

A Survey of Factors Contributing to Learners' "Listening" Behaviors in Asynchronous  
Online Discussions

Alyssa Friend Wise, Farshid Marbouti, Ying-Ting Hsiao and Simone Hausknecht

Simon Fraser University

*Corresponding Author Information:* Dr. Alyssa Friend Wise, Simon Fraser University -

Faculty of Education, 250-13450 102 Avenue - Surrey BC, V3T 0A3, Canada

Phone: 778-782-8046 Fax: 778-782-8119 Email: [alyssa\\_wise@sfu.ca](mailto:alyssa_wise@sfu.ca)

**ABSTRACT:** Sixty-seven undergraduates taking either a Blended Business Course (BBC) or an Online Education Course (OEC) were surveyed about factors influencing their "listening" behaviors in asynchronous online course discussions. These are the ways they attend to the posts made by others: which posts they open, how they engage with open posts, and which posts they choose to respond to. Goal-orientations were also assessed. Results indicate that student decisions about which posts to open relied strongly on discussion reply-structure and message timing; authorship was important only to BBC students. Once open, OEC students often scanned posts to decide whether to read in-depth. In the BBC, similar triage strategies were used by work-avoidant students, while mastery students read posts thoroughly. In deciding which posts to reply to, BBC students favored posts that agreed with them while OEC students favored those that disagreed. Course and student characteristics that may account for these differences are discussed and implications for research and practice are presented.

**KEYWORDS:** Asynchronous Discussion, Online Learning, Blended Learning, Student Surveys, Learning Strategies, Student Participation, Goal-Oriented

## Introduction

With the rise of online and blended university courses (Allen & Seaman, 2011; Allen, Seaman & Garrett, 2007) asynchronous discussion forums have become an important tool for supporting student learning. Pedagogically, online discussions provide students opportunities to build understanding by engaging and negotiating with others (Boulos & Wheeler, 2007). In fully-online contexts, such discussions may be the primary locus for student interactions. In blended courses, they can increase continuity between face-to-face meetings and support more democratic participation (Poole, 2000). Despite this promise, actual online discussions often suffer from low levels of interactivity and coherence (Herring, 1999; Thomas, 2002), and thus fall far short of their potential.

Why do online discussions consistently suffer from these problems? One answer suggests that the problem starts before students compose their posts and relates to their lack of interaction with previously existing discussion posts (Hewitt, 2003; Hewitt, 2005; Peters & Hewitt, 2010; Wise, Hsiao, Marbouti, Speer, & Perera, 2012; Wise, Perera, Hsiao, Speer, & Marbouti, 2012; Wise, Speer, Marbouti, & Hsiao, 2012). Actions related to existing posts account for the vast majority of the time students spend in online discussions (Wise, Speer et al., 2012) and are important to consider as an element of participation since they are the primary vehicle through which students learn of each other's ideas. These actions are the result of students' decisions about which messages to view, how to engage with the opened messages, and which posts to respond to. To conceptualize these actions as part of interactive discussion processes, we refer to them collectively as "online listening behaviors" (Wise, Speer et al., 2012). This language differentiates these behaviors from the more generic act of reading (which can involve texts that are unitary, static, and cohesive as opposed to threaded discussions which are multi-authored, dynamic and segmented) and that of "lurking" (which implies a lack of subsequent contribution; e.g. Nonnecke, Preece, Andrews, & Voutour,

2004). For an expanded theoretical explanation of the notion of online listening see Wise, Speer et al. (2012). As listening behaviors affect the degree to which learners become aware of each other's ideas, they can be considered as a pre-condition for discussion interactivity (Wise, Hsiao et al., 2012). Conversely, a breakdown in these behaviors could explain the findings of incoherent discussions described above.

In past work we have examined online listening behaviors directly through analysis of log-file data (Wise, Speer et al., 2012; Wise, Perera et al. 2012; Wise, Hsiao et al., 2012). In this study we complement these mechanistic approaches by generating an understanding from the learner's perspective of the factors they see affecting these behaviors. We also probe the generality of these factors by examining data from two distinct contexts: a blended undergraduate business course and a fully online undergraduate education course. Finally, we examine the relationship between these factors and learners' intentions in participating in the online discussions to better understand how their choices may be driven by their achievement goals (Elliot & Murayama, 2008).

### **Understanding Students' Online Listening Behaviors**

The existing research base documents a variety of approaches to interacting with prior messages, many of them superficial. Looking at overall figures, Hewitt (2003) found that students often focus their attention on the most recently posted messages and those marked with "new" flags and Thomas (2002) found that many messages in an online discussion were never read by anyone at all. Moving beyond aggregate analysis, in our own work (Wise, Speer et al., 2012; Wise, Perera et al. 2012; Wise, Hsiao et al., 2012) we have probed differences in students' listening behaviors. While this work did reveal some superficial listening approaches, it also documented several more engaged listening patterns. These

include students who open a broad array of messages, those who orient towards particular authors, and those who concentrate their participation in few, but intense sessions.

