

Application of Mobile Teaching Mode Based on MosoTeach: Benefits and Challenges

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ARTICLE INFO

Article history

Received: February 07, 2019

Accepted: March 18, 2019

Published: May 31, 2019

Volume: 8 Issue: 3

Advance access: April 2019

Conflicts of interest: None

Funding: None

ABSTRACT

With the development of mobile Internet and the popularity of smart devices, mobile teaching is considered to be a trend of future teaching. As one of teaching softwares based on mobile terminal, MosoTeach enjoys great popularity in China. With the information collected through literature research as well as authors' experiences of applying MosoTeach in classroom teaching, the present paper introduces a mobile teaching mode based on MosoTeach, and addresses functions of MosoTeach, the application of mobile teaching mode based on MosoTeach, and its benefits and challenges. Three benefits are pointed out, which are diversification, personalization and liberalization of learning; timely, all-sided and formative assessment system; and the convenience of collecting data and doing statistic analysis. Meanwhile, there are also some arguments about this mode such as the efficiency of participation, balancing between activities in and out of the classroom, balancing between face-to-face interaction and interaction through MosoTeach as well as the popularization in poverty-stricken areas, and some suggestions are put forward to solve these problems. Teachers should plan and organize the teaching materials well, and differentiate activities according to different phases in which those activities are carried out and keep balance between face-to-face interaction and interaction through MosoTeach.

Key words: Mobile Teaching Mode, MosoTeach, Application of MosoTeach in Classroom Teaching

INTRODUCTION

The era of mobile Internet has come. According to the data provided by Zenithmedia (2017), the primary means of accessing the Internet for most users are mobile devices (including both smart phones and tablets). Mobile devices accounted for 70% of time spent using the Internet in 2017. Mobile Internet use has doubled since 2011, when it accounted for 36% of all of the Internet use.

Mobile terminals marked by smart phones and tablet computers are gradually replacing traditional PC and becoming the main learning devices for college students.

China has 802 million mobile Internet users, with 98.3 percent of them accessing the Internet via mobile phones. Students account for 24.8% of mobile Internet users (China Internet Network Information Center [CNNIC], 2018). The survey of America shows that 75% of American teenagers own cell phones with 83% of 17-year-olds owning cell phones (Lenhart, Ling, Cambell & Purcell, 2010).

The concepts of education and modes of teaching in the mobile era are undergoing profound changes. Teaching resources, teaching modes and auxiliary platforms in the era of PC can no longer meet the needs of mobile teaching. Digital teaching resources and interactive teaching platform for mobile terminals should be redesigned. The core of education - curriculum development - is also changing rapidly with mobile

teaching. The term "Mobile Teaching" refers to a subset of educational technology, distance education and E-learning, that focuses on teaching across contexts and teaching with mobile devices. It is considered to be the teaching mode to use mobile devices to support teaching and learning (Mehdipour & Zerehkafi, 2013). Mobile teaching can carry out real-time interactive feedback in mobile Internet environment with students' Bringing You Own Device (BYOD). In other words, with the use of mobile devices, learners can learn anywhere and at any time (Crescente and Lee, 2011). Hence, it is an ideal supporting environment of micro-lecture and flipped classroom. Terry Heick (2016) divided mobile teaching framework into four parts as follows in Table 1.

MosoTeach can cover almost all the functions listed in the mobile teaching framework mentioned above. A news report programme of China Central Television Broadcasting (CCTV) on Dec 5th, 2017 mentioned a new teaching mode based on MosoTeach in classrooms in the institutions of higher education. Students logged in with their mobile phones and the whole class posted comments and discussed with each other with an APP. A student interviewed in the programme said, "...It greatly aroused our interest in learning and participation in class activities". This APP is MosoTeach developed by Beijing MosoInk Information Technology Company. MosoInk was established in 2012 and entered the education industry

initially through developing E-textbooks. In November 2014, it began to promote its interactive teaching tool (MosoTeach) for classroom teaching, and provide service as an online education platform in China (Zhang Xia, 2017). The company promotes its Big Data management platform for cloud teaching, which provides data analysis and statistics to help educational institutions at different levels to solve teaching and learning problems. In China, more than 5000 educational institutions has signed up to use MosoTeach with more than nine million registered users to date (MosoInk, 2018).

This paper aims to introduce the application of mobile teaching mode based on MosoTeach and discusses its benefits and challenges. Under the general purpose of the research, we plan to answer following questions:

- 1) What are the functions of MosoTeach?
- 2) How to apply this mobile teaching mode in real classroom teaching through MosoTeach?
- 3) What are the benefits and challenges of this teaching mode?

