An Interactive Mobile Learning Platform for Teaching and Learning Chinese Language in Secondary School Environment

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Abstract. With the popularity of smart phones and mobile devices, mobile applications have been reached out to the field of education. Mobile learning not only promotes the interaction between teachers and students, but also improves the students' motivation to learn independently. This paper presents the use of a mobile learning platform to enhance the teaching and learning effectiveness for Chinese Language in a secondary school environment. The mobile application helps students get involved in classroom lessons through immediate interaction. It helps teachers monitor the learning progress and the performance of an individual student. The mobile learning platform involves a news board for announcement of updates news, a discussion board for discussing the academic issues, a quiz system for generating and delivery of multiple-choice and short questions, a scoreboard for displaying the scores of assessments and a whiteboard acted as a synchronized tool of discussion and survey page from the server.

Keywords: mobile learning applications, teaching and learning Chinese Language, secondary schools.

1 Introduction

From the 2012 HKDSE result statistics [1], there were only 49% of examinees obtained level 3 or above for Chinese Language. In other words, half of the examinees failed to reach the criteria of a passing grade in Chinese Language in the 2012 HKDSE. Students generally found that Chinese Language is a boring subject although they are using Chinese Language in their daily life. Unlike science subjects, learning language subjects are found to be difficult for students need special skill to write an article fluently, they need to think from different perspectives and give a correct interpretation, and so on. These skills cannot simply be transferred from the teachers, the students have to read a lot of different learning materials, go through discussion with their classmates and get related experience from their daily life. To learn Chinese well, students need to understand the learning materials, get involved

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and participate in classroom discussion. Students have to read more books and practice writings in their leisure time. Students should keep their passions and motivations to learn independently. In a classroom setting, teachers may find it difficult to arouse students' interests in learning Chinese Language.

There are some existing e-learning websites, such as "A Passage A Day" [2] and "EnglishBuilder" [3] in which different types of exercises are provided for students to supplement their day-time learning. These kinds of e-learning websites just include some academic information for students' self-learning and exercises [4-5]. Although these websites may be useful in teaching and learning, they cannot bring any interactions between teachers and students. Since interaction plays an important role in classroom teaching, another type of learning comes up to fill the gap of e-learning, it is commonly known as mobile learning (or m-learning) [4-9]. Mobile learning is a kind of education which is ideal with the current situation by using mobile devices like tablets and smart phones. It allows learning can be done at anytime and anywhere.

This paper presents the use of a mobile learning platform to enhance the teaching and learning effectiveness for Chinese Language in a secondary school environment. The mobile application helps students get involved in the classroom lessons through immediate interaction. It helps teachers identify the learning progress and the performance of individual student. With the provision of different kinds of class activities, the classroom lesson will become more attractive and interesting.

The mobile learning platform involves a news board for announcement of updated news, a discussion board for discussing the academic issues, a quiz system for generating and delivery of multiple-choice and short questions, a scoreboard for displaying the scores of assessments, a whiteboard acted as a synchronized tool of discussion and survey page from the server.

The application was tested and evaluated by a class of secondary school students. It was found that the mobile learning platform can drift effectively from the traditional teacher-centered into student-centered learning and motivate students to learn Chinese Language in a more interesting way.

This paper is organized as follows. Section 2 describes the design and architecture of the platform. Section 3 presents the implementation of different functions of the platform. Section 4 shows the evaluation results of the platform. Finally, conclusions and future work are shown in Section 5.

2 Design of the Mobile Learning Platform

2.1 Architecture of the Application

This learning platform is based on a client-server architecture, which is shown in Figure 1.

