Constructing an Interaction Support System with the Capability of Social Networking Service for a Practical Lecture and Examining its Efficient Operational Policy

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ABSTRACT

Recently, various types of Social Networking Service (SNS) have been actively utilized in many educational situations, and the effectiveness has been continuously reported. The aim of this paper is to develop a web based discussion support system, to introduce the proposed system to a real university lecture, and to examine the operational policy for improving the learning effect from the viewpoint of quantitative perspective. The system of this paper offers interactivity between lecturers and students to dialogue opportunities in a PBL practical lecture. To support interactions in learning, a web application of SNS with groupware function and micro-blog based communication function similar to Twitter is developed with LAMP and Ajax, and it works as an information transmission platform for enhancing interactions and collaborative activities. All students can post their comments and questions by the form of short messages through a web browser on their own cell/smart phone or PC device under unique online name. The constructed SNS is only available within local area network, and only messages related to the contents of the lecture are accepted by the prepared operational policy. The constructed SNS continues to work not only during lecture but also after class. The process and the history of interactions continue to be stored on the virtual space, so a lecturer can get to know the condition of students such as the depth of understanding and the difficulty level of the contents, and besides, students can easily cooperate with each other. This paper prepared 3 different operational policies for each learning group, and clarified the difference between these operational policies from the viewpoint of complex network theory. Also by comparing each operational policy on the basis of subjective evaluation result and the quality of learning outcome, an efficient operational policy to promote SNS blended learning was clarified. Additionally, the characteristics of SNS utilization according to student’s learning outcome were shown with principal component analysis.

KEYWORDS

Ajax, Interaction Support System, LAMP, Practical Lecture, Social Networking Service
1. INTRODUCTION

Today many information systems with SNS (Social Networking Service) capability have been aggressively utilized at various situations for aiming to share information and for activating communication. In the case of business situations, there are many practical examples of introducing SNS(s) for supporting the interactions between company members and for enhancing the exchange of opinions beyond the wall of departments. Additionally various application examples of SNS(s), including information systems with some kind of SNS feature, and also the effectiveness of SNS(s) has been reported (SonicGarden, 2013). For example, SNS(s) have been utilized as a groupware application mainly providing schedule management and data sharing to assist each one’s daily business activity, and as well as introduced to share implicit knowledge from daily common conversations as a knowledge management tool. Not only business situations, SNS(s) have also been actively introduced into various educational fields, and especially many operational results mainly at higher education institutions including universities have been reported. In many cases, the main purpose introducing SNS at educational fields is to facilitate the communications between students and also academic staffs. As concrete examples, we can show the efforts: relation construction between students and local residents (Abe 2013), elimination of scheduled new students’ worries about new school environment (Sakuma 2008), relation construction between all university members including academic and office staffs (Nishide 2012), and assistance of lectures and after-class hour learning (Saito 2011).

The authors have previously developed an interaction support system between participants in lecture for promoting knowledge distribution and improving reusability of knowledge (Matsumoto 2011, 2012). Our previous system covered university lectures as an application example of dialogue situation (see Figure 1). The authors have been interested in a remarkable social Web characteristic like Twitter and Facebook, interactivity and real-time property, to support a practical engineering lecture, and proposed a discussion support environment which positioned a website of micro-blog based message board as an information transmission platform. Our previous system was designed to be intended for traditional-type lectures in university. All audiences, who are students in the case of our previous works, can post their questions and comments during lecture at any time when they need. All participants can always see the present condition of discussion and also its process on the Web through their browser on lecture’s public projector screen, their own PCs or smart phones. As for the front-end technology, our previous system was implemented with LAMP. To perform real-time property, Ajax based UI, automatically updatable JavaScript based client side Web interface technology, was developed, then it could work simultaneously with real discussion. Most of all, our previous system could entertain many students since the virtual interactions could boost students’ concentration, and from the operational results, we understood that it had a potential for stimulating discussions. The operational results also showed that students’ messages could help lecturer to know their understandings and to plan the progress of lecture because the lecturer could check obtained questions and comments quickly. Similarly, students could offer each other advice and assistance to understand the story of lecture, so the lecture with our previous system would be more fruitful than only the usual traditional-type lecture without some ICT tool.

The aim of this paper is to construct a micro-blog based discussion support system with SNS capability as shown in Figure 2, to introduce the system to a real university lecture, and to examine the operational policy for improving the learning effect from a quantitative perspective. The research flow of this paper is shown in Figure 3. Firstly SNS blended learning environment is constructed to support interactions in team activities, and improves learning efficiency of a PBL practical information systems engineering lecture.

This paper newly examines the operational policy of SNS because the performance of SNS is considered to be important for the improvement. Usually the effectiveness of SNS has been shown from only the aspect of subjective evaluation for students, but the effect of SNS is thought to fully depend on a certain rule to utilize SNS. Therefore this paper gives different operational policies for
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