Using Asynchronous Online Discussions in Blended Courses: Comparing Impacts Across Courses in Three Content Areas

James Lehman
Jennifer Richardson
Peggy Ertmer
Timothy Newby
Xi Cheng
Chris Mong
Ayesha Sadaf

Abstract: Asynchronous online discussions are common in online and blended courses. This study examined the impact of online discussions in blended undergraduate courses in three disciplines: educational technology, engineering, and English education. Results showed that students from all courses were comfortable using online discussions and saw them as a way to express opinions and learn course content. However, differences in the outcomes for three groups suggest that certain online discussion strategies are more useful than others.

Introduction

Online and blended forms of learning are expanding rapidly in U. S. higher education. The sixth annual Sloan Consortium national survey of online learning in the U. S. (Allen & Seaman, 2008) found that over 3.9 million college and university students, about 20% of all higher education students, took at least one online course in the fall of 2007. Online learning enrollments in 2007 grew 12.9% compared to the previous year, a rate far in excess of the growth of the overall higher education student population. Blended or hybrid courses, those that combine elements of traditional face-to-face learning with elements of online learning, are also growing in popularity and are offered in proportions similar to fully online courses (Allen, Seaman, & Garrett, 2007).

Although many instructional strategies can be employed to foster student learning online (cf. Bonk & Zhang, 2008), one of the most widely used instructional approaches is the asynchronous online discussion. Asynchronous online discussions have been an integral part of many computer-mediated courses since the inception of this form of teaching and learning (Harasim, 1990; Hiltz & Turoff, 1993). In online courses, asynchronous discussions replace in-class discussions, while in blended or hybrid courses they can extend face-to-face discussions and provide another way for students to interact with each other and with the content. Today, numerous tools for conducting online discussions are available including those built into commonly used course management systems such as Blackboard, Angel, and Moodle. Although asynchronous online discussions are commonplace, relatively little has been written about their use in different disciplinary contexts. This study examined the use and perceived impact of online discussions in blended undergraduate courses in three different disciplines: educational technology, engineering, and English education.

Background

Developing group interaction and problem-solving skills is a goal in both education and the corporate world (Dundis & Benson, 2003). In corporations, employees must be able to communicate and solve problems within a team context. In education, standards (cf. *National Science Education Standards*, National Research Council, 1996) call for teachers to develop communities of learners, nurture collaboration among students, and structure and facilitate formal and informal discussions to promote student learning. *Rising Above the Gathering Storm*, the oft-cited report from the National Academies (2007), suggests that in order to create an environment and culture that support innovation in the U.S., our organizations must value social factors including "collaboration, communication, the treatment of multiple viewpoints" and utilize technological factors such as "access to high-speed computing and communications" (p. 417).

Asynchronous online discussions are one way to utilize computer-mediated communication to promote student collaboration and learning in the educational process. In online courses, asynchronous discussions serve as a stand-in for the dialogue and interchange typical of most face-to-face courses. In blended or hybrid courses, online discussions can extend face-to-face discussions beyond the confines of the classroom to increase students' engagement with the content and with one another. Students tend to respond positively to the asynchronous

discussion format because it allows them to participate at their convenience, gives them time to think about and consider points made by peers before responding, and keeps a written record of all contributions for review and reflection (Tiene, 2000). Students perceive online discussion to be more egalitarian than traditional classroom discussions (Harasim, 1990), and online discussions create a sense of social presence that helps to create community online (Gunawardena & Zittle, 1997; Rourke, Anderson, Garrison & Archer, 2001). According to Palloff and Pratt (1999), "The learning community is the vehicle through which learning occurs online. It is the relationships and interactions among people through which knowledge is generated" (p. 15).

This emphasis on a community of learners in the educational process mirrors the workplace where teaming, collaborative problem solving, and group inquiry, often conducted virtually, are becoming the norm. As technical workplaces have become increasingly computer-centered, virtual collaboration through computer networking has become an essential skill for success in the 21st century (Bourne, Harris, & Mayadas, 2005; Johnson, Suriya, Yoon, Berrett, & LaFleur, 2002). Online discussions have the potential to assist students in the construction of knowledge and serve as a scaffold that allows for multiple perspectives, negotiation of meaning, and an understanding of knowledge gaps a learner may possess (Haavind, 2006). A meta-analysis of the effects of distance education compared to classroom instruction found that students using media that supported asynchronous discussion in distance education significantly outperformed students in the traditional classroom (Lou, Bernard, & Abrami, 2006).