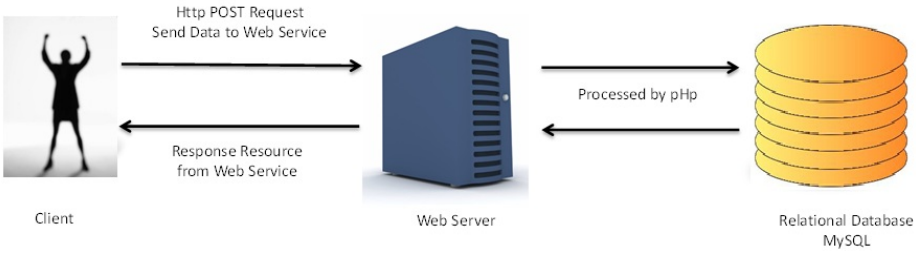

Fig. 1. Client-Server Architecture

The client side will send the HTTP request by post method to the web server. The server side will handle the HTTP request called by clients. MYSQL will be running as the relational database to store the users' information, teaching and learning contents. PHP will be used as the server side language which processed in this development for dynamic web pages and support MYSQL database. All of the functions in this platform will adopt this architecture to send and receive data. However the data in the application are added by the teachers through the web administration page. The architecture of the administration page is shown in the Figure 2:

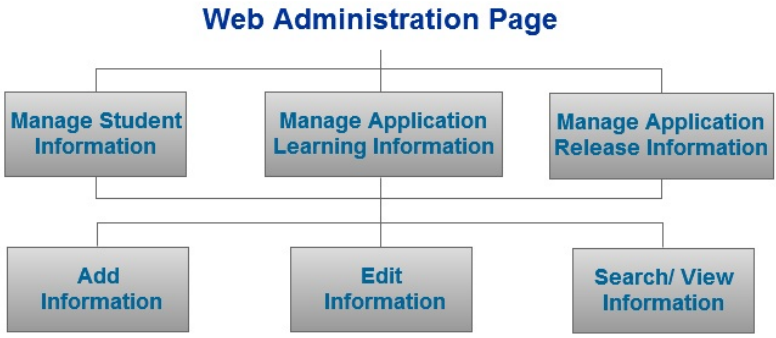

Fig. 2. Architecture of Web Administration Page

Teachers are required to log into the web administration page. After the validation, they can carry out the activities indicated in Figure 2. However, the web administration page is mainly used by teachers only.

2.2 Functions of the Mobile Application

This platform aims to achieve student-centered, efficient and interactive learning, the platform also aims to increase learning motivation and promote self-learning capability. Figure 3 shows the functions of this application.

