Knowledge eCommons: Merging Computer Conferencing and Wikis

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Abstract: Asynchronous computer mediated conferencing (CMC) is widely employed as a medium for collaborative discourse in distance education courses. However, one frequently cited problem with CMC is the lack of coherence in many online discussions. To address this problem, we have developed a new technology called "Knowledge eCommons" that uses wiki functionality to provide representational guidance for online discourse. Our poster presentation describes the results of our initial Knowledge eCommons design experiments.

Introduction

Despite the tremendous promise of CMC, the educational benefits of online discourse are uncertain. While students in online courses frequently interact with one another and exchange information, there is little empirical evidence that they are engaged in the sophisticated processes of joint meaning-making and social negotiation (Wallace, 2003). In fact, conventional threaded discussions have been characterized as lacking coherence (Herring, 1999; Thomas, 2002), and are thought to offer relatively weak support for online collaborative knowledge construction (Hewitt, 2001; Suthers et al., 2008). Hewitt (2001) argues that the source of the coherence problem is the intrinsically divergent nature of threaded discourse. Over time, online discussions tend to branch into dozens of sub-discussions. It is not uncommon for participants to be engaged in many parallel conversations, not all of which are necessarily germane to the original purpose of the thread. While branching is often useful for drawing out a broad range of ideas and perspectives, the resulting lack of coherence makes it difficult to ascertain whether or not the group is making progress. Moreover, it is often unclear which direction the discourse is taking, what conclusions the group has reached, or whether particular issues warrant further inquiry.

A promising solution to the coherence problem involves augmenting conventional threaded discourse with a shared meta-level representation of the group's progress. For example, this might involve displaying an online discussion on one part of a computer screen, and a discussion summary on another part of the screen. As the discussion unfolds, the jointly-owned summary is updated. Shared, explicit representations of this sort are advantageous because they encourage participants to clarify their thinking, identify areas of disagreement, and help learner's monitor the group's growing understanding (Brna, Cox, & Good, 2001). Past efforts to provide representational guidance for CMC have used various discussion visualization tools as an adjunct technology (e.g., Reyes & Tchounikine, 2003; Suthers, 2003; Suthers et al., 2008). For example, in one experiment (Suthers et al., 2008), students were asked to continually update a group concept map as they engaged in online discussion with a partner. This produced promising results. In line with expectations, it was discovered that the small groups (dyads) who maintained a shared concept map during their discussion were more likely to converge to similar conclusions, and score higher on post-tests than dyads in the control condition (i.e., discussion-only). However, the authors of the study questioned the practicality of this approach with larger groups, or over longer periods of time.

Wiki Supports for the Synthesis of Ideas

The current study is also concerned with discourse coherence, but it approaches the problem from a new direction. Rather than use concept maps, we explore how wiki-style supports might provide representational guidance. Wikis offer several advantages in this regard. As the success of Wikipedia illustrates, wikis are useful technologies for creating complex, cohesive artifacts authored by many individuals (Wheeler, Yeomans, & Wheeler, 2008). The ability of wikis to support group coherence is grounded in three different design elements: 1) The existence of a single group-owned document that necessitates negotiation among participants; 2) The preservation of all previous versions of the group-owned document, which prevents the loss of data and permits backtracking; and 3) The provision of meta-level communication supports in which participants can identify problems, resolve disagreements and negotiate consensus. Since a wiki page is a single, jointly owned construct, it can serve as an up-to-date summary of the discussion that can guide further discursive activity.

Knowledge eCommons

The current program of research is being carried out using a new open-source learning environment called Knowledge eCommons (KeC), which has been specifically designed to investigate the coherence problem. While conventional threaded discourse environments are powerful for promoting a diversity of ideas, they tend to be weak at encouraging the collapsing of messages into one larger idea, or the creation of a collective

summary. To address this shortcoming, KeC encourages the interplay between the expansion of ideas in the discussion mode and the synthesis of ideas in the wiki mode. To illustrate: In one of the current trials, graduate students discussed the educational potential of handheld computers in a KeC forum on the left side of the screen. As their discussion progressed, they periodically updated a wiki page summary on the right side of the screen. After some discussion, one of the students added a new sentence to the wiki page, "We still need to answer the big question, 'Do handhelds offer any advantages over laptops beyond cost? This inspired new discussion. This process continued to repeat, with an ongoing interplay between discussion messages on the left side of the screen, and summary statements and new ideas on the right side.

Method

We are currently conducting a series of design experiments (Brown, 1992) crafted to explore how to optimize the interplay between the idea expanding nature of the asynchronous discourse forum and the idea condensing nature of the wiki. Our first trial was conducted in an online graduate course in September-December 2009 (n=17). Our poster presentation will focus on this initial experiment. A second trial is currently underway. The online wiki pages, students interviews and a questionnaire serve as our primary data sources.

Results

The results of the initial trial suggest that the summary wiki page offers promise as a tool for representational guidance. The final wiki pages were judged to be excellent summaries of the course material. Interview data reveal that the high level of visibility associated with the wiki page's construction (i.e., people could easily see who made contributions, and the nature of those contributions) produced a heightened sense of accountability among students, which encouraged participation. However, some students felt that this visibility made people more reluctant to edit or delete the text of their classmates. Students were also cautious about making large-scale organizational changes to the wiki page, worrying that their actions might be viewed as presumptuous.

To move students beyond the construction of simple summaries, a number of scaffold labels were added to the wiki pages in December 2009. These scaffolds include: "Big ideas from this week", "Unresolved issues", "New ideas that move us ahead", and "What we don't understand yet". The goal of these scaffolds was to foster a deeper and more reflective collective analysis of the group's progress.

The full poster presentation will provide a more detailed account of the completed research and a demonstration of the Knowledge eCommons environment (if facilities for a demonstration are available).

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