In order to explicit the functions and current state of the application of MosoTeach, the authors collected information through literature research. Taking LanMoYunBan (Chi-

nese Pinyin for MosoTeach) as the key word, a total of 324 papers were found on the website of CNKI (Chinese National Knowledge Infrastructure), which were published from 2016 to 2018. Most of them are quasi-experiments about the teaching effect of the application of MosoTeach in various courses and their results are very optimistic. For example, a comparative study is conducted on the teaching practice with and without MosoTeach in two courses, *Introduction to E-commerce* and *E-commerce and Enterprise Operation and Management* in the University of Electronic Science and Technology in 2017. The results show that using the mobile platform of MosoTeach can help improve teaching satisfaction and students' learning enthusiasm (Wu, Chen & Su, 2018).

For the further study, one of the authors applied MosoTeach in the course of *English Teaching Methodology* in the spring semester, 2019. There are four classes with a total number of 104 students using this APP to study in and out of classroom. The process of application and the students' performance presented in APP were recorded. All the pictures and tables presented are the screen shots or statistic data from MosoTeach client-sides on mobile phone and computer.

Table 1. CLAP: A Mobile Teaching Framework (Terry Heick, 2016)

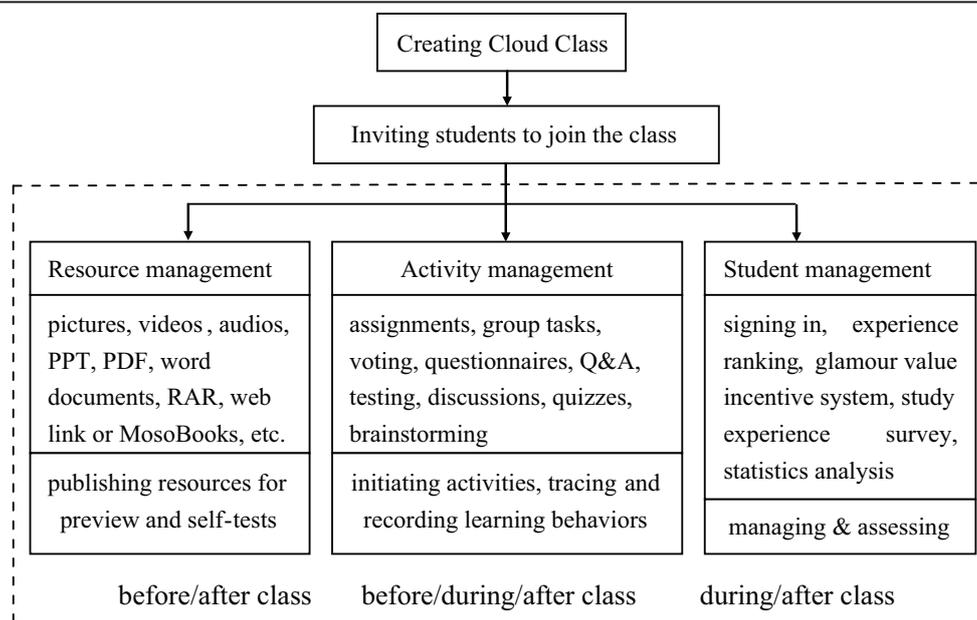
Content: Access & distribution; Personal learning portfolio; Video, documents & conversation.	Personalization: Content, process, or pace; Self-directed pathways; Sync teaching, Maker Education, etc.
Learning Feedback: Peer-to-peer, school-to-school; Alerts & notifications; Adaptive learning algorithms.	Audience: Audience for work (e.g., PBL); Collaboration for inquiry; Authentic community interaction.

FUNCTIONS OF MOSOTEACH

MosoTeach is a mobile teaching APP based on the mobile Internet environment, which can meet the needs of interaction and immediate feedback between teachers and students. It aims to inspire students to learn independently via mobile devices and realize functions of real-time interaction, resource sharing and timely feedback between teachers and students. It provides two versions for downloading - IOS and Android. There are different client-sides for teachers and students.

The platform mainly provides the functions of releasing notices and resources, initiating activities (signing in, voting, brainstorming, in-class testing, examination, etc.), student management and statistic analysis (shown in Table 2).

Table 2. Functions of MosoTeach (Wu, et al., 2018)



It records students' learning behavior in real time through cloud service, and teachers can motivate students with experience values (XP points) so as to realize formative evaluation and personalized teaching.

