Chapter 18

E-Mail Based Mobile Communication System for Interactive Lecture Support

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ABSTRACT

The authors of this chapter present an e-mail based mobile communication system for interactive lecture support. This system consists of: attendance management subsystem, attendance history management subsystem, short examination management subsystem, questionnaire subsystem, and assignment delivery subsystem. Both students and teachers mainly use only e-mail functions and it can access the server. This system can be used regardless of terminal models only if mails can be sent and received through the Internet. In this chapter, the outline of this system is described, and the functions and effects are discussed.

1 INTRODUCTION

One of the major problems at universities in Japan is reduction of 18 year-old population. The rate of aged people is getting higher and higher, and accordance with the changes of this population composition, 18 year-old population is decreasing as well. The population of 18 year-old was 1,773,000 in 1995 (Summary of First Basic Complete Tabulation Results, (2010)), and it is predicted that the population of 18 year-old will be 1,260,000 at the end of year 2008 (Population of High School Graduates, (2010)). Thus the decreasing rate of the population of 18 year-old will be around 30 percent, and the population...
The decrement of 18 year-old significantly influences education of universities in Japan.

The most significant effect is that average academic abilities of students are falling down (Education Revolution, 2010, Falling Down of Academic Ability, 2010). Therefore teaching staffs should work variably because of various levels of students. Teachers have to arrange contents of lectures corresponding to the various levels. Lectures should be cared for various abilities along with keeping general academic level. Teachers thus should make variant lectures. Especially, keeping up motivation of students is very important in education at universities. Network-based learning (Warschauer & Kern, 2000, Trentin, 2001, Levin & Waugh, 1998) may be a solution to keep the motivation of the students with various abilities. In addition, students should be provided various education opportunities not only in school time but also in any time.

There are other aspects in universities. Lectures in universities have been advanced technically in these years. Blackboards were replaced by overhead projectors and later those were substituted by video projectors and electronic whiteboards. In these days many lecture rooms are settled with computers as well as video and audio systems, allowing the integration of every possible type of media into lectures. Nonetheless the basic paradigm is not changed so much throughout this time: teachers give presentations with several different media to show topics of the lecture. For large classes in the order of more than 100 students, where spontaneous interaction is no longer possible, this leads to unidirectional communication and a lack of interactivity between the students and teachers.

Teachers often try to solve this problem on making questionnaires to hook feedback on how well the students have understood the presented material, as well as provoke them to actively participate (Bligh, 2000). For large number of students this is a very big problem as only a small fraction of students can interact with the teacher in this way. The majority will not follow this form of interactivity and remain inactive.

Spontaneous questions asked by students and replies by teachers at lectures make good relationship with each other, leading higher understanding level of students. At lectures in a large classroom this is often difficult. First, not all students can ask questions because of time constraints. Second, many students do not dare to ask questions in front of a large audience. Finally, if questions are taken only at certain times, the questions are out of context of being naturally asked. All three problems does not cause students to interact at all.

Another problem arises when the teacher wants to get feedback on how the lecture is accepted by the students and what he or she can do to improve the lecture. In lectures with a small audience the teacher can typically deduce this information from social cues, e.g., the students look bored or are inattentive. For large audiences this information is usually gathered by passing out feedback questionnaires to the students at the end of a lecture period. Unfortunately this approach is rather coarse-grained and does not allow the assessment of individual elements contained in a lecture. Furthermore it is not possible for the teacher to quickly react to problems.

These issues have gained even more importance over the last few years by the rapid spreading of synchronous distance education. In an environment where a lecturer has to pay attention not only to a local audience but also to remote students, all of the problems mentioned above increase dramatically.

We have therefore researched several systems (for instance (Maeda, Tomo, & Asada, 2004, Maeda, Okamoto, Fukushige, & Asada, 2006, Maeda, Okamoto, Miura, Fukushige, & Asada, 2007, Maeda, Okamoto, Fukushige, & Asada, 2008, 2009b, 2009a)), and here present an e-mail based learning support system. This system consists of attendance management subsystem, attendance history management subsystem, short examination management subsystem, the