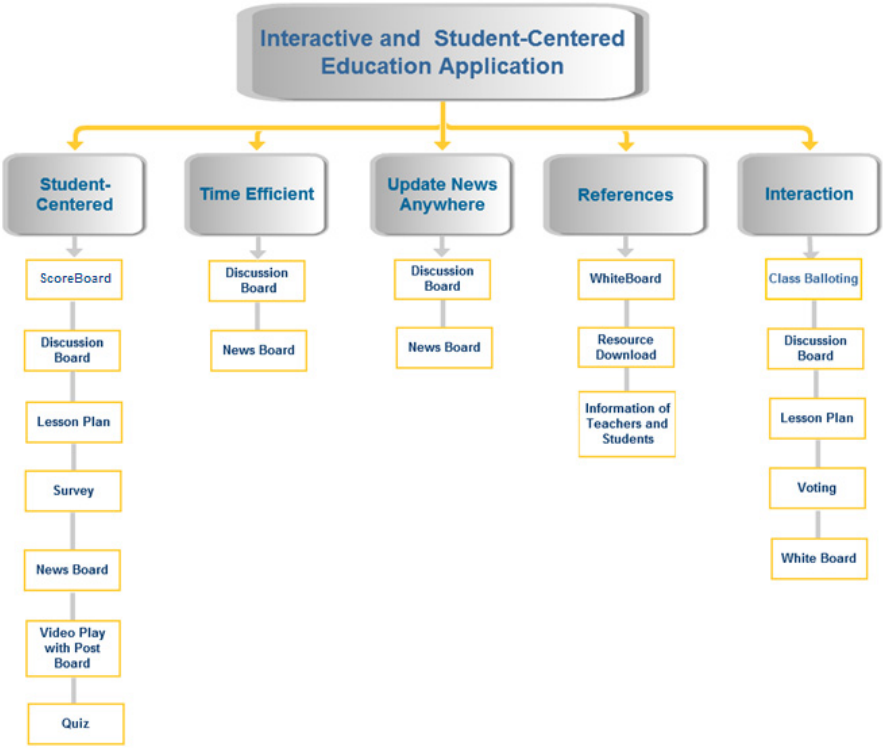

Fig. 3. Functions of the mobile learning platform

Basically, the platform involves a news board for the announcement of updated news, an immediate post board with video playback function for students to ask questions and get participation in the lesson, a discussion board for discussing the academic issues, a quiz system for generating and delivery of multiple-choice and short questions, a scoreboard for displaying the scores of assessments, a whiteboard acted as a synchronized tool of discussion, a content lesson plan with the allowance of downloading related source files and survey page from the server.

3 Implementation of the Mobile Learning Platform

In this section, the main functions of the learning platform will be discussed and some screen captures of the mobile application will be shown. The functions basically are divided into three categories: "lesson", "communication" and "exercises" to fulfill the needs of teaching and learning.

"Lesson" is to allow teachers and students join the activities together in the lesson, for instance draw mind map, create notes by the synchronized tool, and express opinions when watching video.

"Communication" is to provide tools for teachers and students to update news, go through discussion and provide questions and answers about academic issues.

"Exercises" is to deliver writing task, short questions and multiple choice quizzes to students. For short questions and quizzes, the answers will be automatically marked for students.

Once the user is logged in the platform, the following screen (Figure 4) will be displayed. The user can select the functions like "news board", "lesson", "exercises", "discussion board", "survey", "setting" and "logout".

Fig. 4. Menu page of the mobile application

In the following section, some of the selected functions will be discussed. They are "Writing Task", "White Board", "Video Play with Post Board", "Quiz System" and "Short Questions".

3.1 Writing Task

Writing is one of the important components of learning Chinese Language. Nowadays, students are confused with writing because different articles require different styles. In the application, writing task is developed for students to write articles upon teacher's requirement and it is under the exercise page. It is aimed to provide a clear format of a specific type of articles to students before they start writing. After they finished the writing, they can go to the related page and read the articles written by the other students. Figure 5 shows the flowchart of writing task.

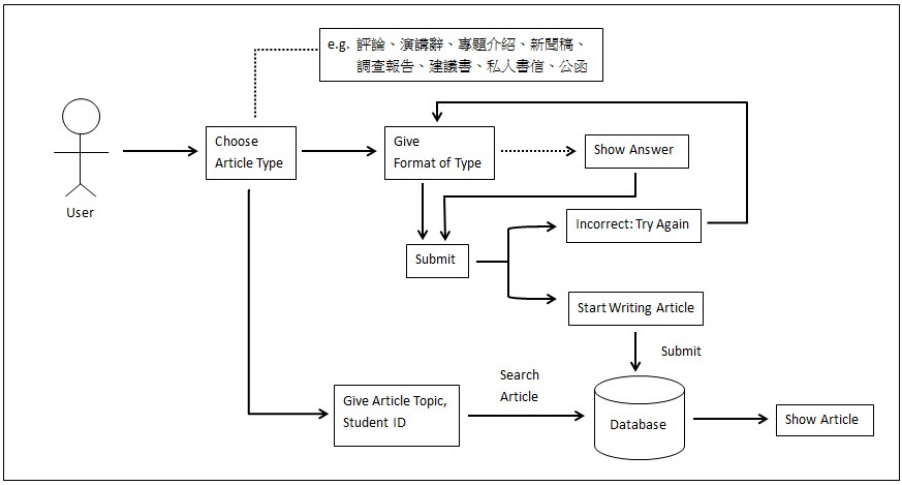

Fig. 5. Implementation of Writing Task

Once the student selected the type of articles, he or she can start writing in the given format as shown in Figure 6. After the writing practice, students can read some pieces of work which are shared by other students.