While ours and others' past work has documented students' online listening behaviors, none of the studies mentioned thus far investigated students' reasons for them. A first look inside the student perspective was given by Peters and Hewitt (2010) who used interviews and surveys to collect information from a broad array of students who had participated in an online discussion at least once in their university career. Students in this study reported that a large volume of messages was a frustrating aspect of participating in online discussions. They also described strategies they used to help them deal with the overload such as skimming the discussion, reading threads selectively, and frequently checking for new messages. Students additionally reported attempting to appear knowledgeable in the discussion by saying what they thought the instructor wanted to hear and creating posts about things they already knew. This latter set of actions suggests that at least some students' motivations for discussion activity are oriented more towards being perceived positively than towards learning (Dweck & Legget, 1988).

While Peters and Hewitt's (2010) results are useful in understanding how students approach online discussions in general, they do not provide details about factors influencing the particular listening decisions students make. In addition, because the study included students whose online discussion experiences had come from a variety of courses, differences attributable to specific learning contexts could not be examined. In the current study we expand on their prior work by surveying students about specific factors contributing to their online discussion listening behaviors and by focusing data collection on students in two particular learning contexts. In addition, we follow-up on the issue of student motivation by examining the relationship between the factors learners indicate as important to them and their achievement goals (Dweck, 1986) for participating in the online discussions.

## **The Importance of Goal-Orientation**

Goal-orientation is a construct that describes how students approach learning activities (Dweck, 1986). A mastery orientation involves a focus on one's own learning and self-improvement, whereas a performance orientation refers to a focus on receiving a positive evaluation from others about one's abilities (Dweck & Legget, 1988). While early conceptualizations considered students as having a singular orientation, recent work suggests that these two orientations can be combined productively (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Kolić-Vehovec, Rončević, & Bajšanski, 2008). A final orientation that has been studied considerably is work-avoidance, in which students focus on exerting the minimal effort to get a task done (Meece, Blumenfeld, & Hoyle, 1988). In the context of online discussions, students' goal-orientations can affect how they approach and engage with others' ideas. For example, students with a mastery goal-orientation are likely to value the posts of others as sources of new information that may cause them to revise their ideas (Darnon, Butera, & Harackiewicz, 2007). In contrast, students with a performance orientation may see others' ideas as being in competition with their own (Darnon, Muller, Schragar, Pannuzzo, & Butera, 2006). By including an examination of goal-orientations in this study, we start to connect online listening behaviors with motivation to better understand how particular choices may be driven by how students approach the learning situation.

## **Research Questions**

1. What factors do learners use in making decisions about their listening behaviors in asynchronous online discussions as part of specific course experiences?
2. Is the importance of any of these factors predicted by learners' orientation towards particular goals for participation?

## Methods

### Courses, Discussions and Participant Recruitment

Participants were students enrolled in two undergraduate courses at a mid-sized Canadian university. Discussions in both courses took place in Phorum, a basic asynchronous threaded discussion forum.

The Blended Business Course (BBC) was an undergraduate course on organizational behavior enrolling 113 students and taught in a blended (face-to-face and online) model. The course was required for all business majors. The face-to-face elements of the BBC consisted of a two-hour weekly lecture and one-hour weekly tutorial. Students were also required to participate in three week-long (Sat-Fri) online discussions with half of their tutorial group (10-12 students) worth 9% of their grade. In each week's discussions students were asked to collectively solve an organizational behavior challenge. They were required to be "actively involved" in discussions, posting more than one comment per challenge. An initial invitation to participate in a survey about online listening behaviors was given in a face-to-face class; follow-up invitations were sent via email. Forty-seven students completed the questionnaire yielding a response rate of 42%.

The Online Education Course (OEC) was an undergraduate course on educational psychology enrolling 95 students taught fully online. The course was a prerequisite for several teacher preparation and graduate programs. In the OEC students were required to participate in six week-long (Mon-Fri) discussions in groups of 10 to 13 worth 20% of their course grade. Discussions asked students to resolve an applied educational debate and required at least three posts on different days in each discussion. Because the course was taught fully online, both initial and follow-up survey invitations were delivered electronically. Twenty students completed the questionnaire yielding a response rate of 21%.

Because of the low response rate, results for this course may not be representative of the class as a whole.

### **Data Collection and Analysis**

Participants completed an online questionnaire at the end of their course discussions. The questionnaire was developed to identify factors that learners perceived as important in influencing their online listening behaviors as well as probe student demographics, goal-orientations, past discussion experiences, and attitudes towards their course and its online discussion.

#### **Demographics.**

Students were asked to indicate their gender, age, year in university, cumulative GPA, and if English was their first language. Results are reported in Table 1.

#### **Past experience with discussion forums.**

Three 6-point items (“Never”-“Several times a day”) assessed participants’ prior experience with the internet and discussion forums in general and two 4-point items (“Never”-“More than twice before”) assessed participant’s prior experience using online discussion forums in academic contexts. One 6-point Likert-style item assessed participants’ comfort communicating in online discussions. