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The potential of synchronous communication to enhance participation in online discussions: A case study of two e-learning courses☆

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ABSTRACT

Computer-mediated communication (CMC) has been adopted in most e-learning settings. However, few research studies have considered the effect of different CMC. This study examined how and why synchronous communication affected participation in online discussions. Two online classes that participated in two asynchronous and two synchronous online discussions were examined. Actual and perceived measures of participation indicated that synchronous communication induced *personal participation*, which could be regarded as a complement to *cognitive participation*. Personal participation involves more intense interaction better supported by synchronous communication while cognitive participation is a more reflective type of participation supported by asynchronous communication. In synchronous discussions, the e-learners felt that they worked together and were not restricted to only discuss course content. This was likely to induce arousal and motivation and increased convergence on meaning, especially in small groups.

1. Introduction

E-learning and life-long learning are considered to be important factors in the emerging knowledge society. Scholars have tried to identify the factors that underlie successful implementation of e-learning [e.g., 4,19]. It seems now that it is time to analyze the effect of using different e-learning technologies.

Before the widespread use of computer-mediated communication (CMC), Keegan [16] argued that a key element of distance education was that learners should be taught as individuals rather than in groups, but CMC has changed this; some argue that CMC has transformed the learning environment from teacher- to learner-centered; learning with others have been enabled [9]. It has been empirically shown that the success of e-learning courses depend on providing collaborative learning activities [8]. CMC may be asynchronous or synchronous, depending on whether the communication occurs in real-time or not. The dominance of work on asynchronous communication can, at least, partly be explained by their "anytime, anywhere" feature. It is generally considered "deeper" than synchronous discussions. A question arises, however: how can synchronous communication be integrated into asynchronous e-learning? This study examined how and why synchronous communication as a complement to asynchronous communication affected participation in online discussion. In it, the variable of choice was participation, which was assumed to affect learning outcomes and was expected positively to influence retention rates, satisfaction and a sense of community.

2. Theoretical background

2.1. Theories on media choice and use

Media richness theory (MRT) argues that face-to-face communication is a rich medium while numeric documents are an example of a lean medium. The theory argues that the use of rich media reduces uncertainty, but many studies have found mixed or conflicting results. For example, e-mail can be used for complex communication and in rich ways, depending on the social context.

Two complementary theories help explain empirical results: Kock's [17] media naturalness hypothesis (MNH) and Robert and Dennis' [25] cognitive model of media choice (MMC). The theories were developed by reviewing and analyzing many years of research on media use. They address the limitations of the MRT by taking account of social behavior and cognitive-based views of media use.

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The MNH was based on the idea that communication evolved from face-to-face interaction [18]. It deals with *naturalness* of a communication medium (similarity to face-to-face activity) and assumed that natural communication involved: co-location, synchronicity, and the ability to convey and observe facial expression, body language, and speech. Synchronous communication was assumed to be more natural since it resembled face-to-face interaction. This meant that less natural communication resulted in more cognitive effort and ambiguity, and less psychological arousal.

The MMC argued that individuals needed to be motivated and be able to process messages. Synchronous communication increases user motivation but made it harder for them to process information. However, asynchronous communication allows the receiver more time to comprehend a message because the sender does not expect an immediate answer.

Interestingly, the MNH, and the MMC, support and complement each other. In the first, low synchronicity is assumed to lead to increased cognitive effort while the second argues that low synchronicity increases the ability to process information. Also, MNL argues that high synchronicity will lead to increased psychological arousal while MMC argues that high synchronicity induces increased motivation and decreased ambiguity. Despite criticizing the MRT, the MMC is somewhat deterministic. It is, after all, the users and not the medium that determine whether asynchronous or synchronous operation occurs. However, a medium might better support synchronicity, naturalness, or social presence because of its characteristics.

2.2. Comparative studies of asynchronous and synchronous communication

Examples of comparative studies of asynchronous and synchronous communication are summarized in Table 1. Most of these compared text-based discussion board and chat in higher education settings. They relied on social, collaborative and constructivist learning theories. The main analysis methods were content analysis of electronic logs, surveys, and interviews. Large-scale studies identified few significant differences between asynchronous and synchronous communication, which seem to be subtle and were mainly found when conducting qualitative content analyses in smaller groups. The studies indicated that asynchronous communication was more suitable for reflection and discussion of complex ideas. Moreover, the studies revealed that e-learners enjoyed synchronous discussions because they were more social, though several studies found that participation was more concise and less deep. The studies suggested that asynchronous communication was preferable when the purpose was to discuss complex ideas.

2.3. Researching online participation

Haythornthwaite [12] argued that three types of exchange were important in building and sustaining participation in a learning community (see Table 2). Firstly, sharing information among learners helps them feel comfortable and ask questions. E-learners access many other people's messages and responses to them. Thus it is important to include measures of *perceived* participation. Secondly, task support is essential, especially when e-learners produce a product, such as one in collaboration with peers. Therefore, e-learners need support in accomplishing such exchanges. Thirdly, social support is desirable as a way to foster knowledge work and collaborative learning; it provides an environment where communication is encouraged; e.g., anecdotes and personal experiences encourage trust, which foster receptive and creative learning environments [14].

3. Method

We decided to focus on two case settings. This allowed us to study them thoroughly but to elucidate more general results. An assumption of this work was that participation is a complex phenomenon, needing the use of several data collection methods in order to gain a deeper understanding of the phenomena [3]. Consequently, electronic logs, questionnaires and interviews were used to collect both actual and perceived measures of participation in the case settings.

3.1. Research setting

Two e-learning courses were selected. They included asynchronous and synchronous online discussions with geographically dispersed students who mainly communicated via CMC media. The first case setting involved a series of online discussions with students taking two courses in Knowledge Management.

For the first case, two universities, one in Argentina and the other in Sweden participated in two asynchronous and two synchronous text-based online discussions using discussion board and chat mechanisms over a 2-week period. Although the Argentinean and Swedish students never met face-to-face, introductory sessions were arranged in both Argentina and Sweden.

The second case setting was an online course in Change and Knowledge Management. It was the first course in a Swedish part-time master program and is the equivalent of a 10-week course of full-time study. The students participated in two asynchronous and two synchronous text-based online discussions, again using discussion board and chat, over a 4-week period. Demographic data for the participants of the two case settings are presented in Table 3. The participants were professionals of a rather high mean age, which suggested that the results may, at least partly, be generalized to e-learning and online collaboration in organizations.

The case groups were scheduled to conduct asynchronous and synchronous discussions every week or every second week. Most students did not meet face-to-face, except for two participants. The e-learners participated in the discussions wherever they found convenient, usually at home or work.

In all sessions, the teacher suggested discussion questions for the group and asked participants to submit questions on the course literature. The synchronous discussions were scheduled for 3 h and participants worked in small groups; the asynchronous discussions were scheduled to occur over a week.

The internal validity of the study may be questioned, as the participants were divided into small groups in the synchronous discussions but not in the asynchronous ones. However, we had decided to work with larger groups in the asynchronous discussions because it has been shown to create better interaction; in the other hand, chat discussions are normally conducted in smaller groups since contributors find it difficult to maintain a logical sequence of participant's contributions and thus keep message load manageable [13].

3.2. Data collection

Interpersonal relations can be studied by seeking to measure existing relations or relations *perceived* by the actors. Picciano [24] found that e-learners who posted few messages thought they had made more than they actually did and that those who posted many messages thought they had made less. Since actual and perceived participation may differ we decided to triangulate measures of actual and perceived participation, in order to gain a better understanding of it.