

Collaborative Learning Application Based On Android Platform

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Abstract

The present Smartphone provides features such as fast connectivity, interactive user interface fast processing speed and better response time giving rise to new possibilities for m-learning applications. The proposed system includes Mobile system based on Android platform for students, web based application developed in HyperText PreProcessor for administrators and faculty members and MySQL for the database. The system provides the students with course materials, notifications, personal queries and test sessions. The faculty members will be provided with the facility to upload and update the course materials, send timely notifications, answer the queries, and an infrastructure to create, store and evaluate conducted test sessions.

1. Introduction

All E-Learning can be combined with mobile computing creating the M-Learning or Mobile learning paradigm, improving the cooperation between students and teachers. Mobile phone technology grows very rapidly in term of processing speed, display and multimedia capability. Mobile

phone is not merely for voice communication but it started to be used for data communication device [1].

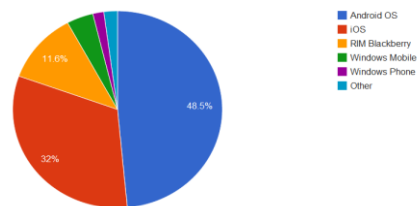


Fig.1.0 Smartphone statistics [2]

Relatively youngsters now a days, (more than two out of three people) aged between 18 to 25 have smartphones. This group leads smartphone adoption with 61 percent using a smartphone as their primary mobile handset.

Presently, to access pdf's, syllabus and such similar study materials, the students have to search from various different sources that provides these materials. Also whenever there are some cancellations of lectures, the students are not notified on time. Also during lectures, the students do not get opportunities to ask subject related queries. This situation also arises during the exam time as well.

In our proposed system, all the above issues will be overcome in one application itself. Also the goal is to provide an infrastructure for creating, storing, applying and correcting academic tests. Students can also download and execute their tests by means of cell phones. The students will be provided with an option to ask their queries to the respective faculty members.

The proposed system aims to offer means for:

- Collaborative learning.
- Organizing resources and activities.
- Auto evaluation.
- Sharing educational resources from any location [3].
- Test sessions.

2. Related Studies

2.1 Mobile Learning and Collaborative Learning

A survey on worldwide mobile industry found that mobile phone sales to end users totaled 417 million units in the third quarter of 2010, a 35% increase from the third quarter of 2009. Smartphone (e.g., iPhone, BlackBerry and Android-based phone) sales grew 96% from the third quarter of 2009, and smart phones accounted for 19.3% of overall mobile phone sales in the third quarter of 2010 [4]. With the advancement of handheld devices' computing capability and mobility, the computing devices have become ubiquitous in today's consumer electronics. People can acquire information with laptop or handheld devices and wireless services anytime and anywhere. More and more studies focus on these devices, especially in the field of electronic learning. Learning with mobile devices unlocks the study issues of mobile learning. Mobile learning can be used to complement classroom and online learning. It also makes learning seamless and personal. One study have claimed that a great majority of college students own computers and wireless devices with almost 80% believing that internet use has enhanced their learning experience [5]. Besides, collaboration becomes an essential competency in current society. It is hardly possible for an individual to complete a complicated task without help from others. As this

consequence, the collaborative learning model becomes another study issue that people would pay attention. Robert E. Slavin in Johns Hopkins University addressed the concept of collaborative learning in 1983 [6]. According to Julita Vassileva's study in 2008 [7] claimed that the social/collaborative learning environment needs to have three main purposes: 1) It would help learners to find the "right puzzle piece" of knowledge. 2) Further, it would also help learners to find the "right" people to collaborate or play with, to teach or to help learners find the missing "right puzzle piece". 3) The most important, it could motivate/incentivize learners to learn [7]. In our study, not only the mobile learning environment we want to achieve, but also the collaborative learning environment we want to fulfill. The three purposes mentioned above could also be part of our goals in our proposed system [8].

2.2 Testing Management System

The Internet has been considered as an educational tool accessible via many computers around the world. Several types of educational content can be delivered in different formats. However, the development of high speed networks, wireless communication and mobile devices, definitively, changed this scenario with the m-learning systems. New forms of cooperation and delivery content are essential, in this context. Some works that addresses cooperation and educational content are Lahner [9], Divitini [10] and Peiper [11].

A complete m-learning system is not composed only by delivery content. A test management system is also required. A wireless student testing system for WAP devices has been designed and implemented at Columbus State University in Zanev's Work [12]. The main problem of this approach is that students must be connected while the test is answered. The same author developed a test management system for multiple choice question in [13]. Balasundaran's work [14] focuses on using SMS for answering short words-answers types of questions and evaluating them using simple matching process, providing enough feedback. Benavent [15] developed a XML-based test system running on Windows Mobile-based

smartphones which allows students to take different stored test. This mobile-based application runs off-line and only connects through Internet whenever should be required [16].

