

Mobile Communication System for Health Education

Toshiyuki MAEDA^{*}, Tadayuki OKAMOTO^{**},
Yae FUKUSHIGE^{***}, and Takayuki ASADA^{***}
^{*}Faculty of Management Information, Hannan University, Japan
^{**}Faculty of Law and Letters, Ehime University, Japan
^{***}Graduate School of Economics, Osaka University, Japan

Abstract

We focus on health education as preventing health disorder of student youth and improving “health literacy”, and present an improved system for health education. This system consists of registration management subsystem, short examination (quiz) management subsystem, questionnaire subsystem, and message delivery subsystem.

Key words: Mobile communication, Health Education, E-mail-based education, Interactivity

1 Introduction

For human being, having meal is essential not only to sustain life but also to live healthy and happy life. Japanese life style, including eating habits, are being changed in these decades and there are some dietary problems, caused from over-nourishment and lack of exercise. At national universities in Japan, 11.7% of male students' BMI (Body Mass Index) are over 25, which is increased about 2 % from the statistics in 2000. Overweight may not only causes into health disorder, but also affects future life style, and so it is very important to care for weight. We focus on health education as preventing health disorder of student youth and improving “health literacy”.

We have so far studied lecture-support education systems (for instance [MTA04, MOFA08]), and here present an improved system for health education. This system consists of registration management subsystem, short examination (quiz) management subsystem, questionnaire subsystem, and message delivery subsystem. We furthermore install a session management function for as to manage lecture sequence. Both students and faculties use whole system functions by e-mails, or mobile phone messages, including the server configuration. Mobile phone messages can be used regardless of carriers if those can be sent and received through Internet, and this is very important for us Japanese, as some terminals are incompatible with others if the engaged career differs. In the following, the outline of this system is described, and the functions and effects are discussed.

2 Related Works

There are many useful various education systems supported by computers. A virtual collaboration space; EVE (Educational Virtual Environment) has been developed including synchronous and asynchronous e-learning services[BGT03]. A laboratory has been built around a web-based digital model railroad platform controlled by a client-server system for education of computer science[SAI03]. Also, a web-based system has been developed for control engineering education[SA02]. To put communication skills into engineering curriculum, a web-based system to integrate workplace has been developed. The purpose of the web-based systems is to establish efficient education, and to communicate sufficiently among faculties and students. In various education areas, various education problems are solved using web-based systems[HGMA04]. The most critical problem is, however, that web-based systems cannot use lecture rooms where computers are not settled for all students, and is essential for many cases. We have thus developed an e-mail-based system using mobile phones, which

almost all students have in Japan. There are only few e-mail-based systems for similar purpose, such as [JvRS96].

3 Objectives

Our main objectives are below two:

- preventing health disorder, and
- improving health literacy of students.

Hence we have several concrete targets for students;

- understanding their own situation objectively,
- learning preferable behaviors for preventing overweight,
- enabling to set their tangible goals,
- putting the knowledge to practical use,
- continue to behave for preventing overweight,
- reducing BMI,
- understanding necessity of self-management.

Note that for the time being we have not finished a field test and some of the followings are planed but not executed.

3.1 Understanding their own situation

At first students have to understand general knowledge of overweight, such as “what is overweight”, “why overweight is not preferable”, and so on. For that purpose we proceed pre-questionnaire and later have a lecture. After that we pose on some short examinations for acknowledge the understanding levels.

3.2 Learning behaviors

In order to learn preferable behaviors for preventing overweight, students have to clarify their own problems for everyday life. For that reason we order students to save their dietary record.

3.3 Tangible goals

After above, students have to be able to set their tangible goals. At this period we offer another lecture and make examinations, and then we advise respectively.

3.4 Continual practical use

Putting the knowledge to practical use and continuing to behave for preventing overweight are very important for this activity. We mainly use e-mail system for this, and if needed, support personally.

3.5 Self Management

Even after the end of this series, reducing and keeping BMI, and understanding necessity of self-management is essential. We have questionnaires for evaluation, and we use e-mail based system for usual life time as well as above support.

4 E-mail-Based System Architecture

4.1 System Concept

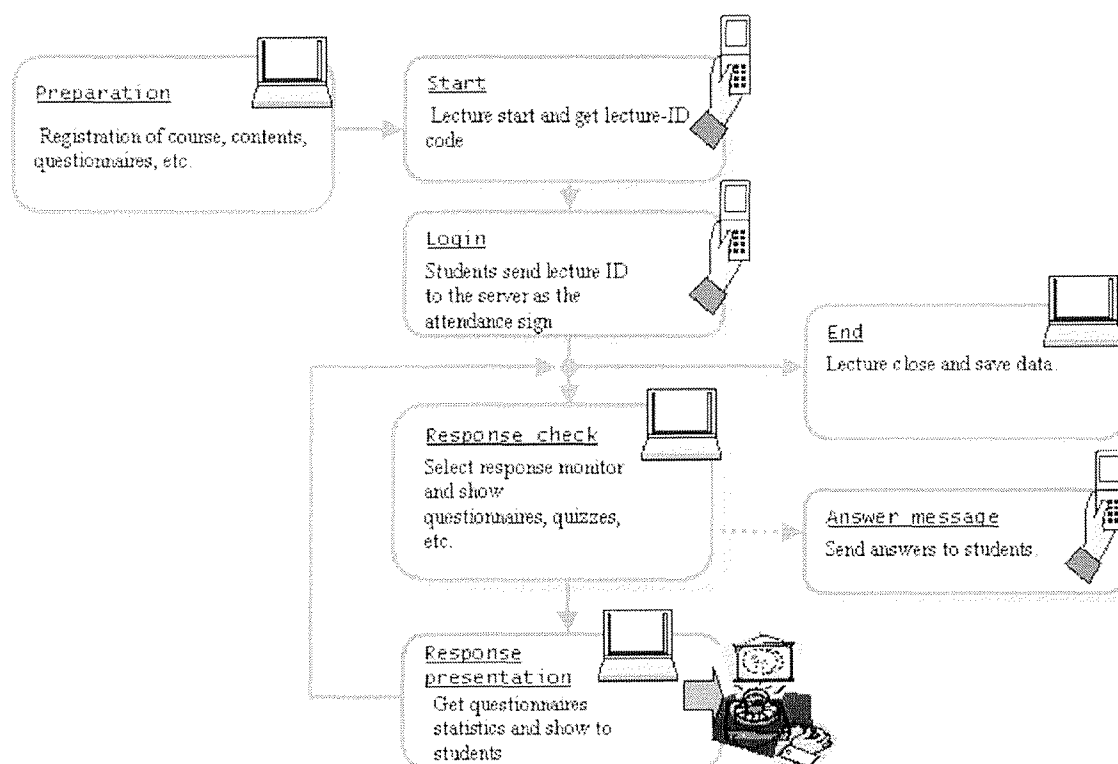


Figure 1: System flow.

Figure 1 shows the basic flow of our system. Control of short examinations (setting questions), synchronized attendance data, etc. are integrated as switching function using only e-mail messages from mobile phones. Because almost all of university students have mobile phones, extra cost (payment) of each student is not necessary at all. As for communication of this system, it requires at most several tens characters, and so the cost doesn't take so much. The annual cost is a few hundred yen, and the packet transmission of the fixed charge plan will emerged and then the cost will be negligible in the near future. As almost all of university students have mobile phones recently, each student's extra cost (payment) is not necessary at all. As the communication for this system, it requires at most several tens characters, and so the cost is not so much high. The annual cost is a few hundreds of yen, and in the future the packet transmission of the fixed charge system will realised and then the cost will be negligible. Because e-mail can exchange information interactively, it processes by the server by the students' attendance, and using the mobile phone mail function for short examinations and the questionnaire respectively, and the system immediately replies the result to each student. A faculty also sends the instruction to the server by using the mail function of mobile phones, and receives the result of the total result with each system by the mobile phone. The personal computer is

not required and so this system is applicable for all classrooms. It is only required a mobile phone as a terminal that can send and receive the e-mail, though you may use the personal computer.

4.2 Registration Management Subsystem

Because sending mails by students themselves automatically does attendance check, faculties can understand the situation in real time. It is recorded in the attendance database that the faculty receives, not only attendance and absence but also students' registration, and because it can be received as the registration order list of names, it can be used for the nomination etc. in the class. Moreover, latecomer(s) can be easily recognized by a reverse-order list (order with late registration) of student names. Attendance can be confirmed in the registration result because it individually replies to an individual student.

Moreover, if the mistake is found in sending mails, the student gets replies of error mail, and the registration mistake is not generated because the attendance registration can be done again. Using it together with short examination and questionnaire subsystem can prevent injustice.