1. Digital textbook supporting

MosoTeach can support the use of MosoBook, which is different from a paper textbook or an ordinary electronic textbook. It integrates four cutting-edge technologies of rich media, digital publishing, mobile learning, cloud and big data. On the basis of contextualization and visualization of learning needs, it rearranges traditional teaching content with the blending of rich media content and interaction design, and is suitable for smart phones, tablet computers and PC, providing a brand-new extensible socialized learning experience. MosoBook uses streaming digital publishing technology, blending pictures, audios, videos, animations and 3D images with texts, and provides functions like audio-visual learning, testing, self evaluation, bookmarking, notes, annotations, Wikipedia, dictionaries, as well as cloud services such as notes sharing, social learning network, cloud synchronization and teaching resource database. Teachers can track students' learning progress using MosoBooks on MosoTeach and evaluate their learning efficiency.

2. Resources pushing and sharing

Teaching resources can be uploaded, shared or forwarded conveniently. They are directly pushed to students' mobile phones and compatible with a variety of formats. Teachers can also set the time when these resources are to be issued and how much experience value students can get. When students study each resource, the data are recorded in detail in real time. These resources form a database which can be forwarded to different classes quickly. MosoTeach supports many kinds of resources such as pictures, videos, audios, PPT, PDF, word documents, RAR, web link or E-books such as MosoBooks. The resources can be packaged as teaching resource kit to be shared with other teachers.

3. Managing teaching activities

Failing to ensure students' engagement in school courses is the most important and continuing problem for students and teachers (Newman, 1992). Teachers can use MosoTeach to initiate all kinds of activities to engage more students, making the classroom teaching more relaxing, interesting and efficient. These activities can also be used before, during or after class. Here are some typical activities:

Voting/Questionnaire: Instead of traditional paper media, MosoTeach can make voting and questionnaire more efficiently, timely and conveniently. Teachers issue voting or questionnaire via mobile phone, and students complete them on their own phones. The result can be shown immediately on teacher's phone. Teachers can download the data report to carry out further analysis.

Brain storming: Using mobile devices to visualize one's own ideas can improve students' participation in classroom activities, and every viewpoint can be commented on and given "thumbs-up" to motivate the sense of accomplishment.

Discussion/Q&A: Teachers and students can interact with each other at anytime and anywhere. MosoTeach sup-

ports uploading audios, videos, pictures, photos and texts, etc. Answers relating to the question can be displayed or hidden. Excellent Q&A can be tagged and kept in the database.

Timing test: Teachers can use mobile phone to have a test quickly. Multiple setting patterns can meet various test requirements. The feedback of objective test results can be provided immediately. Teachers can build up their own database of the test items which can be imported from Web clients to mobile phone.

Classroom performance: There are several ways of motivating students to answer questions. Students can click buttons on mobile phone to "put up hands" or vie to answer first. Teachers can also choose students randomly or manually according to the ranking of experience value, students' name or participation.

4. Evaluation and statistic analysis

Experience value can be set to each resource and activity and be awarded according to the degree of accomplishment and participation so as to stimulate the sense of achievement, and this system forms the basis of formative assessment. Learning behaviors can be visualized to detailed records or reports. These data can be exported at the end of the course to facilitate assessment, upgrading of the course as well as scientific research.

APPLICATION OF MOBILE TEACHING MODE WITH MOSOTEACH

In the spring semester, 2019, one of the authors applied MosoTeach in the teaching of *English Teaching Methodology*. 104 students in four classes used this APP to study in and out of classroom. The teaching processes are as follows.

1. Releasing pre-class tasks to lead in

Before class, the teacher designs resources and uploads them on the platform of MosoTeach. These resources can be PPT, videos, reading materials, cases, etc. (shown in Figure 1).

After the releasing of the teaching resources, all the students' mobile phones will receive instant messages of notification. The teacher can trace by MosoTeach whether the students have seen the message (shown in Figure 2). Students can finish the tasks with their mobile phones in fragmented time according to the requirements and their interests. As soon as students have finished studying the resources, their behaviors will be recorded and they can get experience value. The teacher can remind them timely according to the list of those who have not seen the messages and resources, which is convenient for the teacher to monitor the students' learning process on time.

If the students have questions during the process of autonomous learning, they can post the questions in Q&A or the discussion module of the APP, which can be answered by either the teacher or their classmates. The student who answers the questions actively can be awarded additional experience value by the teacher (shown in Figure 3). They can also send messages to the teacher privately, and thus they can get support in time. With mobile devices, interaction and communication with the students can be dealt with