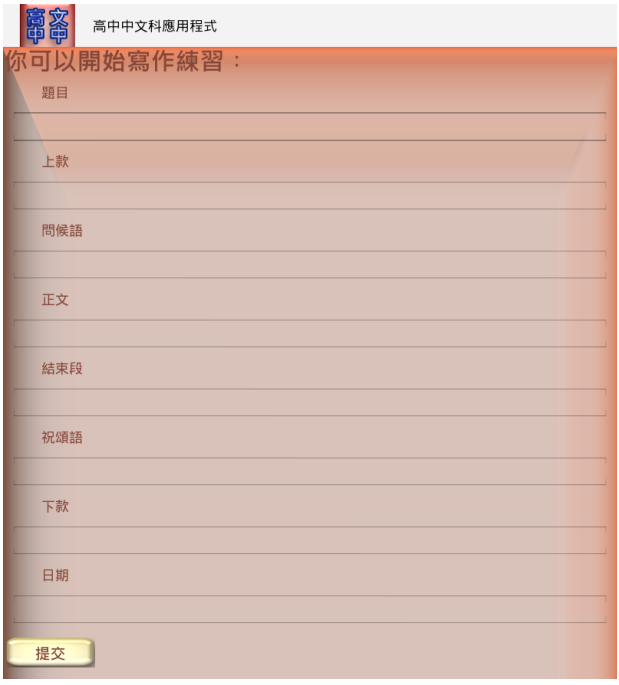

Fig. 6. Screen capture of Writing Task

3.2 White Board

Drawing of a mind map is a common lesson activity in learning Chinese Language. In traditional lessons, a few students may be invited by the teacher and draw a mind map on the blackboard one by one. However, it is not so effective and efficient. An electronic whiteboard is proposed, which can increase the number of students to join and share their work to others. It is one of the tools that improve the lesson interactivity between teachers and students.

The implementation of this function is shown in the following figure (Figure 7):

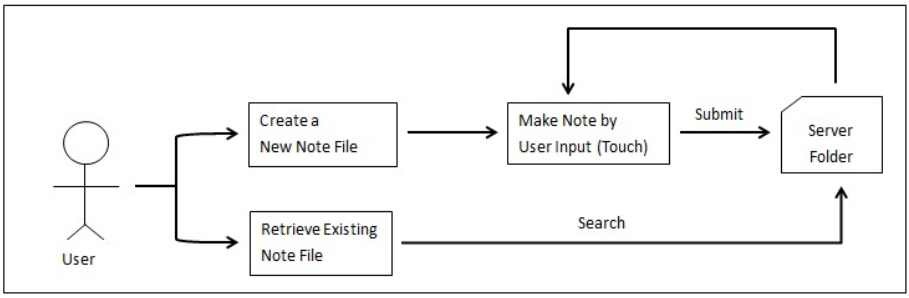

Fig. 7. Implementation of White Board

Figure 8 shows how the conversion of image that uploading to the server through Android application:

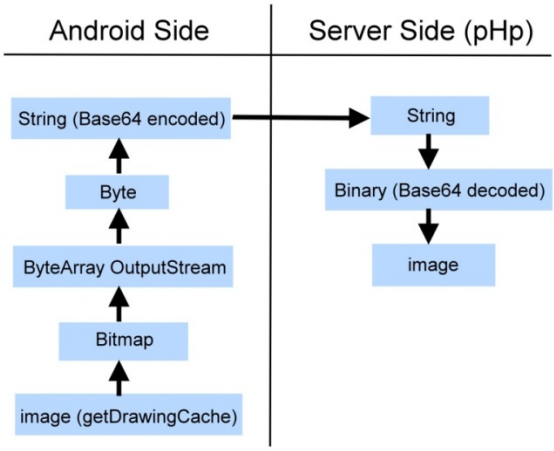

Fig. 8. Conversion of Image

Figure 9 shows the whiteboard in which the words are written by different students in a synchronous way. All other students joining the whiteboard can also see the image simultaneously.