4.3 Short Examination Subsystem

Faculties make short examinations by using Short examination subsystem, as delivering as e-mails or printing the necessary number of copies. As for printed matters, when short examinations are executed, printed matters are turned upside down and distributed. The answer begins simultaneously for all students. Students fill in the student ID number, the short examination ID number, and the answer in the text of e-mail by one line and send the answer result to the server. The server automatically makes the grade and replies the result.

Students can challenge questions repeatedly until full marks. They can put the order of examinations in the short examinations management subsystem, working on examinations for the student in a game-like sense, and as a result the improvement of the understanding level can be expected. It is possible to study short examinations at home after the lecture time even when missing it, and then continuousness of study can be maintained.

5 Learning Sequence

As management of lecture sequence is important for continuous and habitual learning, we introduce a sequence management function using e-mail communication. In this function, session-based communication architecture is used, where e-mail addresses themselves are used as pseudo "cookie" data. That means, confirmation of sequence is treated as sending to and receiving from the same address, which is regarded as user-identification.

5.1 Requirements

Our system manages a leaning session, which is regarded as a sequence (several stages) in one lecture. The requirements of the session management are as follows.

- Our system uses various addresses and messages from students are sorted by the addresses.
- The system uses a e-mail address of each student as "session ID", and through a lecture the address is marked as ID.
- The system stores and maintains communication data within a lecture databases, where e-mail addresses are continuously checked and followed as ID.
- Responses are sent to each addresses, and in this way communication are kept until the end of the lecture.

5.2 Session Management Flow

As figure 2 shows, session management flow in our system is described as follows;

- Distribution by destination e-mail address:
Each destination address is delivered into various functions.
- Start of session by above e-mail using address as authentication ID.
- Reservation of session data:
Continual data (used by several mails) are processed and saved in records corresponding to effective session ID.
- Delivery of results to each user by sending e-mails.

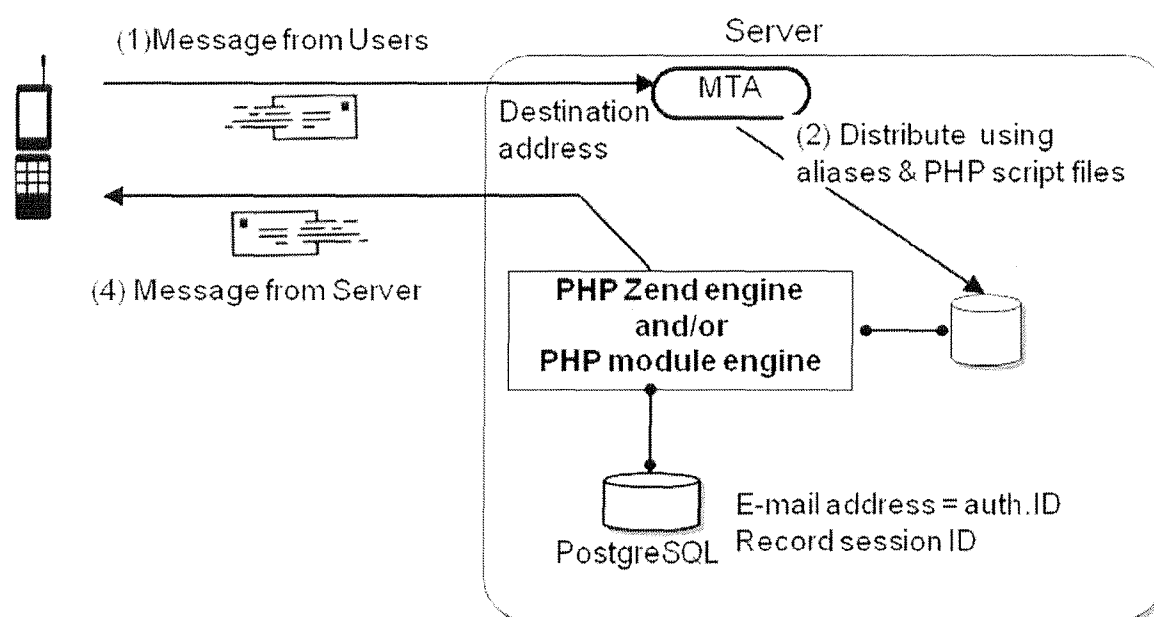


Figure 2: E-mail session management.

6 Concluding Remarks

We present an e-mail-based health education system. We must certify the effectiveness of our system, which consists of several subsystems.

As the future plan, we need more field tests to refine our system, and concurrently improve each subsystem, for instance, short examination functions, and so on.

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