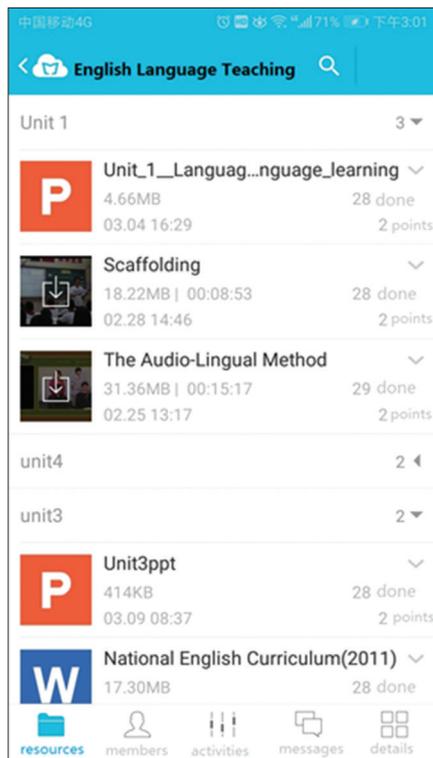


Figure 1. Interface of Resources

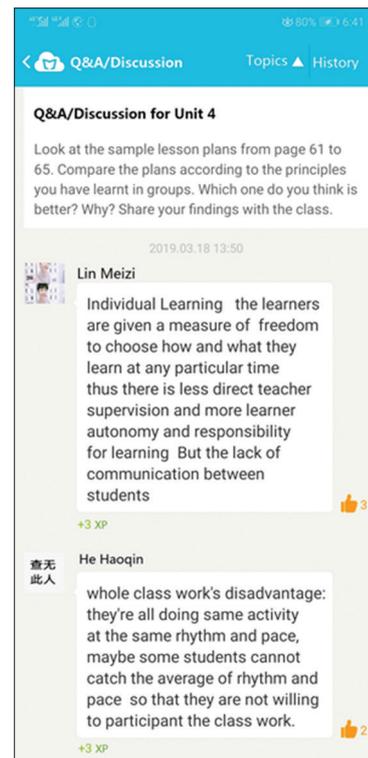


Figure 3. Interface of Q&A/Discussion

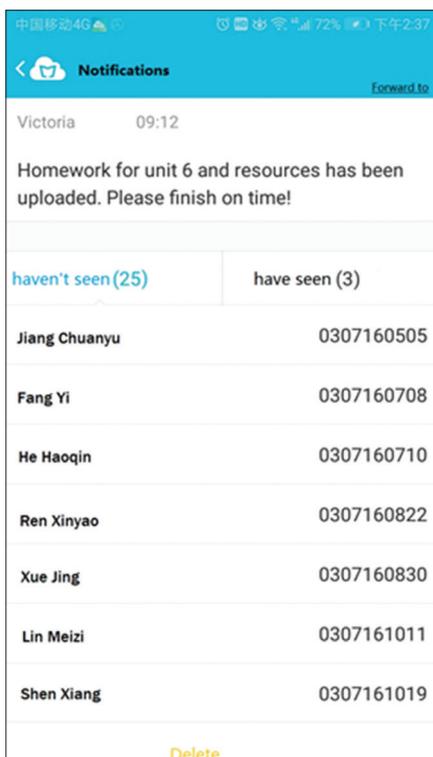


Figure 2. Interface of Notifications

anywhere and at anytime, which is convenient. In this way, the teacher can know the students' needs and difficulties before class so as to decide on the key points and focuses them in face-to-face classroom teaching. By studying resources with MosoTeach before class, the students can concentrate on digesting, consolidating and integrating knowledge in

class (Wang Xi, 2016). The teacher can make full use of the time in class, increasing the time of interaction between the teacher and students, paying more attention to solve common problems and provide more opportunities of producing and practicing to students.

2. Initiating interactive activities to help students internalize knowledge

Terry Heick (2016) contrasts Mobile teaching with traditional face-to-face teaching. He says that the teacher in traditional teaching is a learning leader who distributes content, manages the classroom, provides feedback as well as acted as an audience when the students are thinking and working. However, from the teaching experience of the authors, teacher's roles in mobile teaching mode become various: planner, organizer, resource provider, assessor, etc. Teachers put more emphasis on facilitating learning rather than leading learning. They are no longer knowledge transmitters, but guiders and assistants for their students. The classroom is not a place to listen to lectures, but "to work through problems, advance concepts, and engage in collaborative learning" (Tucker, 2012).

In teaching activities, different modules can be selected according to different content and objectives. Based on the feedback of pre-class tasks, teachers demonstrate or explain further to promote the internalization of knowledge. They can check their students' performance by questions or quizzes. With MosoTeach, they can initiate various activities such as brainstorming (shown in Figure 4), group discussion, voting and testing, which can improve the efficiency of interaction with their students and inspire their interests in learning via mobile devices. The students type in their answers or upload audios of their oral answers, pic-

tures of their written work, PPT or documents with mobile phone. For practical skills involved in the tasks, the students can even upload videos of operation process, which is conducive to improve the students' practical skills. Teachers will award experience value according to the students' performance. All the learning behaviors such as hands up, answering questions, participating in discussion or brainstorming can be recorded and evaluated timely. Evaluation can also be done by peer students or teaching assistants. Teachers can make full use of every minute in class and maximize the opportunities of participation in learning activities.