However, there are still many questions about the use of online discussions. For one thing, the use and efficacy of online discussions may differ across disciplinary contexts. This study, part of a larger project on the use of peer feedback in online discussions, investigated students' perceptions of the use of online discussions as part of hybrid/blended courses and their effect on students' motivational orientations and use of learning strategies in three different disciplinary contexts: educational technology, engineering, and English education.

Methods

This study was conducted in the fall of 2008 at a large Midwestern university. Participants were students enrolled in three undergraduate courses: an introductory educational technology course, an engineering digital systems design course, and an English education methods course. The courses were required for students in their respective disciplines. Students in the educational technology course were mostly freshmen and sophomores, and, on average, their prior experience with online discussions was limited (40% had no prior experience and another 29% had only one prior experience in a course with online discussions). Similarly, the engineering students were mostly sophomores with limited prior experience (36% had no prior experience and another 31% had only one prior experience). In contrast, the English education students were seniors nearing the end of a teacher preparation program with more experience using online discussions (78% had participated in three or more courses that had used online discussions).

The students in each course engaged in three online discussions related to course content as part of a blended approach that supplemented regular course activities during a 16-week semester. The educational technology and engineering courses each had face-to-face lecture and laboratory components; students' laboratory sections served as the grouping for the online discussions. In the English education course, the entire class participated in the online discussions as a supplement to regular face-to-face class meetings and discussions. Students in the educational technology course participated in discussions on learning theories, millennial students, and plagiarism. Students in the engineering course participated in discussions focused on homework problems on course concepts and exam preparation strategies. Students in the English education course participated in discussions on teacher identity, teaching literature, and action research. All online discussions were hosted in the discussion forum of Blackboard Vista.

To assess students' perceptions of the online discussions, at the end of the semester, students in all three courses were asked to complete an online survey that included questions about perceptions of the online discussions and their perceived impact. Completed surveys were received from students in the educational technology course (n=219), the electrical engineering course (n=103), and the English education course (n=18). Closed and open-ended items assessed students' comfort and confidence using the online discussions, advantages and limitations, and effects of the online discussions. Results of closed-ended items were tabulated, and outcomes for the three courses were compared to identify any differences in the responses of the three groups of students. Open-ended survey responses were analyzed using a simple pattern-seeking method to gather qualitative responses that were used for triangulation of the quantitative results. To assess participating students' motivational orientations and use of learning strategies, the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991) was administered on a pretest-posttest basis at the beginning and end of each course. Completed questionnaires were received from students in the educational technology course (n=172), the electrical engineering

course (n=93), and the English education course (n=20). The MSLQ subscale scores were tabulated and pretest-posttest scores were compared within groups to look for evidence of changes.

Results and Discussion

Students' Perceptions of Online Discussions

End-of-semester survey items were used to examine students' perceptions of the online discussions in each of the three classes. Table 1 presents the means and standards deviations for end-of-semester survey items dealing with comfort and confidence related to participating in the online discussions, collaboration/teamwork, and feedback from peers and instructors. Items were assessed on a 5-point Likert-like scale, from 1-low to 5-high, except for the collaboration/teamwork items, which were based on a 4-point scale. Means were calculated for each item.

