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Abstract

An exploratory study of class email and discussion database postings in two advanced IS undergraduate classes looks at the extent to which the students use these collaborative tools for organizational memory purposes. The instructor was trying to move communication away from email onto an Internet-based Lotus Notes discussion database (Domino) in order to provide a shared organizational memory that would benefit a greater number of students. Students working on group projects used both email and Domino for both teamwork and topical contributions to organizational memory at much higher levels then students working on individual projects.

Introduction

IS faculty use collaborative information technologies (IT) to encourage classroom learning. IT provides students, who work and live in wider urban areas, access to course material and to the ability to work on assignments, ask questions, share knowledge, and submit work, even when they are not on campus. Delivery costs are lower and an electronic organizational memory is available to everyone. Yet, for those of us who embrace these collaborative tools, there is an on-going problem of motivating students to share information with each other to build and use the organizational memory, even when it might be advantageous for them. Our students often seem motivated to use these tools only out of self-interest--when they have a question they want the instructor to answer, or when they receive extrinsic rewards such as points toward grades. This paper discusses an exploratory investigation that compares the use of two Internet-based collaborative tools, email and Domino discussion databases, in two advanced IS undergraduate classes, Rapid Systems Development (RAD), and Multimedia Applications on the Web (Multimedia).

Both email and Domino are asynchronous collaborative tools that support learning across distances (Alavi, Wheeler and Valacich, 1995; Leidner and Jarvenpaa, 1995). According to Leidner and Jarvenpaa (1995), the collaborative model of learning is superior to individual instruction in many ways (e.g., long-term retention, individual achievement, and the desire to learn). In this study the instructor tried to motivate collaborative learning by discouraging individual email and encouraging contributions to a shared organizational memory on Domino. The advantages of the Domino organizational memory over email are several: access anytime, anywhere; peer-to-peer sharing of information without going through the instructor; and help from experts (experienced student assistants) outside the classroom.

This exploratory study has several short-term purposes. The first purpose is practical--to observe and explain through interpretive methods, the conditions associated with successful class use of IT-supported organizational memory. Understanding these conditions might help improve future attempts at collaborative learning. The second purpose is to generate further ideas that may lead to a more focused investigation of collaborative learning using IT-supported organizational memory.

Background

Research on organizational learning and collaborative telelearning provides a conceptual literature on technology to support of the role of organizational memory in collaborative learning. This paper borrows the definition of organizational memory provided by Stein and Zwass (1995): "the means by which knowledge from the past is brought to bear on present activities, thus resulting in higher or lower levels of organizational effectiveness" (p. 89). Measures of organizational effectiveness (Dhaliwal and Benbasat, 1996) could include effects on behaviors (user acceptance as indicated by levels of use), on learning (improved understanding), both of which may influence judgmental decision making (effectiveness and efficiency). This exploratory study looks at effects on behavior in the categories (Stein and Zwass 1995, p. 93) of "group/team memory" (i.e., "small business team supported across time and projects") and "topical memory" ("accumulates answers on a targeted range of topics"). The students in the study are assumed to have equal access to the technology and adequate computer experience to use the technology with relative ease.

The Data

The sample in this study includes student contributions to organizational memory in the form of email messages and Domino postings from 3 sections of 2 different classes (408 contributions from the instructor were discarded). The classes each had assignments that required email and Domino postings. All students had to

email the instructor during the first week of class to introduce themselves. All students were introduced to Domino as the repository for organizational memory during the first week of class and were encouraged to post questions and answer other students' questions. The instructor gave extrinsic rewards for specific assignments (reports in RAD, written and critical thinking assignments in Multimedia), but did not reward group/team memory or topical memory contributions, because earlier attempts produced inane, meaningless postings for the sake of earning points.

The RAD class included 19 students who, in teams of 4 to 5, worked on a software development project and learned methods of rapid application development and project management. Emphasis was placed on group processes, such as team formation, team roles, managing peers, and task organization. The teams had to integrate their subprojects, which required intra- and inter-team communication and coordination. Teams frequently acquired a team email address from a free provider and sent the instructor copies of their inter-team and even their intra-team communications. Aside from examinations, most of the work in the class was submitted at the team level. A few individual reports were required on Domino, but most represented team effort. The RAD class communication produced 214 messages (142 email messages and 72 Domino postings; Table 1), for an average of 7.5 email and 3.8 Domino messages per participant. Only 20% of these contributions were required assignments. The RAD students produced 41group/team email and 44 group/team Domino postings. They found both media useful in coordinating subprojects. The 74 topical email contributions included 17 student questions and 57 contributions containing answers or information. Their 10 topical Domino postings included 7 questions and 3 answers.