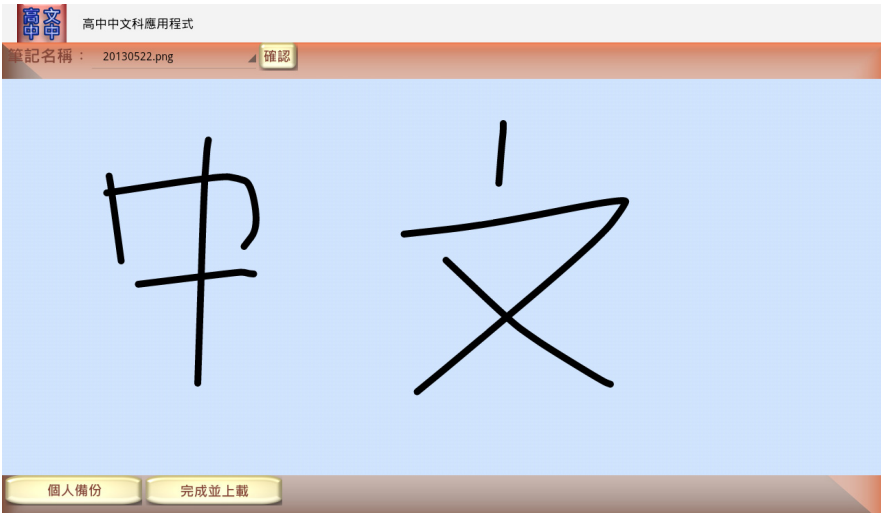

Fig. 9. White Board: words written by different users

3.3 Video Play with Post Board

Listening and speaking are the difficult parts for students to practice in schools. Because of insufficient practice, some students got poor results on the listening and the speaking papers in public examination. Teachers may not put much time on listening and speaking. Although teachers will give chance to express opinions after listening of a record, only one to two students can be able to join this activity. Expressing opinions can also be a way for students to learn Chinese Language.

The implementation of this function is shown in the following figure (Figure 10):

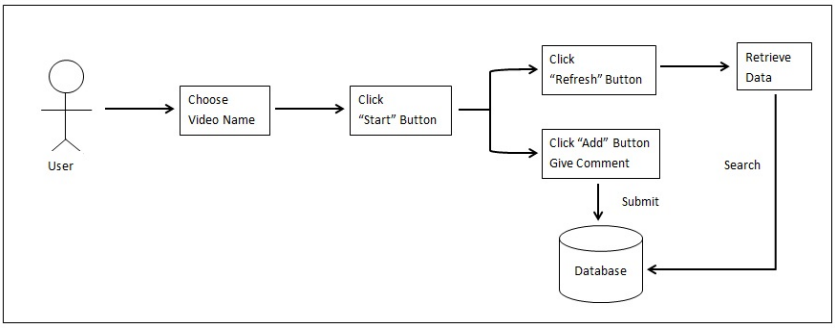

Fig. 10. Implementation of Video Play with Post Board

Figure 11 shows the screen capture of video play with post board. When the video is playing on the left hand side of the screen, students can carry out discussion on the right hand side simultaneously. This function arouses more discussion in the classroom.

Fig. 11. Video Play with Post Board

3.4 Quiz System

Self-revision is very important for students, especially senior form students, since it can address whether they understand and quickly remember the concept. Although multiple choice questions are seldom used in Chinese Language, it can still play a role. This quiz system can mark the answers automatically and students can redo the quiz as revision. Students can use their spare time to do revision without teachers' help. Figure 12 shows the implementation of this function.