Table 1
Comparison of Online Discussion Survey Means from the Three Courses

Survey Item	**Ed Tech Mean (SD)** (n=219)	**Engineering Mean (SD)** (n=103)	**English Ed Mean (SD)** (n=18)
Comfort/Confidence			
Comfort using online discussion tool	3.80 (1.06)	3.32 (1.21)	4.39 (0.85)
Comfort contributing to online discussions	3.72 (1.07)	3.12 (1.11)	4.28 (0.75)
Comfort commenting on others' contributions	3.59 (1.11)	2.96 (1.06)	3.94 (1.00)
Confidence in ability to contribute relevant ideas	3.84 (0.97)	3.16 (1.14)	4.28 (0.83)
Confidence in ability to benefit from discussions	3.41 (1.05)	3.15 (1.14)	3.00 (0.91)
Collaboration/Teamwork†			
Level of collaboration with peers as a result of online discussions	3.11 (0.72)	3.35 (0.79)	2.94 (1.06)
Feeling of teamwork among peers	2.86 (0.83)	2.88 (0.86)	2.72 (0.96)
Feedback			
Usefulness of feedback received from peers	3.18 (0.87)	3.21 (0.75)	2.78 (1.00)
Helpfulness of TAs' participation in online discussions	3.36 (1.02)	3.06 (1.36)	2.11 (1.32)

† Collaboration/Teamwork items used a 4-point scale; all other categories used a 5-point scale

Results related to comfort with and confidence in using the online discussions suggest that students in all three classes were relatively comfortable participating in the online discussions. Means for "Comfort using online discussion tool" were above 3 (neutral) for all three classes. The English education students had the highest comfort mean, which is not a surprise given that these students were mainly seniors who were more experienced with online discussions and were more familiar with their classmates than students in the other two classes. Means for "Comfort contributing to online discussions" and "Comfort commenting on others' contributions" were also above 3 for the educational technology and English education students; however, means for the engineering students were close to 3 (neutral), suggesting that these students were somewhat less comfortable contributing to the discussions and commenting on others' discussion posting. This may be related to the nature of the engineering class, which was not particularly discussion-oriented, and the online discussions in that class, which focused mainly on solving problems related to digital circuit design. The technical nature of these online discussions may have led students to be less comfortable making comments and less confident in their own contributions. Indeed, a similar response pattern is seen for "Confidence in ability to contribute relevant ideas" where the engineering students rated their confidence

lower than students from the other two classes. On the final comfort/confidence item, "Confidence in ability to benefit from discussions," the educational technology students demonstrated the highest level of confidence, while students in the other two classes gave more neutral responses, on average. The relatively lower means on this item, particularly for the engineering and English education students, suggest that students were uncertain about the value of the online discussions.

Students in all three classes tended to give positive ratings to the effects of the online discussion on their "Level of collaboration with peers as a result of online discussions" and "Feeling of teamwork among peers." Mean scores clustered around 3 on a 4-point scale (Table 1). This suggests that the students in all three classes perceived the online discussions as promoting collaboration with peers. The engineering students gave the most positive responses to these items. This is consistent with findings in a previous project semester (Lehman, Richardson, Ertmer, Newby, & Campbell, 2009) and may reflect the collaborative problem-solving culture in engineering. In the engineering course, students were used to working together to solve homework problems, and the online discussions helped to facilitate this process which may have contributed to a greater sense of collaboration and teamwork resulting from the online discussions among the engineering students.

For the "Usefulness of feedback received from peers" and "Helpfulness of TAs' participation in online discussions" items, mean scores for both the educational technology students and engineering students were above 3 on a 5-point scale, indicating somewhat positive responses. However, the means for the English education students were less than 3 indicating somewhat negative responses. These differences in response patterns likely reflect how the discussions were used in each course. In the educational technology course, students participated in well-structured discussions in which peers made contributions and teaching assistants (TAs) were active discussion facilitators. Not surprisingly, students rated instructor participation the highest in this course. In the engineering course, discussions were mostly peer-driven with occasional TA involvement to clarify a problem solution, for example. In the English education class, only the course instructor was involved; there were no TAs. As a consequence, students in the English education class gave the lowest rating to helpfulness of TA participation.

Student Perceptions of Outcomes

Students responded to survey items about the outcomes of participation in the online discussions including the perceived effect on their learning, attitudes toward peer learning, whether they had become better acquainted with classmates, and met with classmates outside of class. Results are shown in Table 2.