3. Releasing after-class tasks to help consolidation and get feedback

To consolidate memorization and improve the consolidation of knowledge and skills, teachers can release after-class tasks with MosoTeach, such as homework, tests, voting or questionnaires (shown in Figure 5). They can upload homework on the platform, and the students can download and complete it after class. The assessment can be done in several ways, including grading by teachers, grading by students or the combination of both. Teachers and students can award experience value by directly grading or giving a like (e.g. thumbs up). Generally, Chinese teachers only show the work of top students to set up a model for other students, whereas now all the students' schoolwork can be displayed on the platform of MosoTeach. It is a great improvement for mid-level students because it can increase their enthusiasm. The mutual evaluation among students increases the fairness and objectivity of the evaluation (Shan Shaonan, 2017). Questionnaire survey can also be used as a reference for teachers to collect students' opinions and verify the teaching effect.

FINDINGS AND DISCUSSION

From the literature and our teaching experiences mentioned above, we have found out some benefits and challenges of the mobile teaching mode based on MosoTeach.

1. Benefits of the mobile teaching based on MosoTeach

1) Diversification, personalization and liberalization of learning

In mobile teaching mode, students can build up personal learning portfolio in self-directed pathway. They can study with MosoTeach in their fragmentary time and arrange the place of study independently. Teachers can provide various materials and activities according to students' different levels in and out of classroom. Thus, students have more diversified choices about when, where, what and how to study. Figure 6 shows how different students' personal learning portfolios are. The horizontal axis is the students' ID number, and the vertical axis is the experience values (XP points) they get from different activities. The difference shows that students would spend different time and energy on the activities according to their interests, and hence their learning behaviors are diversified, personalized and liberalized.

2) Timely, all-sided and formative assessment system

Formative assessment is a range of formal and informal assessment procedures conducted by teachers during the

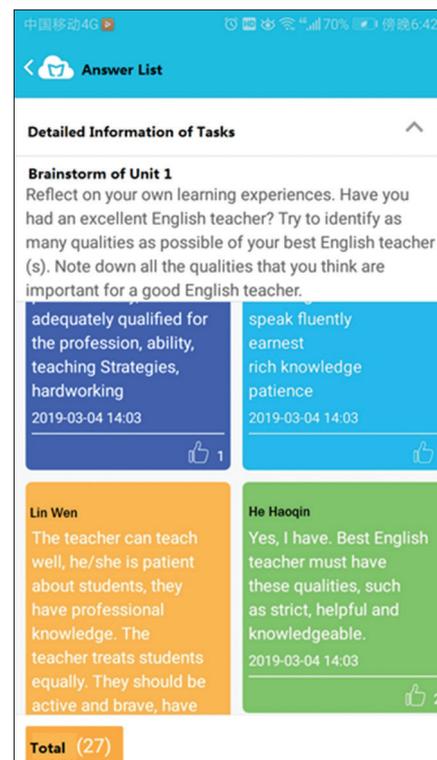


Figure 4. Interface of Brainstorming

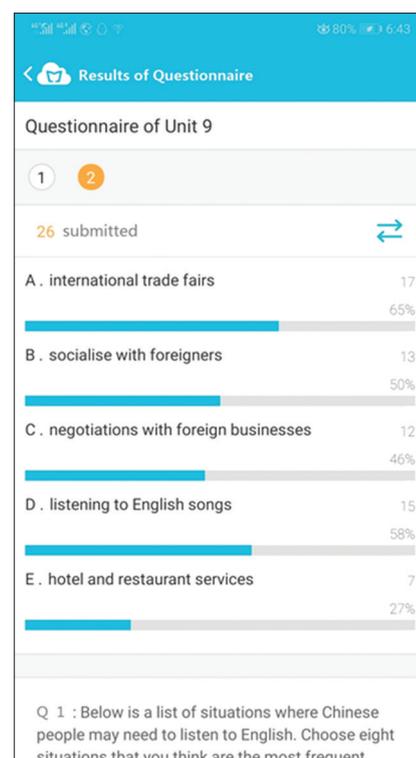


Figure 5. Interface of Questionnaire

learning process in order to modify teaching and learning activities to improve student attainment (Crooks, 2001). The learning processes in the mobile teaching mode based on MosoTeach include: having a basic understanding of learning objectives and requirements by self-study resources in advance; raising question whenever necessary; participat-