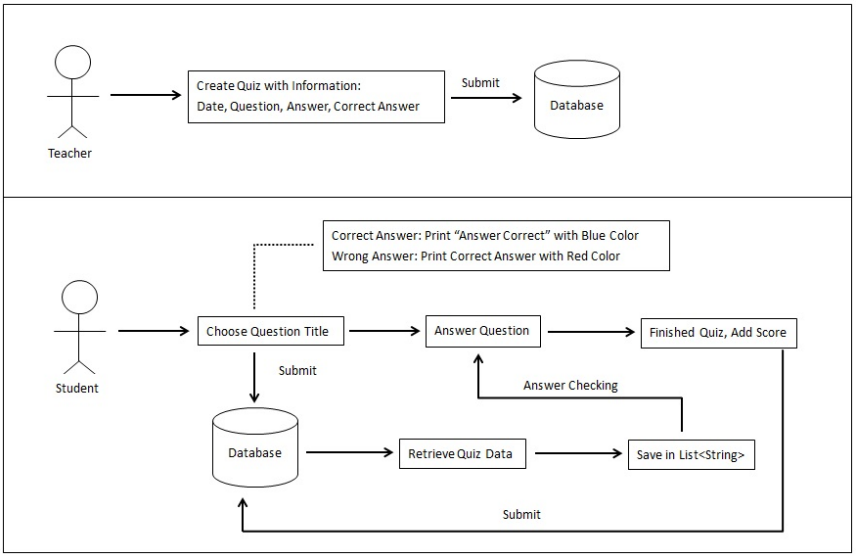

Fig. 12. Implementation of Quiz System

Figure 13 shows the screen dump of the Quiz System, in which the questions will be marked automatically and answers will be given to student for revision purpose.

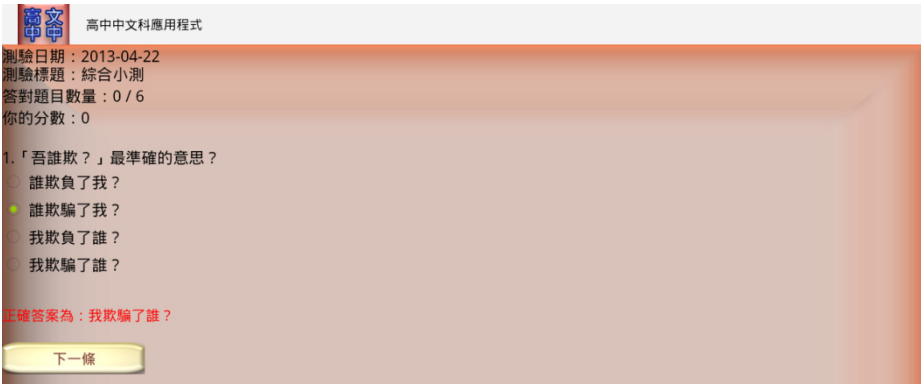

Fig. 13. Quiz System: Incorrect Answer

3.5 Short Questions

Other than multiple choice questions, this application also provides short questions for students to practice during their leisure time. Students find difficult to know the key points or keywords needed on the question, they are usually given a bulk of words but do not address the concept of the question. This function is to address the key words from the students' answer, students can learn from the answers and the provided keywords. Figure 14 shows the implementation of short question.

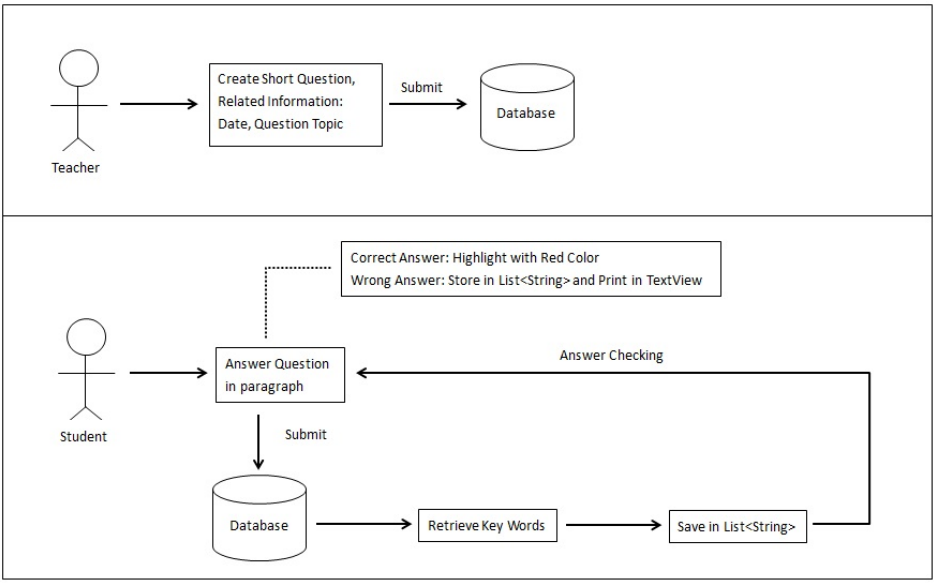

Fig. 14. Implementation of Short Question

3.6 Other Functions

Besides the above five functions, the platform also includes other functions such as Class Voting (Figure 15), Discussion Board (Figure 16) and Score Board (Figure 17), etc.