Table 2
Frequencies of Responses Related to Learning Outcomes by Course

Learning Outcome	**Ed Tech Students** (n=219)			**Engineering Students** (n=103)			**English Ed Students** (n=18)		
Perceived differences in learning	Yes 34.7%	No 36.5%	Unsure 28.8%	Yes 32.0%	No 46.6%	Unsure 21.4%	Yes 11.1%	No 72.2%	Unsure 16.7%
Attitudes toward peer learning	Pos 45.2%	Neg 20.6%	Neut 34.3%	Pos 37.9%	Neg 11.6%	Neut 50.5%	Pos 33.3%	Neg 11.1%	Neut 55.6%
Better acquainted with classmates	Yes 18.7%	No 68.0%	Unsure 13.2%	Yes 14.6%	No 69.9%	Unsure 15.5%	Yes 33.3%	No 61.1%	Unsure 5.6%
Met with classmates outside class	Yes 18.9%	No 81.1%		Yes 40.8%	No 59.2%		Yes 66.7%	No 33.3%	

A minority of students from all three courses (34.7% of educational technology students, 32.0% of engineering students, and 11.1% of English education students) felt that the online discussions made a difference in their learning. This is consistent with the responses to the "Confidence in ability to benefit from discussions" item reported above (see Table 1). Although some students perceived a learning value in the online discussions, more students did not or were neutral. However, a greater proportion of students reported a positive attitude toward peer learning (45.2% of the educational technology students, 37.9% of the engineering students, and 33.3% of the English education students). This is consistent with the "Level of collaboration with peers as a result of online discussions" item responses reported above (see Table 1). Relatively few of the students in any of the classes felt that they became better acquainted with their classmates through the online discussions. However, two-thirds of the English education students and two-fifths of the engineering students met classmates outside of class compared with less than one-fifth of the educational technology students. This is likely not so much the influence of the online discussions as it is a reflection of the cohesiveness of the students, in the case of the small English education class, or an outgrowth of the collaborative problem-solving culture in engineering, in the case of the engineering class where students often worked together on homework and to prepare for examinations.

Motivation and Learning Strategy Outcomes

To assess whether the online discussions might influence students' motivational orientations and use of learning strategies, we employed a pre- and post-test administration of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991). Results are shown in Table 3. For most of the subscales of the MSLQ, students' motivational orientations and use of learning strategies tended to show little change or declines from beginning to end of semester.

Students in the English education class showed the least changes from pre- to post-administration of the MSLQ. These students increased significantly on only one subscale, self-efficacy. Students in the engineering course showed declines on a number of the MSLQ subscales. The educational technology students showed a mixture of gains and declines on various subscales. Notable gains were observed in self-efficacy, intrinsic motivation, and peer learning. The MSLQ changes observed probably do reflect characteristics of the individual courses. For example, the gain in self-efficacy in the English education course makes sense when one considers that this was a methods course that was preparing students for their student teaching experience. The educational technology course had a popular group project that may have contributed to students' gains in self-efficacy, intrinsic motivation, and peer learning. The declines on several scales in the engineering course may be a function of the fact that this was a difficult beginning-level digital electronics course. However, it is doubtful whether any of these shifts can be attributed to the influence of the online discussions, which were only a small part of each of these three courses. In addition, the MSLQ post-administration occurred at the end of the semester, quite a while after completion of the online discussions. Thus, it seems likely that these results are confounded and so not particularly meaningful in assessing the impact of the online discussions.