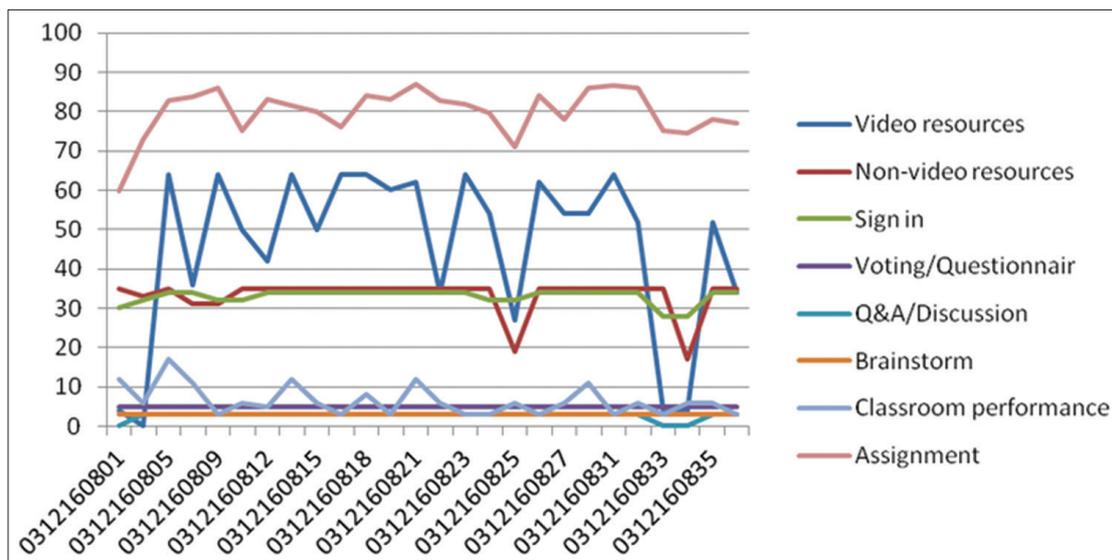


Figure 6. Distribution of Experience Value (XP points) on Different Activities

ing in activities actively in class; and uploading homework timely, etc. All the learning behaviors will be recorded and evaluated in real time. The evaluation system of MosoTech is timely and all-sided during the whole process of learning.

Before class, students who have previewed the resources will be recorded in MosoTech and given experience values. Figure 7 shows the interface of resources learning report including the name and size of the resources, its experience value, when it is issued, key points, requirements, students' names with their ID who have or haven't studied the resources, and the time when students first studied the resources. Teachers can browse the completion degree of the whole class and send messages to remind those who have fallen behind. Students can raise questions to teachers and other students through the "Q&A/discussion" module, or discuss with each other. Anyone who takes part in the discussion or Q&A can get experience values. Teachers can also click the button of "thumbs up" to add points for students who take the initiative to ask and answer other students' questions.

With MosoTech, all the performance and participation in the classroom will be recorded and evaluated by teachers timely. By checking the data reports produced by the APP, teachers can have all the students engaged in by issuing various tasks, such as signing in, brainstorming, discussion, Q&A, etc. Teachers can also provide effective guidance and help according to the information recorded. For example, teachers can assign specific students to answer questions according to their experience value ranking, giving more opportunities to those who lag behind (Figure 8). According to the students' performance, teachers can give feedback and award experience values to motivate them. Of course, there are other ways to organization interaction, for example, one favorite way is that students can be chosen randomly by the system. Teachers can ask them to vie to answer as well.

After class, students can consolidate their learning effects by completing assignments or tests issued on MosoTech. They can also find their strengths and weaknesses from their own learning reports, and compare their performances with

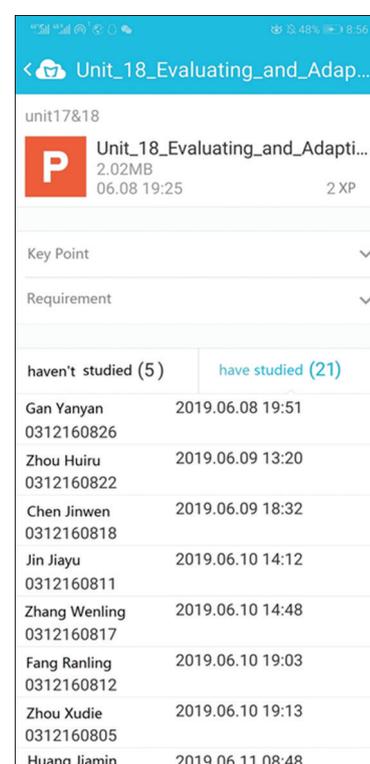


Figure 7. Interface of Resource Learning Report

the average of the whole class and the outstanding students. Figure 9 shows the interface of personal comprehensive evaluation. The blue area indicates the distribution of experience value of student's himself or herself. The green area is the distribution of average experience value of whole class. The red area is that of the outstanding students. The students can also see the details of how much XP points they get from each activity.

