching methods, means and models has become one of the latest and most forefront topics in the creation of higher education teaching.

How to stimulate students' active learning? How to realize mobile teaching interaction between teachers and students? How to help teachers achieve micro-teaching and flipping classrooms? The teaching resources and models of the original

PC architecture do not meet the needs of mobile learning. It is necessary to develop and construct digital learning resources suitable for mobile terminal learning, and explore the reform of campus information teaching mode in the mobile environment. Although the traditional PC multimedia classroom can realize the interaction between teachers and students and the digital learning of students, it can only be fixed in one place, in fixed position and fixed way. The learning experience of students is not good enough, and the interaction between teachers and students is not flexible enough.

IV. UMU Interactive Learning Platform

A. Platform Introduction

UMU is an Internet-based interactive online learning platform developed by Beijing Youmu Science and Technology Co., Ltd. The access link address is http://www.umu.cn. It is a learning platform for knowledge sharing and dissemination. It can connect people with knowledge, accelerate the flow of knowledge, and enable everyone to integrate, share and make achievements. Using this platform, teachers can create activities and courses, so that teachers and students can better interact with each other in teaching, so that students can get better learning experience effectively [2].

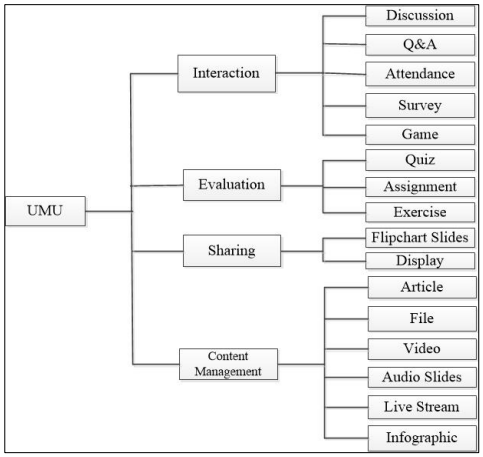

Figure 2. What UMU can do

B. Four Characteristics of UMU Interactive Platform

1) *Simplified operation*: Not only teachers but also students can run the UMU and organize interactive teaching-learning process easily.

2) No need to install, neither register nor login: Before run UMU, you do not need to install App, nor register and login. Users can take participate in interactive learning directly through scanning two-dimensional code with their mobile phones (QQ or Wechat) .

3) Powerful Visuability: Large screen presents a variety of interactive results automatically, and those hot topics can be exhibited in the form of big data and word cloud.

(4) Data Storage function: The dynamic learning data are automatically stored and retained to provide raw data and further your later deep analysis.

C. Main functions

The UMU interactive learning platform can be accessed by personal computer Web terminal or mobile phone App terminal. With UMU teachers can create a new course and design various teaching and learning activities with the web terminal, such as issuing a questionnaire, inputting test questions (supporting multiple-choice questions, single-choice questions and question-and-answer questions) and distribute assignments. Each teaching activity of course can be saved on the students' mobile phone, and it is also convenient for students to consolidate and review the content of classroom learning.

As shown in Figure 2, UMU has four main functions: interaction, learning effectiveness evaluation, sharing and content management.

1) Sharing knowledge: Teachers can issue the courseware, document. It supports various knowledge presentation forms such as graphics, video, audio, micro-lessons, live broadcast, paid question and answer. Students also can share their opinions on one topic with UMU, which can be seen by other students and teachers.

2) Organizational interaction: Through UMU, we can organize many kinds of interaction, such as voting, asking questions, discussing, attendance registration and so on. Through the Internet the traditional classroom has been activated and everyone all is involved into the process of knowledge sharing.

3) Building a learning platform: Traditional e-Learning platform has been surpassed by online mobile learning platform. Learning can happen anytime and anywhere through mobile terminals. Using the pay-as-you-go mode of UMU, a learning platform belonging to the era of mobile Internet can be deployed immediately to make learning more agile.

4) Constructing blended learning projects: The innovative learning mode with UMU has broken the traditional classroom teaching mode and transformed the passive learning of "teacher telling students to listen" into the active learning of "flip classroom". It promotes students to take the initiative to learn, which can greatly improve the quality and effect of teaching. Before and after class, knowledge fragments can be explained through micro-lectures, and students can timely feedback after learning. In the course, the interactive function of UMU can improve students' participation and learning enthusiasm.