Table 3
MSLQ Pre- and Post-Test Results by Course

	MSLQ Scale	n	Pretest Mean (SD)	Posttest Mean (SD)	Paired Samples t-value
Ed Tech	intrinsic motivation	172	4.69 (0.91)	4.91 (0.89)	3.12 **
	extrinsic motivation	172	5.59 (0.91)	5.44 (1.06)	-1.72
	task value	172	5.13 (0.97)	5.15 (1.01)	0.16
	control beliefs	172	5.21 (0.95)	5.34 (0.93)	1.66
	self-efficacy	172	5.24 (1.02)	5.84 (0.91)	7.09 ***
	test anxiety	172	4.12 (1.19)	3.85 (1.36)	-2.93 **
	rehearsal	172	4.40 (0.99)	4.42 (1.30)	0.17
	elaboration	172	4.72 (0.93)	4.54 (1.12)	-1.89
	organization	172	4.24 (1.08)	4.19 (1.38)	-0.46
	critical thinking	172	4.02 (1.00)	4.22 (1.23)	2.14 *
	self-regulation	172	4.24 (0.80)	4.32 (0.90)	1.21
	time study	172	5.11 (0.87)	4.55 (0.88)	-7.78 ***
	effort regulation	172	5.01 (1.10)	4.78 (0.96)	-3.02 **
	peer learning	172	3.01 (1.10)	3.72 (1.52)	6.24 ***
	help seeking	172	4.14 (1.10)	4.18 (1.09)	0.41
Engineering	intrinsic motivation	93	5.30 (1.02)	4.94 (1.16)	-3.39 **
	extrinsic motivation	93	5.72 (0.94)	5.31 (1.14)	-4.12 ***
	task value	93	5.73 (1.01)	5.25 (1.25)	-4.12 ***
	control beliefs	93	5.75 (0.88)	5.34 (1.09)	-3.60 **
	self-efficacy	93	5.64 (0.90)	5.05 (1.09)	-4.78 ***
	test anxiety	93	3.97 (1.34)	4.08 (1.27)	0.98
	rehearsal	93	4.27 (1.30)	4.28 (1.31)	0.08
	elaboration	93	4.99 (1.06)	4.81 (1.02)	-1.68
	organization	93	4.46 (1.36)	4.35 (1.33)	-0.73
	critical thinking	93	4.54 (1.38)	4.46 (1.22)	-0.56
	self-regulation	93	4.47 (0.88)	4.43 (0.84)	-0.50
	time study	93	5.01 (0.84)	4.51 (1.06)	-4.78 ***
	effort regulation	93	5.23 (0.98)	4.68 (1.04)	-5.45 ***
	peer learning	93	4.12 (1.34)	3.92 (1.41)	-1.44
	help seeking	93	4.21 (1.32)	3.91 (1.34)	-2.28
English Ed	intrinsic motivation	20	5.35 (0.87)	5.68 (0.80)	1.64
	extrinsic motivation	20	4.79 (0.96)	4.96 (1.02)	0.92
	task value	20	6.29 (0.63)	6.08 (1.00)	-1.07
	control beliefs	20	5.28 (0.86)	5.61 (0.94)	1.31
	self-efficacy	20	6.22 (0.67)	6.57 (0.52)	2.36 *
	test anxiety	20	3.38 (1.50)	3.10 (1.41)	-1.18
	rehearsal	20	3.93 (1.40)	3.58 (1.68)	-1.27
	elaboration	20	5.07 (1.02)	4.82 (1.19)	-0.85
	organization	20	3.63 (1.27)	3.43 (1.33)	-0.68
	critical thinking	20	4.56 (0.91)	4.55 (1.06)	-0.06
	self-regulation	20	4.41 (0.67)	4.34 (0.97)	-0.34
	time study	20	5.48 (0.84)	5.43 (1.14)	-0.37
	effort regulation	20	5.71 (0.97)	5.74 (0.91)	0.16
	peer learning	20	3.37 (1.19)	3.43 (1.87)	0.19
	help seeking	20	4.66 (0.84)	4.66 (1.12)	0.00

* $p < .05$, ** $p < .01$, *** $p < .001$

Advantages and Limitations

Students also responded to survey items that addressed the perceived advantages and limitations with respect to the online discussions. These are summarized in Table 4, which shows the percentages of students who identified specific advantages and limitations. Students could select more than one response, so percentages total to more than 100%.

The most commonly cited advantage for both the educational technology and English education students was that the online discussions "Made it easier to express opinions and to participate in class discussions." More than 60% of the educational technology students and more than 70% of the English education students identified this as an advantage. This is not a surprise given that discussion is a common instructional method in education, and online discussions allow all students in the class to readily participate. For the engineering students, the most commonly cited advantage was that the online discussions "Helped me understand the content better." More than half of the engineering students, as well as about half of the educational technology students, identified this as an advantage. The engineering course used the online discussions as a way for students to collaboratively work on homework problems and exam preparation strategies, and so it is not unexpected that the students would perceive advantages in learning the content. In the case of the educational technology course, the online discussions focused on several important topics in the course and so many of these students also perceived that the discussions were beneficial for learning course content. More than a third of both the educational technology and engineering students also cited "Motivated me to study the course materials or other related topics/content" as an advantage, whereas half of the English education students cited, "Helped me get better acquainted with my classmates."

