

## Using a Graphical Interface to Address New Post Bias in Online Discussion Forums

Farshid Marbouti, Purdue University, 701 W. Stadium Avenue,  
West Lafayette, IN 47907, fmarbout@purdue.edu  
Alyssa Friend Wise, Simon Fraser University, 250-13450 102 Avenue,  
Surrey BC, Canada, V3T 0A3, afw3@sfu.ca

**Abstract:** This study investigated whether students exhibited different new-post reading behaviors when using a graphical discussion forum rather than a traditional text-based linear forum. Detailed examination of clickstream patterns in seven case studies showed several differences in reading strategies between the two forums. Most notably, in the graphical forum students read new posts in connection with other related (new or existing) posts, while in the text-based forum new-post reading was disconnected and scattered.

### Introduction

In the context of increasing online and blended courses in higher education, online discussion forums have become an important component of many university class experiences. Despite the potential benefits for supporting collaborative knowledge construction, online discussion forums have some typical shortcomings. One problem in many online discussion forums is that participants tend to only read posts that are flagged as new, and only reply to the most recent posts in the threads (“new post bias,” Chan et al., 2009; Hewitt, 2003). While it is important for students to read new posts as sources of new information, if students read *only* new posts, they may not be able to connect the ideas in the new posts to the content of the posts they have read previously. Thus, re-reading or skimming earlier discussion posts (even if read in a previous session) before reading more recent ones can help students to understand lower-level posts in context and avoid problems such as conversational drift, inadvertent thread death, and disregard for difficult questions (Hewitt, 2003).

While multiple factors contribute to new post bias, several scholars have pointed to the standard linear text-based discussion forum interface as a major cause (Hewitt, 2003; Swan, 2004). Following from this, Hewitt (2003) suggests that redesigning the interface may help prevent new post bias and its negative educational consequences. One promising redesign solution is a (non-linear) graphical interface that highlights the structure of the discussion instead of the chronological order of posts and reduces the emphasis placed on new-post flags. In this study, we investigated whether such a graphical discussion forum produced different student reading and replying behaviors than a traditional text-based linear forum with respect to new post bias.

### Graphical Interface

Figure 1 illustrates the graphical forum used in this study (Marbouti & Wise, 2013). The screen has been divided into two main areas: the graphical area (on the left), which represents the posts and their reply structure, and the content panel area (on the right), which contains the posts’ content and the reply form. In the graphical area, a node represents a post, and a link between two nodes represents the reply relation between two posts. Node size has been used to represent different levels of posts. In this graphical presentation, the discussion prompt and its top-level replies are presented by bigger nodes and more space is allocated to them, while lower-level posts are represented by smaller and closer nodes (see Figure 1a). Thus the learner can focus on a part of the discussion, while other parts are still visible. When a learner chooses to explore a branch of posts by selecting one, the selected post moves to the center and its replies are presented as bigger nodes (see Figure 1b). In this presentation, the learner can see the entire discussion and easily visualize the relations between posts and decide which posts to open, theoretically support more purposeful reading and replying behaviors by students.

### Methods

Participants were seven masters students who enrolled in an offering of a graduate course in which students met once a week and participated in online weekly discussions. This study took place two years after the course and participants were asked to engage with the graphical discussion in two sessions (equivalent to discussion log-ins). In the first session all posts were flagged as new. In the second session, a number of new posts were added to the discussion but the ones participants had read in the first session were no longer marked as new. In each session participants were asked to read some posts and make at least one post. A detailed log of all actions taken and think-aloud data was recorded. Participants’ log data during their participation in the same discussion in the original course (text-based interface) was extracted from the archived system for comparison. Log-file data was analyzed to produce microanalytic accounts of participants’ reading behavior in the graphical interface in both sessions and compare these with accounts of their behavior in two (comparable) sessions from their archived linear discussion forum activity. For details of microanalytic approach and procedures see Wise et al. (2012).