V. Exploration and Practice of UMU in the Teaching of Basic Programming Course

UMU can create prevail connection and interaction between students and students, student groups and groups, teachers and students as shown in Figure 3. It helps us construct an intelligent classroom and organize an efficient teaching. In our course teaching, here we take Basic Programming with C language as an example, in which 29 activities were designed altogether involved with 94 participants, including 4 Attendance Registration, 6 Q&As, 2 Surveys, 6 Flipchart Slides, 5 Quiz and 6 Assignments.

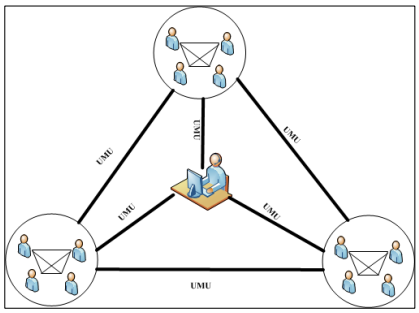

Figure 3. Mutiple Interaction with UMU

A. *Attendance Registrations*

Attendance can be used to collect participant's information while protecting their privacy. You can display a QR code on the big screen for everyone to sign in together, or use the 'share' feature to distribute on social media or print a QR code.

Figure 4. QR code for students attendance registraion

UMU can realize anti-cheating function. When Anti-Cheating Mode is turned on, UMU will pull all learners categorized as potentially cheating together for manual approval. The reasoning will appear next to the learner's name so you can judge whether or not to approve their attendance. If a learner's attendance is approved, they will have successfully signed in. Learners who are pending approval or denied will not appear on the display screen [3].

B. *Q&A*

With UMU teacher can launch an open question conveniently to get the intuitionistic answers responded by students, which can be displayed on the screen visually to demonstrate the key information and high frequently emerged key words in the form of color word cloud as shown in Figure 5. For example, we established a Question on "Q1: Have you ever learned C programming before, or have you ever written code in any language? ". Students gave their answers directly with their smart phones by scanning the interactive QR code.

Figure 5. Key Information presented by Color Word Cloud

On the display screen, the color word cloud generated with the answers is presented. According to the number of keywords mentioned, the color and size of the font can be presented differently.

C. *Surveys*

Survey function enable teachers to design a series of question options for a specific topic, which can be either single or multiple choice, based on which students can make choices correspondingly. Consequently teachers learn about the general situation of students on the subject through feedback provided by respondents.

In Figure 6, we designed two surveys. The results can be displayed visually and immediately, which help us a lot to make a decision on how to organize our teaching task.

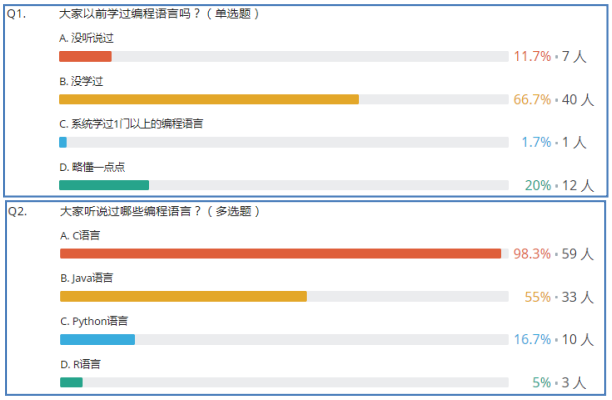

Figure 6. Example of two Surveys

D. *Flipchart Slides*

As a unique function of UMU, Flipchart Slides provides an efficient way for teachers to know students' learning situation instantly. When a teacher arranges a class exercise or group discussion in classroom teaching, he can take a picture of the result of the exercise or discussion by mobile phone, then upload it to UMU platform through Internet immediately, and display it on the projection screen, upon which carry out related teaching accordingly.

In Figure 7, teacher took a photo of a student's writing code and displayed it to all students and made some comments on it as well.