3. System Design

We propose a client-server system, which considers the set of objectives as defined. The client application is created for Android devices and has in mind all the key participants in an academic environment and the server side application will manage the databases.

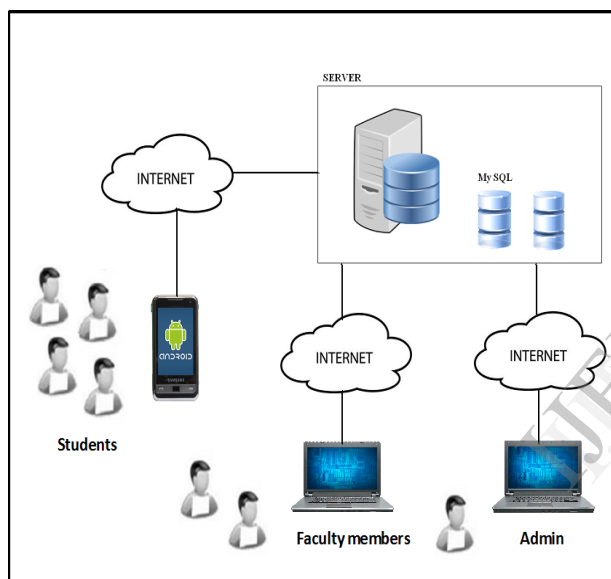


Fig. 2.0 System Design

Basically, there are three types of actors in our integrated system:

- **Students: -**
Acquire study related information and perform the test.
- **Faculty Members:-**
Update all the study materials, conduct tests and evaluate them and update lecture timings. They can also make two-way communication on web-based system with students' mobile system.
- **System Administrator:-**

Administrator keeps all operation in whole system smooth and correct. He can protect, delete and restore materials and information. He can hide and delete data, and block abnormal users, as well.

3.1 Android-based Mobile Environment

The android-based mobile system is built on version 2.3 (Gingerbread) and above. The Android operating system is built on a software stack environment, which consists of Java applications running on a Java-based, object-oriented application framework on top of Java core libraries running on a virtual machine. It provides various application libraries, the surface manager, media framework, relational DBMS, OpenGL for embedded systems, 3D graphics API, layout engine, graphics engine, and security mechanisms like SSL are included [8]. The proposed system is designed assist the students to acquire all the academic information.

3.2 Web-based Environment

The web based system is constructed for administrators and instructors to provide information to each learner. The whole system is designed in PHP language. JQuery, JavaScript platform is elected to facilitate rich client interface and asynchronous connection between browser and http server (AJAX). WAMP (Windows, Apache http server, MySQL and PHP) framework is picked to be our web and database server [8]. In our proposed system administrators and faculty members can monitor the operating situation of system and provide assistances to students.

4 .WORKING

The system is divided into three subsystems for:

- Students.
- Faculty members.
- System Administrator.

4.1 For Students.

For a class of a particular branch for each year, a login ID and a password will be assigned thus allowing all students to access the Android-based application. After logging into the application, the students will be provided with the various options of study materials. These includes time tables, subject PPT's, PDF's, e-books, exam question papers, assignments, etc. To access these, the students require internet connection to download the materials from the backend server. The test sessions that have been included consists of two types: practice test and class test. The practice tests have been designed for self-evaluation by the students themselves whereas the class tests will be held during the class hours under the supervision of the teacher. The students can ask their related subject queries from their mobile application to the web-based application meant for the teachers.

4.2 For Faculty Members

For a class of a particular branch for each year, there will be a same login ID but a different password assigned thus allowing the faculty members to access the Web-based application. The faculty members performs various related operations which includes updating the changes in the timetable, sending notifications in case of urgent delay, putting up important documents, notes, assignments, etc. Also the teacher can view the test results for the test conducted during the class hour. The queries sent by the students can be viewed on this application and the respective teachers can thus answer appropriately to their queries.

4.3 For System Administrator

Administrator keeps all the operations in whole system smooth and correct. He can protect, delete and restore materials and information. He can hide and delete data, and block abnormal users, as well.

5. CONCLUSION

We have outlined a set of objectives and architectural specifications that would describe a collaborative mobile learning system. After a survey conducted by us on students who face many problems regarding the easy access of various kinds of study materials, we have come up with an application that will help the students to acquire all the academic resources at the tip of the finger.

The development of this kind of system makes a step forward in the final arrival of ubiquitous and mobile learning technologies in society.

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