The limitation most commonly cited by all three groups of students was that "It was hard to remember to do it." Nearly half of educational technology and engineering students and almost three-quarters of the English education students cited this as a limitation. Many of the students in these classes had relatively little prior experience with online discussions and were unaccustomed to this type of class participation, so it was easy for them to forget about this outside-of-class-time commitment. In hybrid or blended courses such as these, online discussions are an "extra" rather than an essential means of communication, so students may not perceive them as really important. Students also felt that "It took too much time;" this limitation was cited by about a quarter of the students in each of the classes. Both the educational technology and engineering students had some uncertainty about what to post and who was right/correct. These students, who were focused on content learning, seemed to be more concerned about being correct and knowing what was correct, something that was not always clear in the give and take of the online discussions. For the English education students, and to some extent the educational technology students, another limitation was that "It was hard deciding what score to give my peers;" this response was a result of the use of a peer feedback tool in the online discussions. Students were unfamiliar with the process of giving feedback to their peers, and so they were uncertain what they should do.

Students elaborated on the advantages and limitations of the online discussion in their responses to open-ended questions on the survey. Getting to learn from and share ideas with peers was a common theme among students who perceived the discussions as advantageous. As one educational technology student stated, "We don't get a chance to really discuss issues in class so this was a way for me to see what my classmates really thought." Another educational technology student noted, "It helped me also understand what my other classmates were thinking and that made me see where I was in the class and could compare my thoughts with their thoughts." An engineering student made a similar comment, saying, "I can see that there could be an advantage in being able to discuss a certain topic with classmates you would otherwise not speak to in lecture." For the educational technology and engineering courses, where large lectures made in-class participation difficult, the online discussions offered a convenient alternative way to share ideas with classmates. This was less of an advantage for the English education course, which was small and composed of a group of students that already knew one another fairly well. However, even one of the English education students commented that the online discussions, "Gave me an extra chance to get out my thoughts and ideas, or to elaborate on things we discussed in class."

However, a number of the students felt that the online discussions added little to their learning. One educational technology student commented, "I don't really think I have noticed any difference in my learning. I have always been a hands-on learner, and I actually prefer a face-to-face discussion over an online one. We spend too much time in front of a computer as it is." Another educational technology student said, "These discussions were interesting and something new, but I don't think they really changed anything about the way I learn." An engineering student noted that many students participated just because they were required to, saying, "I really do not think that online discussions are really that helpful as far as learning goes because a lot of times people just get on, which is usually kind of a pain, and write just to write rather than something meaningful." An English education student

commented, "I found that the online post was a restatement of what I learned in class and not a continuation or expansion of my ideas." So, for many of these students, the online discussions did not add enough value to what their classes already offered.

Table 4
Percentages of Students from Each Course Citing Online Discussion Advantages and Limitations

Advantages and Limitations	**Ed Tech Students** (n=219)	**Engineering Students** (n=103)	**English Ed Students** (n=18)
Advantages			
Helped me understand the content better	50.2%	52.4%	11.1%
Motivated me to study the course materials or other related topics/content	44.3%	34.0%	11.1%
Motivated me to spend time studying course materials *consistently* throughout the course (rather than cramming for the exam)	32.0%	26.2%	5.5%
Made it easier to express opinions and to participate in class discussions	61.2%	41.7%	72.2%
Helped me get better acquainted with my classmates	18.7%	14.6%	50.0%
Other	7.7%	13.6%	16.7%
Limitations			
It took too much time	25.1%	22.3%	27.8%
It was hard to remember to do it	47.5%	48.5%	72.2%
It was hard to ask questions or get help	16.4%	18.4%	5.5%
I was unsure about *how* to post	7.3%	7.8%	0.0%
I was unsure about *what* to post	26.9%	48.5%	11.1%
I didn't know how to respond to others' postings	28.3%	14.6%	27.8%
I didn't know who was right/correct	25.6%	40.8%	5.5%
It was hard deciding what score to give my peers	28.8%	9.7%	44.4%
Other	10.5%	12.6%	11.1%

As a final assessment of what students thought of the online discussions, a survey item asked if they were the instructor of the course would they continue the use of the online discussions as is, continue use but with changes, or discontinue use? Results from this item are shown in Table 5. Only a minority of students, less than one-fourth of the English education students and less than one-fifth of the educational technology and engineering students, would not continue using online discussions. Thus, a clear majority of the students would favor continuing the use of the online discussions either as used in the course or with changes (e.g., increasing or decreasing the number of discussions). This suggests the students did see value in this instructional approach.