Fig. 15. Class voting

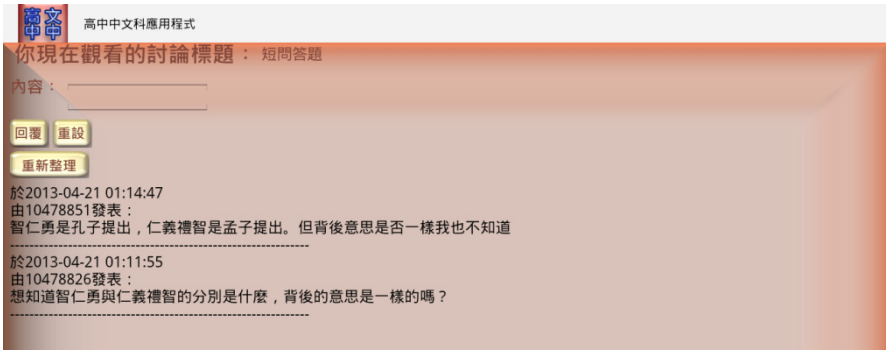

Fig. 16. Discussion Board

Fig. 17. Score Board

4 Results and Discussion

Section 2 describes the design and architecture of the mobile platform and the web platform, some of the functions in the application are mentioned in Section 3. This mobile learning platform was evaluated by the staff, teachers and students from a secondary school in Hong Kong called Christian Alliance S W Chan Memorial College. There are eighteen people invited to evaluate the application and fill in the questionnaires. Among these eighteen people, four of them are the technical staff and programmers, eight of them are teachers and the remaining ones are the students from the same secondary school.

Questionnaires were given to the users to obtain views and suggestions of the mobile learning platforms. The purpose was to recognize any improvements or modifications which can provide a better application to the users. Users were needed to fill the questionnaires which are divided into three areas: achievement of purpose, functions and satisfaction.

The first six questions are related to the aim and objectives, users can choose one answer from four given choices, they are "Yes", "No", "No Comment" and "Others".

Table 1. Results from Question 1 to Question 6 in Questionnaires

	Question	Yes	No	No Comment	Others
1	Can the platform successfully increase the interactivity between teachers and students in the lesson?	15 (83%)	1 (6%)	2 (11%)	0 (0%)
2	Do you think students have rights to express opinions to teachers?	15 (83%)	0 (0%)	2 (11%)	1 (6%)
3	Can this application improve the students' motivation of students?	10 (56%)	1 (5%)	3 (17%)	4 (22%)
4	Can this application increase the students' opportunity of self-learning?	11 (61%)	1 (6%)	2 (11%)	4 (22%)
5	Can this application successfully provide a learning platform anywhere and anytime to discuss academic issue?	18 (100%)	0 (0%)	0 (0%)	0 (0%)
6	Do you think the functions in this application are enough for teachers and students to use in lessons?	12 (67%)	3 (17%)	2 (11%)	1 (5%)

From the above table, it is found that 100% of the users agree this application can provide a learning platform to discuss academic issues at anytime and anywhere. Also more than 80% of users believe this application can increase the interactivity and be more student-centered in the lessons. However, nearly less than 60% of users believe this application can increase the students' motivation to learn and provide an opportunity for self-learning.

5 Conclusions

From the evaluation results, the users generally agreed that this mobile learning platform was a student-centered, efficient and interactive application for teaching and learning Chinese Language in a classroom setting. However, from the users' evaluation, the application can only partially increase the learning motivation and self learning capability of the students. Future development works of the learning platform include increasing the interactivity level in the lessons with discussion board, class voting results, opinions expressed during the video play. The overall layout of the application can be improved to be more attractive and fully use the space of the screen.

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