

A Study of Learning System for Smart Learning using BYOD

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Abstract. The purpose of this thesis is to develop the smart learning system possible for interaction and feedback by using BYOD between one teacher and multiple learners. The developed system is configured with application for tablet PC of teacher, server, program of electronic lecture desk and application for smart phone of students. Clients exchange data by using server and wireless communication and enable the real time interaction and feedback between learners and teachers or between learners. This system has the strength in using the devices already in use and it also may evaluate the class contents and feedback immediately as well as finding out the devices already in use. In addition, the real time interaction and feedback has the strength in enhancing the level of interest for learners on learning.

Keywords: BYOD, Smart Learning, App

1 Introduction

With the recent high dispersion rate of individual IT terminals, such as, smart phone and tablet PC, interest on BYOD (Bring Your Own Device) has been increasing on daily basis. It means the facilitation of individual IT equipment as the auxiliary means for work undertaking while using the general PC provided by business for major work terminal as a new trend of facilitating individual IT equipment for work affairs and it is facilitated as an educational tool [1]. As such, following the advancement of internet communication equipment and technologies, there are e-Learning, m-Learning, u-Learning and others that would be linked to education. In addition, with the emergence of smart phone in recent days, there are efforts to facilitate the foregoing in education [2].

The Ministry of Education, Science and Technology has operated the digital textbooks on pilot basis for promoting the learning effect since 2007 and it has been expanded for students in nationwide. Therefore, the pilot schools have structured the facilities, such as, tablet PC, electronic blackboard, tap and others, and through the faculty training, it has implemented education on method to use and teaching-learning method [3]. However, together with the digital textbooks, contents that may use smart

phone for education have been developed, but contents that may be used in the education field have been greatly lacked [4].

Therefore, under this thesis, BYOD has been facilitated as much as possible to develop the system that is available for interaction and feedback for teacher and students. Followings are the strengths to earn by using this system. First, the devices that learners and teacher use may be used as much as possible. Second, by developing and applying the evaluation system to find out the level of understanding on class contents, the level of understanding on class of learners would be found out. And, third, by enabling the real time evaluation and feedback, it may heighten the level of interest on learning and enable coaching and repetition for each level.

2 Theoretical Background 2.1

Smart Learning

Recently, the Ministry of Public Administration and Security [5] defines the smart learning service as the ‘new education service converged with e-learning new technology and smart device of smart phone or tablet PC’ [6],[7]. Accordingly, Roh Kyu-sung (2011) [8] arranges several studies to define the concept of smart learning as in Table 1.

Table 1. Sums up the researches on the concept of electronic learning.

Division	Concept & Characteristics
e-learning	<ul style="list-style-type: none"> • Electronic means, learning that uses IT and radio & broadcasting technology
m-learning	<ul style="list-style-type: none"> • Learning that uses a notebook or mobile device, a type of learning that is not restricted by time or place but uses the wireless internet, • A form of e-learning inducing mobile technology to e-learning
u-learning	<ul style="list-style-type: none"> • A mode of learning integrated with ubiquitous computing technology, learning that can be conducted anytime, anywhere even without a PC only by connection to the internet • No time or space limitation, using various multimedia materials • Customized education considering each individual's level • Providing self-direction learning environment
Smart learning	<ul style="list-style-type: none"> • Student-centered, self-directed, interaction, intelligent, informal learning, and a sense of reality, etc.

2.2 Mobile Internet

Mobile means the ‘one with mobility. Mobile is the wireless Internet that is based on the technology to forward and receive the information by linking to internet and other diverse data communication network under the wireless environment [9].

The implication in mobile has the concept of 'mobility' other than the implication of 'wireless' in details. In general, the mobile Internet is defined as the Internet through the mobile terminal that includes the 'mobility'. For the strength of mobile

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Internet, it embraces mobility, approachability, expandability and promptness. For characteristics of the mobile Internet, it is shown as in Table 2[10].

Table 2. Characteristics of mobile internet.

Division	Characteristics
Ubiquity	• Properties that can receive real-time information from anywhere
Reach	• properties that can access from anywhere without the constraints of time and space
Security	• Properties that ensure the security and safety
Convergence	• Properties that simplify the communication tools
Localization	• Properties at a specific point in time where the user's current location is unknown
Instant Connectivity	• Properties that can navigate the necessary information within a short time
Personalization	• Mobile users personalized and differentiated customer service

3 Design of system 3.1

System Configuration

This system is configured with the system as the model that is linked for server, PC, tablet PC and smart phone through wired Internet and wireless Internet (WiFi). (Fig. 1) displays the environment for the system as the model.



Fig. 1. System configuration

The electronic lecture desk and beam projector are displayed on each classroom that the design and realization parts are developed for server and tablet PC for the application to be used by teacher, application to be used by learning on smart phone, and communication for the above three.

