THE EASILY-HANDLED SYSTEM SYNCHRONIZING DATA RESULTS ON MOODLE FOR IOS AND ANDROID PHONES

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ABSTRACT
This paper presents the application software for iOS and Android devices. The iPhone and Android phone are popular among students. Users of these devices install various software applications. We focused on the effectiveness of repetitive learning for earning a license in a specialized field and built a system providing consecutive learning environments by utilizing digital tablets. Our system server has Moodle installed. The students access this system and use learning materials via PC Web-browser. On the other hand it is not applicable for mobile devices users to use these materials as they use touch panels. Therefore we have developed application software targeting for touch panel uses. MoodleHQ released "My Moodle" native apps for iOS. This software is designed for synchronization of learning contents. Our system differs from others in that synchronization of learning result data. Our system has two advantages: 1) The application for mobile tablets automatically gets learning contents from the network. The student is able to use the materials repeatedly by the mobile device. 2) This application sends learning records to the server. Accordingly students are able to keep learning consecutively via either PC Web-browser or mobile devices.

KEY WORDS
e-Learning, Moodle, iOS, Android, Mobile

1. Introduction
Currently, there has been an increase of various WBT systems such as WebCT and Moodle. WBT is a very convenient tool for the learner, because he/she can learn not only at school but also at home. However, a WBT system is possible to be accessed by only using PC Web-browser. If a mobile tablet can access it, chances of self-learning will be expanded. For example, Kevin examined education use of mobile devices[1].

We investigated an automatic question generation system[2][3]. This research aimed to develop an automatic question generator to realize the continuity of learning via both PC Web-browser and iOS devices. The practice exercises are pre-training for the examinations of CompTIA Strata IT Fundamentals, CompTIA A+ and Ciscosystems CCNA. In this study, we have further improved from the previous study[4].

2. System Design

Figure 1 shows our system overview. Our system has server. This server is running Moodle. The learner study Moodle contents using PC. PC gets practice exercises from network. Therefore, it is necessary to connect PC with the network. On the other hand, the application software that we developed is installed on mobile devices. The application software contains practice exercises. Therefore, the learner is able to study in standalone.

3. Software

Figure 2 shows a title screen of our software application under development. This software is also compatible with what you like multiple-choice practice exercises.
Figure 3 shows a screen that exercises solving learning. Figure 4 shows same practice exercise by PC. (Question sentence of Figure 3 and Figure 4 is “Which is the smallest optical disk storage?”)

In a general, the mobile devices are installed browser. However, when accessed through a browser interface for the PC as not suitable for the operation of the digital tablets. Therefore, we developed software for the mobile devices in Figure 3. This software is using Moodle’s data into a form suitable for the mobile devices. With this software, students learn as well as PC and either with mobile devices.

In addition, we describe our exercise data. It is very complicated if a PC use the different data sources from that source a mobile devices uses. For solving this problem, we adopt Moodle-XML for data format. Of course Moodle is able to read Moodle-XML. Our software is able to read Moodle-XML as well. As a result PC and mobile devices use same practice exercise data. Figure 5 shows overview. When we change or add server data, PC and mobile devices use new practice exercises.
3. Synchronization of Result Data

The result of learning using the PC is written to the database via Moodle. However, as a result of learning in a stand-alone device, it remains stored in the device. Therefore, our software is synchronized with a function of the learning results. It is impossible to write database from outside network. If you want to write to the database the learning results, must be processed in the server. For this purpose, we analyzed a database of Moodle and developed a WebAPI.

This WebAPI is written by PHP. This WebAPI has been placed in the Moodle server. Then, the learning result of the mobile phone is sent to this WebAPI. This WebAPI receives the learning results from and writes Moodle database. Figure 6 shows WebAPI overview. Figure 7 shows overview.

4. Conclusion

There are four features in our system.

1. The learner is able to study anywhere by PC or iOS devices.
2. Maintenance free because this application software updates practice exercises from network.
3. The practice exercises of this application software and Moodle are shared. For this reason, Making practice exercises cost is very low.
4. Our system is able to synchronize the learning result of PC and mobile devices.

MoodleHQ released "My Moodle" native apps for iOS. Figure 8 shows screen of My Moodle.

![Figure 6. WebAPI overview](image)

![Figure 7. database synchronization](image)

![Figure 8. screen of My Moodle App](image)
develop our software for consecutive learning environments.

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References