HOW DO TECHNOLOGIES CONTRIBUTE TO THE ENHANCEMENT OF SOCIAL PRESENCE? : EFFECTS OF VISUALIZATION OF SOCIAL PRESENCE ON LEARNING

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ABSTRACT

This study aims to develop and evaluate the CMC tool based on social presence. This system consists of three parts; social presence mapping, chat display, concept mapping, which enhance social presence and encourage learning behavior such as active discussion. The effect of this system was evaluated from the viewpoints of social presence and contribution to learning. The results showed that effect of each function on learning was perceived positive. However, the result also revealed that the function of the enhancement awareness to social presence would be needed.

KEYWORDS

Social presence, Visualization, Collaborative learning.

1. INTRODUCTION

1.1. Research background

Interest has grown in collaborative learning in higher education for fostering high-end learning skills. Collaborative learning requires learners to participate actively in learning. However, there are several problems, in order to conduct collaborative learning in educational settings. Nishimori et al (2005) pointed out the difficulty in adjusting schedules for collaborative learning due to the difference of class among learners, which is afraid to lead to the lack of group cohesion, which delay the task achievement progress.

As information technology advances, using computer networks for Computer-Supported Collaborative Learning (CSCL) get more popular in educational settings, in order to solve the problem above. Especially, Computer-Mediated Communication (CMC) tools such as Bulletin Board System (BBS) is often used as collaborative learning tool for the support of learning in home and out-of-class.

Background theory of CSCL is socio-constructivism, which knowledge should be constructed and re-constructed through interaction between learners or learners and artifacts. In this view, it should be considered how to enhance learners' interaction in collaborative learning process in virtual group, when design CSCL. This study aimed to develop and evaluate CMC tool for collaborative learning based on social presence, which contributes to enhance learning motivation and achievement. This paper introduced and reported social presence and CMC tool named "SPchat".

1.2. Social Presence

One of the frameworks of evaluation in learning with CMC is social presence. Social presence is a concept related to one's perceptions of oneself and others, and to social interactions in a community which could promote a trust relationship and play an important role in promoting CSCL. Learners' perception of presence is affected by social presence, which Short, Williams, and Christie (1976) described as the "degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationship,"

that is, the perceived proximity to real time communication in face-to-face settings, depending on the CMC types. Short, Williams, and Christie (1976) suggested that the two factors which promote social presence are "immediacy," which is the psychological proximity of the interlocutors such as facial expression and "intimacy," which is the perceived familiarity caused by social behavior such as eye contact and smiling.

However, many researchers interpreted social presence in various ways in their experiments and applied practices. Gunawardena and Zittle (1997) conducted a research project investigating the effect of social presence on learning satisfaction, from the perspective of facilitating the modulation of discussion and the perception of interactivity in online discussion. Their research revealed that a high perception of social presence has positive effect on learning satisfaction. This view focuses on the interactivity between learners in CMC. When groups use the same CMC in their online learning, social presence depends on interactivity.

In other view, social presence has expressive feature. This view regards social presence as a kind of communication ability. Garrison et al. (2000) redefined social presence as indicated in Table1, suggesting that social presence has expressive functions for the establishment of group cohesion in asynchronous text-based communication. Garrison and Anderson (2003) explained social presence as one of the elements in "Community of Inquiry (COI)," in which teachers and learners interact in text-based online communication. Social presence is regarded as a necessary element for creating a trusting environment for interpersonal communication, in order to develop an atmosphere hospitable to discussion. Garrison and Anderson (2003) proposed the indicators of social presence in asynchronous text-based CMC as displayed in Table 1

Table 1. Indicators of Social Presence (Garrison and Anderson, 2003)

Category	Indicator	Definition
Affective	Expression of emotions	Conventional expressions of emotion or unconventional expressions of emotion, emoticons etc.
	Use of humor	Teasing, cajoling, irony, understatement, sarcasm.
	Self-disclosure	Presents details of life outside of class, or expresses vulnerability.
Interactive	Continuing a thread	Using the reply feature of software, rather than starting a new thread.
	Quoting from others' messages	Using software features to quote others entire message or cutting and pasting selections of others' messages.
	Referring explicitly to others' messages	Direct references to contents of others' posts.
	Asking questions	Students ask questions of other students or the moderator.
	Complimenting, expressing appreciation	Complimenting others or contents of others' messages.
	Expressing agreement	Expressing agreement with others or content of others' messages.
Cohesive	Vocatives	Addressing or referring to participants by name.
	Addresses or refers to the group using inclusive pronouns	Addresses the group as "we," "us," "our" etc.
	Phatics, salutations	Communication that serves a purely social function: greetings, closures.

In order to enhance interaction between learners, the viewpoints above are very useful in designing CMC tool for learning. Integrated view of social presence seems to be appropriate to design and evaluate CMC tool in learning. Therefore, it should be considered the system design which the enhancement of social presence leads to learning behavior. This study also aimed to illustrate the direction of design the function which promotes learning with the enhancement of social presence.

2. SYSTEM

2.1. System concept

The system developed in this study consists of three parts; social presence map, text chat and concept map. One issue in this study is how to make learners aware of and express social presence. In order learners to be aware of and express social presence, visualization can be one of effective function. After learners log in this system, social presence map is displayed. It allows learners to perceive the activity of group and interaction between learners. This map is described based on content of posting in text chat, referring to the indicators of social presence shown in table 1. This map is designed, referring to the social presence feature of both perceived and expression.