Table 5
Student responses from the three courses concerning continuation of online discussions in course

	Ed Tech students (n=219)	Engineering students (n=103)	English Ed students (n=18)
Continue as is	41.1%	27.2%	47.1%
Continue with changes	42.0%	54.3%	29.4%
Do not continue	16.9%	18.5%	23.5%

Implications and Conclusions

Online and blended forms of learning are becoming increasingly important in higher education, and, as a result, there is increasing interest in the use of asynchronous online discussions. This study examined the use of online discussions and students' perception of their impact in three undergraduate blended courses in different disciplines. Results suggest that there is potential value in online discussions, but there are differences in the utility of online discussions across different content areas and challenges in implementing them effectively in undergraduate blended course environments.

The findings of this study showed that even students who are relatively inexperienced with online discussions can, over the course of a single semester, become relatively comfortable with this approach and confident in their ability to participate in online discussions as part of blended courses. However, the actual learning outcomes from participation in online discussions in blended courses and the value that students place on them are less obvious. Many students did seem to appreciate the value of online discussions for providing an avenue for expressing opinions and learning from peers. This may be of particular value for larger courses, such as two of the three in this study, where large lecture sessions limit the ability of students to participate in class. Many students also perceived value of the online discussions for helping them to learn course content. This was particularly true in the engineering and educational technology courses, which had a greater focus on content learning. However, many of the students did not see these benefits.

While previous research has suggested that students are satisfied with asynchronous online discussions and benefit from them (Johnson, 2006), only a minority of students in this study perceived a direct effect on their learning. Whereas the use of asynchronous discussions has been found to lead to performance benefits relative to traditional classrooms for distance education contexts (Lou, et al., 2006), it may be more challenging to use asynchronous online discussions effectively in blended learning courses for undergraduates where online discussions are not essential for student-to-student interaction.

The challenge for instructors of blended courses who wish to use online discussions is to find ways to maximize the perceived relevance and/or value of the discussions. According to Xie, Debacker, and Ferguson (2006), when students perceive online discussions as relevant, interesting, and enjoyable their value increases. In this study, the engineering students put the highest value of the online discussions on content learning. This result certainly reflects the way that the discussions were used in the engineering course (e.g., to help students with content problems and for exam preparation) as well as the culture in engineering which puts a premium on problem-solving and getting the right answer. On the other hand, the English education and educational technology students in this study rated the ability to express opinions and participate most highly, and this is consistent with the nature of these disciplines. Achieving concordance between purposes of the online discussion and the goals of the course obviously is important. So, instructors of blended courses should seek to use online discussions in ways that fit the discipline and content.

Other differences among the courses in this study also suggest important considerations for integrating online discussions. For example, in the educational technology course TAs were active discussion facilitators, and students in that course rated this aspect more highly than students in the other courses. According to Talient-Runnels, et al. (2006), instructor participation and scaffolding is important for effective learning from online discussions. So, efforts to use online discussions in blended courses should give consideration to how the discussions are facilitated for best effect.

For all of the courses, the biggest drawback cited by students was that they had difficulty remembering to participate in the online discussions. This is a particularly revealing finding that highlights an important difference between fully online and blended courses. In fully online courses, online discussions are typically the central vehicle for student-to-student and student-to-instructor communication. However, in blended courses, online discussions are an added form of communication that supplements or complements face-to-face interactions. For many of the students in this study, online discussions were perceived as an "extra" rather than as something integral

to the course and their learning. The challenge for instructors is to develop ways of utilizing online discussions in blended courses that take advantage of the unique features of the approach so that students will not perceive it as just one more thing to do. With effective design and implementation, asynchronous online discussions may be an effective tool for promoting student learning and collaboration in blended course environments.