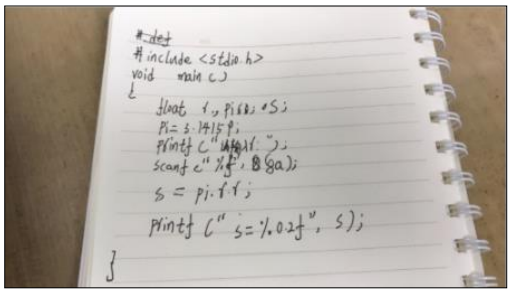

Figure 7. Example of Flipchart Slide

E. *Quiz*

Teachers can arrange classroom tests through UMU platform. They can set front page instructions, time limit, and limit number of retakes, as well as the score distribution of each question. Topics can be subjective or objective. Scores

can be seen immediately after completion of the test and submission. The system automatically graded papers and counted the scores and distribution, such as total participants, average score, highest score, lowest Score.

Figure 8. Statistics of Quiz

Figure 8 shows the statistics of a quiz, including Correct Rate Statistics for Each Question. And Figure 9 shows total test scores for each participant.

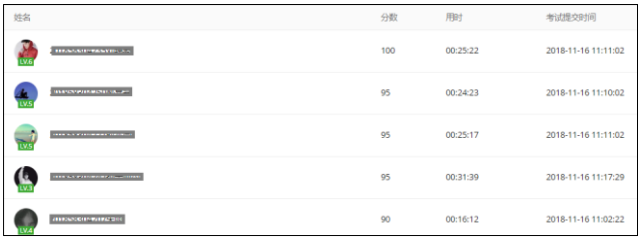

Figure 9. Score of Quiz of Each Student

F. Assignment

You can create a class and distribute assignments to the learners in your class. Learners will receive notifications about their assignments and due dates. Assignment completion metrics will appear here. You can assign items to your classes and customize when notifications are sent out. New learners will not receive previously assigned content. Be sure to assign it to them so they receive notifications. When something is reassigned, learners will not receive duplicate assignment notifications.

Figure 10. Assignments Comments

After students submitted their assignments, teachers can give a credit on it according to the quality as shown in Figure 10.

VI. UMU AND ENGINEERING EDUCATION ACCREDITATION

Engineering education accreditation is an internationally accepted quality assurance system for engineering education, and also an important basis for achieving international mutual recognition of engineering education and engineer qualification. It is a qualified evaluation for engineering specialty in higher education. The accreditation standard of Engineering Education in China is based on OBE (Outcome-based Education). The framework of accreditation is shown in Figure 11.

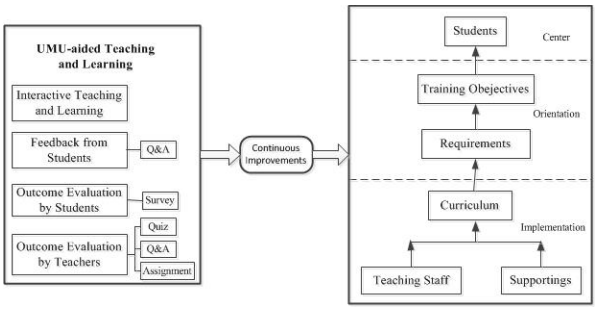

Figure 11. UMU-aided Teaching and Learning Mode help Engineering Education Accreditation Implementation

Other than organize an interactive teaching and learning, we can receive the feedback from students conveniently and make an outcome evaluation by students and teachers with the help of UMU platform. It helps construct a transformation from evaluation of teaching to evaluation of learning, which fully demonstrate the core idea of student-centered of engineering education accreditation, which promote teachers to pay more attention to their teaching by evaluating students' learning outcomes and take feedback into their improvements continuously.

CONCLUSION

Through UMU interactive learning platform, the conventional classroom teaching characterized by one-way, dull, less interaction, single subject can be changed into multi-way, various form of interaction, active and multi-subject classroom. It can effectively solve the problem of students playing mobile phones and doing other things unrelated to teaching in classroom. Teachers and students should be guided to actively embrace the era of mobile internet, and fully enjoy the conveniences brought by interactive learning platform so as to keep pace with the new changes and promote the upgrading and transformation of traditional classroom.

ACKNOWLEDGMENT

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REFERENCES

[1] Li Ronghua. The Times Change of Teacher-Student Relations under the Background of Information Technology Reform. Journal of Seeking Knowledge Guide. 2018, (19).

[2] Guo Wenbo. Practice and Reflection on Teachers'Information Technology Application Training Based on UMU Interactive Learning Platform [J]. Software Guide, Educational Technology. Volume 17, No. 7, July 2018: 27-28

[3] http://www.umu.cn