As communication medium, text chat seems to be useful for learners, due to the use in both synchronous and asynchronous communication tool. This text chat allows learner to use emoticons for the support to use social cues in text based communication. Concept map, which enables learners to organize ideas and opinions, is integrated with text chat. Concept map can be effective on the design in order to make a bridge between the enhancement of social presence and learning behavior (Yamada, 2010). The function of organizing ideas and concept promotes communication, as a result, leads to high performance in CSCL (Funaoi et al, 2003). This system developed in this study will allow learners to be aware of other learners' presence and be engaged in task efficiently.

2.2. System architecture and functions

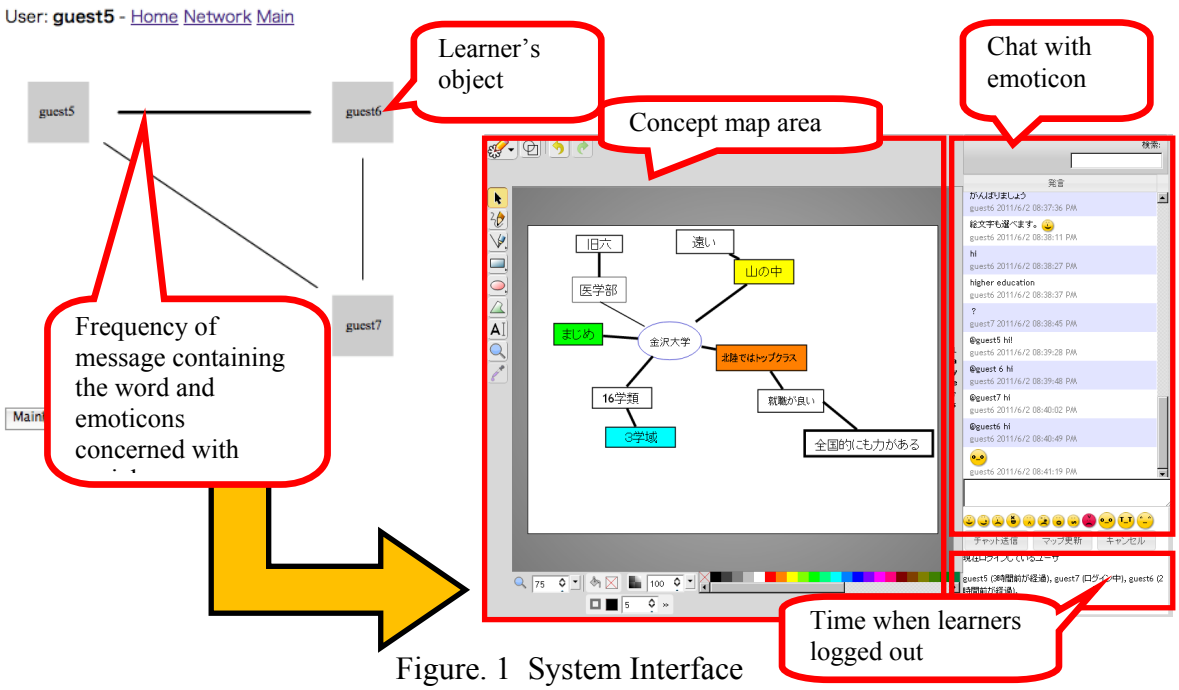

Figure. 1 System Interface

This system is a client/server system. Clients consist of software allowing social presence display, chatting, and concept mapping. The server side consists of social presence calculation, chatting management and concept map synchronization. Client software for all system types was developed in Javascript and Action Script 2.0 (social presence display). Concept map and chat functions were developed in Javascript based on jQuery with three javascript libraries; "svg-edit" for concept map, "DataTables" for chat, and "emoticonize" for emoticon use in chat. The server software are implemented in PHP 5.0 and MySQL on the Apache 2.2 web server with the PHP module. All of the server software runs on the same computer. This system allows learners to be aware of social presence before the engagement, and organize their idea and opinions with chatting and concept map. After login, this system moves to social presence display, which shows the frequency of communication contained words and emotions concerned with social presence. Social presence calculation in server program checks address (or group) and the frequency of word and emoticon in each

message. Social presence calculation sends the frequency data and address to social presence display. After learners check social presence display, this system moves to chat and concept map areas. Learners can make concept map with group members. The figures which learners can select are circle, rectangle. Learners can write concept name or explanation on figures. Learners can link between concepts by line or arrowline, in order to describe the relationship or causal association. Clicking on concept map stage enables learners to make and edit concept map. Other learners cannot do it while one learner does. When push "Sharing map" button, this system synchronizes concept map in group, and unlocks to make and edit concept map. Figure 1 displays system interfaces. This system also displays time when learners logged out. This function seems to be aware of other learners' social presence.

3. FUTURE WORKS

The purpose of this study was to develop and evaluate the effect of this system for raising social presence and learning behavior. This paper reported the CMC tool for collaborative learning based on social presence theory. Future works are recommended as follows:

(1): Evaluation of proto type
Formative evaluation should be conducted whether each function contributes to promote perception and expression of social presence, pointed out above. Emoticon, reply, and nickname display seem to be effective on the enhancement of social presence, according to Garrison and Anderson (2003). In addition, visualization of social presence and learner's logged-out time seem to be affected on learner's perception of social presence.

(2): Development of additional functions
Not only the enhancement of social presence but also the support function of the learning engagement should be developed. Annotation on object on concept map can promote the discussion. Now, this function is under development.

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