The Multimedia class included 2 merged sections with a combined total of 65 students and 5 "expert" student assistants who volunteered in class and answered questions posted on Domino. Students in this class do individual projects, but often need help because they learn 3 relatively difficult multimedia applications. During the second half of the term, the students also post individual written assignments on Domino, as well as one group assignment (approximately 5-6 students per group). The total number of messages for this class was 979, of which 794 were on Domino and 185 via email (Table 1), an average of 12.4 messages per participant. However 762 (78%) of these contributions were required to fulfill assignments. Of the nonrequired ones, none were group/team memory contributions; 128 were questions (102 via email to the instructor, and 26 via Domino); and 89 were answers or informational postings (36 email, 53 Domino). Fourteen students posted questions on Domino and 13 students and the 5 student assistants answered questions or posted information. Over 60% of these answers/informational postings were from student assistants and one enrolled student. Thus, nonrequired use of Domino was very low in this class.

Table 1. Types of Contributions

	RAD			Multimedia			
Contribution Type	Email	Domino	Total	Email	Domino	Total	Totals
Required Contributions (individual & group)	27	18	45	47	715	762	807
Group/Team Contributions	41	44	85	0	0	0	85
Topical Contributions	74	10	84	138	79	217	301
Totals	142	72	214	185	794	979	1193
Average Contributions per participant	7.5	3.8	11.3	2.6	11.3	12.4	

The Findings

What is there to learn from this exploratory analysis of class contributions concerning the types of use and levels of participation in contributing to organizational memory?

Not surprisingly, the team/group type use was much higher in the class that was structured around a group project. The RAD students understood that their success depended on team and class collaboration. RAD course content emphasized best practices to facilitate communication and coordination of group work. This particular group of students discovered the usefulness of a Domino organizational memory early in their project. Students responsible for team communication and students who coordinated efforts across teams were heavy users of Domino and expected other teams to refer to their messages for the latest project information.

The small size and relative cohesiveness of the RAD class (the result of team bonding) probably influenced its use of collaborative technologies, because students were able to apply social pressure on one another much more effectively than the instructor could. Several members of this class were simultaneously engaged in job interviews and described to the class the emphasis that employers placed on the types of IT-supported collaborative work they were performing in this class.

Despite the instructor's attempts at social influence in favor of Domino, the Multimedia students were producing individual work and preferred individual access to the instructor via email over group collaboration. Even though Multimedia students met in a classroom in which they worked together at collaborative work-stations to learn multimedia technologies, they were not convinced of the value of collaborative learning. Students appeared to lack the trust necessary for collaborative learning. One student indicated that he emailed questions to the instructor because he did not trust student answers to questions on Domino.

Future Work

Many factors can influence the success of IT-supported collaborative learning. Leidner and Jarvenpaa (1995) discuss learning models that are appropriate for different types of collaborative technologies. They suggest several different approaches for researching the problem.

Possible avenues for future research might include technology applications to support sociocultural learning. Since many of the students at our university belong to ethnic minorities or are recent immigrants, they might benefit from the use of information technology to enable students to learn in their own sociocultural environments in which they feel comfortable expressing their ideas. This approach might be better for students earlier in their studies, however, since advanced students will be expected to use collaborative technologies in their IT careers that are not adapted to their sociocultural environments.

Leidner and Jarvenpaa (1995) also indicate that research is needed on the added value of technology to learning models. Such a study would compare the effectiveness of learning in classes that used technology with similar classes that did not use technology. This approach would work if one could match classes with the same course content and similar student characteristics.

Another approach suggested by the same authors is to look at variables that moderate the influence of information technology on learning, such as course content and student characteristics. The interpretive results of this study indicate that such an approach is promising, since course content and student characteristics seemed to influence behavior in the use of collaborative technologies.

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