References

Allen, I. E. & Seaman, J. (2008). *Staying the course: Online education in the United States, 2008*. Needham, MA: Sloan Consortium. Retrieved November 30, 2008, from http://www.sloan-c.org/publications/survey/downloadreports.

Allen, I. E., Seaman, J., & Garrett, R. (2007). *Blending in: The extent and promise of blended education in the United States*. Needham, MA: Sloan Consortium. Retrieved November 30, 2008, from http://www.sloan-c.org/publications/survey/downloadreports.

Bonk, C. J., & Zhang, K. (2008). *Empowering online learning: 100+ activities for reading , reflecting, displaying, and doing.* San Francisco, CA: Jossey-Bass.

Bourne, J., Harris, D., & Mayadas, F. (2005). Online engineering education: Learning anywhere, anytime. *Journal of Engineering Education, 94*, 121-146.

Dundis, S., & Benson, S. (2003). Building more effective virtual teams*:* An examination of the task variable in online group problem-solving. *International Journal on E-Learning*, October-December, 24-38.

Garrison, D. R., Anderson, T., & Archer W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7-23.

Gunawardena, C. & Zittle, F. (1997) Social presence as a predictor of satisfaction within a computer mediated conferencing environment. *American Journal of Distance Education, 11*, (3), 8-26.

Haavind, S. (2006). Key factors of online course design and instructor facilitation that enhance collaborative dialogue among learners. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Harasim, L. M. (1990). *Online education: Perspectives on a new environment.* Westport, CT: Greenwood Publishing.

Hiltz, S. R. & Turoff, M. (1993). *The network nation: Human communication via computer*. Cambridge, MA: MIT Press

Johnson, G. M. (2006). Synchronous and asynchronous text-based CM in educational contexts: A review of recent research. *TechTrends*, *50*(4), 46-53.

Johnson, S. D., Suriya, C., Yoon, S. W., Berrett, J. V., & La Fleur, J. (2002). Team development and group processes of virtual learning teams. *Computers and Education, 39*, 379-393.

Lehman, J. D., Richardson, J. C., Ertmer, P. A., Newby, T. J., & Campbell, J. (2009). Impact of asynchronous online discussions: A study of implementation in two large-enrollment blended courses. Ed-Media Proceedings 2009, pp. 2928-2936.

Lou, Y., Bernard, R. M., & Abrami, P. C. (2006). Media and pedagogy in undergraduate distance education: A theory-based meta-analysis of empirical literature. *Educational Technology Research and Development, 54*(2), 141-176.

National Academies. (2007). *Rising above the gathering storm: Energizing and employing America for a brighter economic future*. Washington, D. C.: The National Academies Press.

National Research Council. (1996). *National science education standards*. Washington, D. C.: National Academy of Sciences.

Palloff, R., & Pratt, K. (2007). *Building online learning communities: Effective strategies for the virtual classroom*. San Francisco: Wiley.

Rourke, L., Anderson, T., Garrison, D. R. & Archer, W. (2001) Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education, 14* (2), 50-71.

Talient-Runnels, M. K., Thomas, J. A., Lan, W. Y., Cooper, S., Ahern, T. C., Shaw, S. M., & Liu, X. (2006). Teaching courses online: A review of the research. *Review of Educational Research, 76*(1), 93-135.

Tiene, D. (2000). Online discussions: A survey of advantages and disadvantages compared to face-to-face discussions. *Journal of Educational Multimedia and Hypermedia*, *9*(4), pp. 369-382. Charlottesville, VA: AACE.

Xie, K., Debacker, T. K., & Ferguson, C. (2006). Extending the traditional classroom through online discussion: The role of student motivation. *Journal of Educational Computing Research*, 34 (1), 67-89.

Acknowledgement

The contents of this paper were developed under grant #P116B060421 from the Fund for Improvement of Post-Secondary Education (FIPSE), a program of the U.S. Department of Education. The contents of this paper were developed with the support of the grant, but the contents do not necessarily represent the views or policies of the Department of Education, and you should not assume endorsement by the Federal Government.