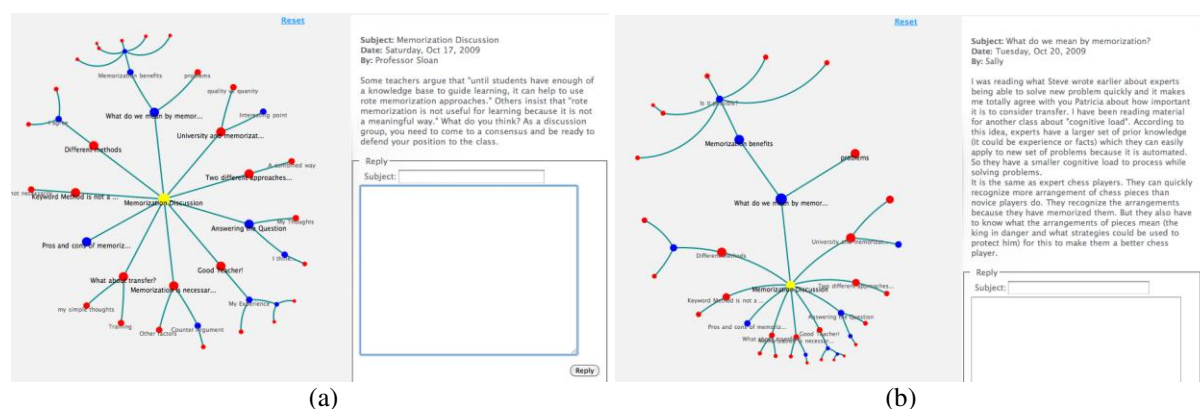


Figure 1. Graphical discussion forum including the graphical area and the content panel showing (a) the initial discussion prompt post and (b) a reply that has been selected to read (Marbouti & Wise, 2013).

## Results

In general, students showed interest in reading primarily new posts, regardless of which interface they were using. However, their strategy in reading new posts differed between the two forums, and also between students. In the graphical forum some students made an effort to re-read higher-level posts that they had read previously before reading their new replies. For example, one of the students, David (pseudonym), was interested in reading new posts; but as he described in the think-aloud, he decided to read the higher-level parent posts first (to refresh his memory about their content) before reading their new lower-level replies. This shows attention to reading posts in a connected fashion. In contrast, in his last session in the text-based forum David only read new posts from end of the list in a linear pattern, showing a classic example of new post bias.

There were also differences between the two interfaces in students' reading patterns even when students only read new posts. In the graphical interface, some students read the new posts in a connected fashion, viewing new top-level posts in each thread first and then their new lower-level replies. This suggests that even though students were interested in reading solely new posts, they were aware of the structure of the discussion and did not make their decision based *only* on the newness of the posts. In contrast, students in the text-based forum who read only new posts consistently ignored new top-level posts, immediately jumping to new lower-level reply posts. Thus their reading pattern was disjointed as they read posts in isolation from the context of the discussion. While one student in the text-based interface did mostly re-read posts that he had read previously, these posts were also scattered throughout the forum and not part of a connected series.

## Conclusion

This study investigated differences in students' reading behaviors in graphical and text-based discussion forums. The results documented the strong presence of new post bias in the linear text-based forum, instantiated as the reading of new and scattered posts. In the graphical forum students still focused on new posts; however, this often manifest as connected reading of new posts from higher-level to lower-level ones. This finding has led us to refine our consideration of the problem of new post bias to focus on the connectedness with which any posts (new or previously read) are accessed. In this respect, the graphical interface presents a promising mechanism for addressing the negative educational aspects of new post bias.

## References

- Chan, J. C. C., Hew K. F., & Cheung, W. S. (2009). Asynchronous online discussion thread development: Examining growth patterns and peer-facilitation techniques. *Journal of Computer Assisted Learning*, 25(5), 438–452.
- Hewitt, J. (2003). How habitual online practices affect the development of asynchronous discussion threads. *Journal of Educational Computing Research*, 28(1), 31–45.
- Marbouti, F. & Wise, A. F. (2013, April). *Design, implementation and testing of graphical interface to support interactions in online discussion forums*. Paper presented at Annual Meeting of the 2013 American Educational Research Association, San Francisco, CA.
- Swan, K. (2004). Learning online: Current research on issues of interface, teaching presence and learner characteristics. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education: Into the mainstream* (pp. 63–79). Needham, MA: Sloan Center for Online Education.
- Wise, A. F., Perera, N., Hsiao, Y., Speer, J., & Marbouti, F. (2012). Microanalytic case studies of individual participation patterns in an asynchronous online discussion in an undergraduate blended course. *The Internet and Higher Education*, 15(2), 108–117.