3) The convenience of collecting data and doing statistical analysis

In traditional teaching, teachers have to check attendance by calling students' names, grade their work, enter their

grades and differentiate instructions based on the assessment results, and so on. Now, all the time-consuming paper-work can be done by MosoTeach. It is very convenient to collect data and do statistic analysis.

As Figure 10 shows, MosoTeach provides big data service, record students' learning behavior in detail, including degree of completion of resources, XP ranking, ratio of XP in each type of activity, and produce comparative analysis

with others and other class, etc. It collects data and generates learning reports automatically, which is helpful for teachers to analyze students' learning performance so as to control and adjust the teaching process, thus ensuring the teaching effect. Students' learning reports include the vertical comparison of each student's weekly assessment results and the horizontal comparison of assessment scores among students, so as to facilitate students' timely adjustment of

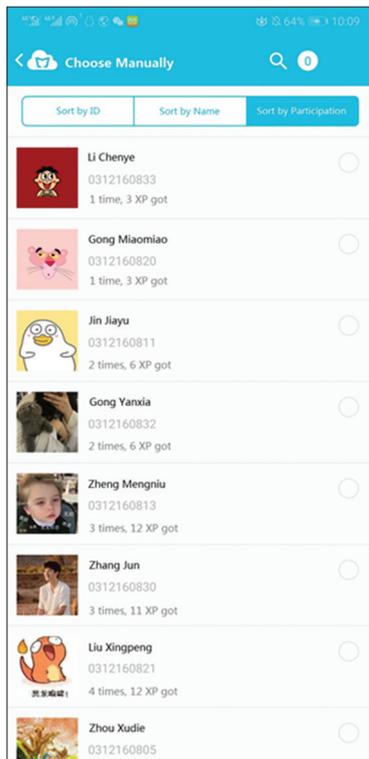


Figure 8. Interface of Choosing Students

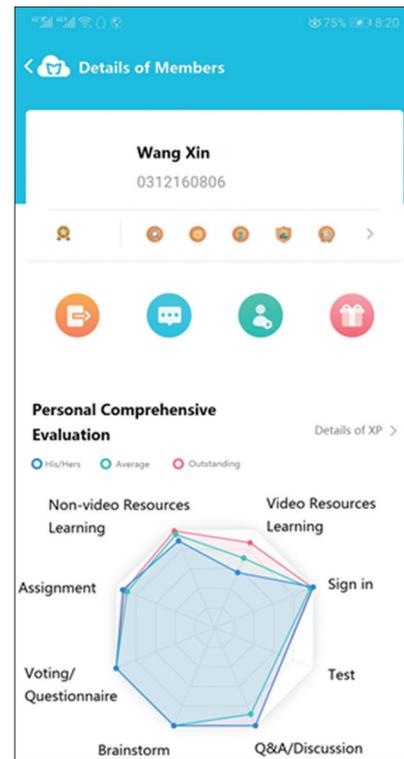


Figure 9. Interface of Personal Comprehensive Evaluation

Learning Report				Luo Yao 0307160818	
Rank	Name (ID)	XP	Details	Items	XP
1	Luo Yao 0307160818	71	click here	Video/Audio	10
2	Shen Xiang 0307161019	67	click here	Non-Video/Audio	13
3	Lin Meizi 0307161011	65	click here	Sign in	6
4	Fang Yi 0307160708	63	click here	Test	-
5	Xue Jing 0307160830	62	click here	Discussion/Q&A	5
6	Jiang Lijuan 0307161107	62	click here	Brain Storm	3
7	Xia Ziyun 0307161227	62	click here	Voting/Questionnaire	-
8	Hong Jiawen	60	click here	Assignment/Group work	20
				In-class Performance	14
				Thumb-up Bonus	0

Figure 10. Report of Learning Performance

their own learning processes. In a word, the application of big data and mobile information technology can help students learn and assist teachers in the teaching process, laying a foundation for teachers' self-improvement of teaching strategies.

All in all, the in-depth integration of online teaching platform and mobile social media avoids the shortcomings of both. The mobile teaching mode based on MosoTeach provides more diversified supports, more interesting interactive activities, more convenient assessment and statistic analysis, more systematic teaching resource management and closer linkage of O2O (online to offline) activities.