The teacher client (tablet PC) makes the questions for learners to send to the server. The questions received from the teacher from the server are saved on the database. The server forwards the questions received from teacher to learners who are linked to the server. The learner client that received the questions turns into the question-solving screen. From the question-solving screen, learners read the questions and input the answers. On the basis of answers inputted, result on questions is forwarded to the server. In the server, the result forwarded from learner client is saved on the database. When the teacher requests the result of learners to the server, the server inquires the result from DB and forwards it to teacher client. In addition, the result returned in request for the result inquiry to the server from the electronic lecture desk PC is shown from the project.

3.2 Sequence Diagram

The sequence diagram of the system is shown on (Fig 2).

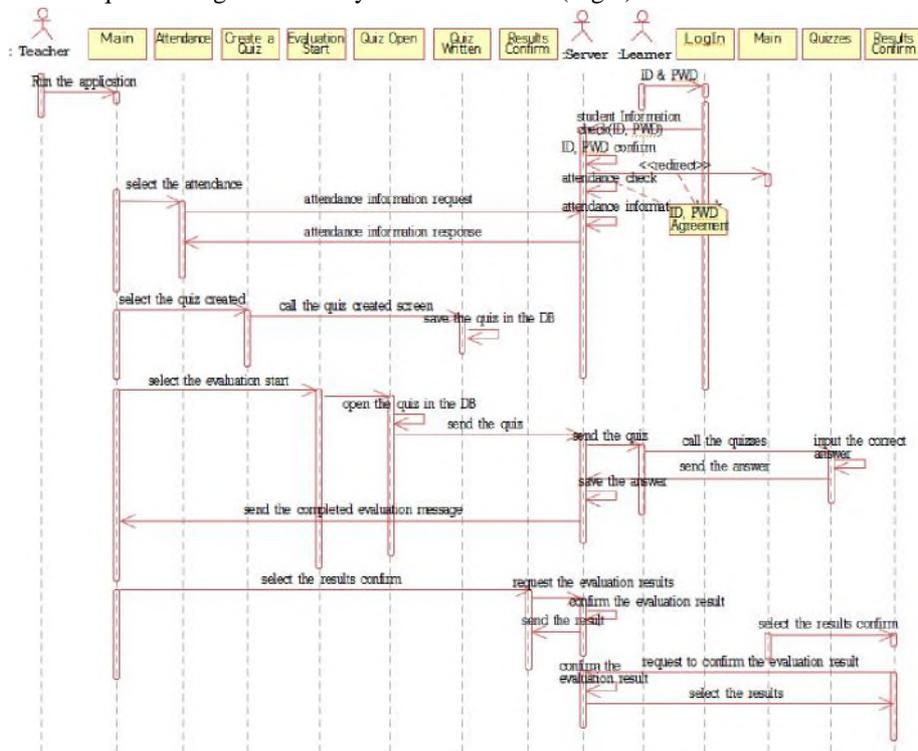


Fig. 2. Sequence diagram

First of all, learner has to log in through inputting the ID. When logging in, the student ID number and password are sent to confirm the learner information of the server. When the student ID number and password are the confirmed, the approval

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information is sent to the learner and record the attendance. After logging in, it turns over to the main screen to stand by.

The teacher executes the application and prepares the questions by selecting the 'question preparation' menu from the main screen menu. The prepared questions are stored in the question DB in the tablet PC.

In the event that evaluation is implemented in class, the 'evaluation start' menu on the main screen is selected to retrieve the question list of the question DB. Applicable questions are selected from the question list to send to the server. The server with the questions is linked to the server through logging in to send to the learners standing by on the 'm4'. The learners received of questions from the server are converted from the 'm4' to the 'question-solving' screen. Answers to questions are prepared and sent to the server. The server that received the answers from the learner stores the answers to the result information DB. When the answers are received from all learners, the server sends the 'evaluation completion' message to the teacher since all learners completed the question-solving. When the evaluation is completed, the teacher selects the 'result view' menu from the m4 to request the server for the result in order to confirm the result of the learners. The server that received the request on the 'result inquiry' from the teacher inquires the 'result information DB' to send the evaluation result to the teacher. The teacher obtains the result from the server for confirmation.

4 Conclusion

The feedback on learning activities is very important in education. In a case where the teacher provides feedback on learning to the learners, it has higher level of understanding on classes as well as enhanced learning desire for the learners compared to the case of providing no feedback. On the basis of the foregoing, the feedback system has been developed for the learners to use the smart phone to enhance the interaction anywhere and anytime and reduce the level difference for the learners.

This system is configured with the system as the model that is linked for server, PC, tablet PC and smart phone through wired Internet and wireless Internet (WiFi). It was designed to be used the programs of electronic lecture desk, beam projector and servers and the applications of smart phone by using BYOD.

By using the application realized, the learners are learned of the level of understanding on class after obtaining the real-time evaluation on the class contents. In addition, the teacher may have the learning for each level through the real-time interaction and narrow the gap by intense feed backing on the slow learners.

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