2. Discussion

While most of the researchers agree that mobile teaching mode based on MosoTeach improves the quality of teaching with its distinct characteristics and advantages, it should be admitted that functions of MosoTeach still need to be improved. For example, teachers can only input objective questions in the question bank. They can only build up their own database of test items on Web client-side rather than on mobile phone, etc. Besides, there are other challenges to this teaching mode:

Firstly, some researchers and teachers doubt whether the evaluation method based on data (such as experience values) and objective questions is apt to make the participation of teaching activities become mere formality. That is to say, some students may merely focus on the acquisition of experience values, but ignore learning and understanding the teaching materials. In other words, they just click the teaching materials, but they neither seriously study nor have profound thinking of them.

Secondly, teaching materials, questions and discussions can be delivered through MosoTeach before class. To some extent, students may think that they have known all the content they are going to learn in class and they may pay less attention to classroom learning. The problem of balancing the interaction and activities in and out of classroom still exists.

Thirdly, as for the interactions through MosoTeach such as organizing brainstorming and discussion, some argue that teachers and students get together face-to-face but have to communicate through the mobile phone screen. Isn't it putting the cart before the horse? (Chen Jinjing, 2017)

Fourthly, this teaching mode has a basic requirement on popularity and bandwidth of mobile Internet as well as the memory and battery life of smart devices. In some remote poverty-stricken area, people are still struggling for food and clothing. Hence the application of mobile teaching mode is limited in these areas.

3. Suggestions

For these arguments, suggestions may be considered as follows:

1) The resources should be carefully planned and organized. Questions or tasks should be designed to check students' understanding, not just leave the resources to the students without any guidance or requirement. Moreover, now that students pay much attention to experience values, teachers should encourage behaviors of good preparation, active participation or studying hard by offering more experience values.

2) Activities delivered before, during and after class should be differentiated on the difficulty, focus and weight. For example, as for asking questions, after delivering the teaching materials before class, teachers should put forward some questions about the main idea, purpose or basic understanding of these materials. Let students answer the questions all by themselves. If many students have common questions about the same specific problem and the problem remains unsolved after peer feedback, teachers should have this question explained in the classroom teaching, then extend or expand the question, and have students brainstorm or discuss it again. The questions which are to be put forward after class should be more profound or need some creativity or practice.

3) Teachers should keep balance between face-to-face interaction and interaction through MosoTeach. Mobile teaching is not a substitution of face-to-face teaching but the complement and reinforcement of the latter. Interactions through MosoTeach can visualize students' learning process in real time and it is very convenient to collect data and do statistic analysis. However, face-to-face communication engages more human senses than mediated communication (Schement & Ruben, 1993), it is a useful way to improve verbal communication abilities which is one of the teaching objectives in many courses. Teachers should allot suitable time on two types of interaction, thus making full use of different functions of face-to-face interaction and interaction through MosoTeach.

4) As for the popularization in poverty-stricken areas, measures should be taken by the government to ensure the priority of education. With the development of economy and progress in educational awareness of the people, more and more people will realize the importance of mobile teaching and be able to apply it in school education. We should not neglect the fact that the development of mobile Internet technology has brought brand-new changes to the classroom teaching reform. Mobile teaching mode is an emerging teaching mode which will certainly become an important teaching method in institutions of higher education.

CONCLUSION

Mobile teaching is a teaching mode using mobile devices to support teaching and learning. In this paper, the application of mobile teaching based on MosoTeach has been stated on the basis of literature research and the authors' teaching experience. MosoTeach has four functions: digital textbook supporting, resources pushing and sharing, managing teaching activities as well as evaluation and statistic analysis. With MosoTeach, teachers can apply mobile teaching mode in and out of classroom to deliver notices and resources, initiate activities, carry out student management, have progress testing, collect data, and do statistic analysis.

The benefits of mobile teaching mode based on MosoTeach are: diversification, personalization and liberalization of learning; timely, all-sided and formative as-

assessment system; and the convenience of collection data and statistic analysis. This paper also discusses the challenges to this mode such as the efficiency of participation, balancing between activities in and out of the classroom, balancing between face-to-face interaction and interaction through MosoTeach as well as the popularization in poverty-stricken areas. The authors put forward some suggestions to solve these problems. Teachers should plan and organize the teaching materials better. They should differentiate activities according to different phases in which those activities are carried out and keep balance between face-to-face interaction and interaction through MosoTeach. The development of economy and measures taken by the government will contribute to the popularization of mobile teaching. Although the application of this teaching mode based on MosoTeach in China is still in the developing stage, its future development prospects are broad.

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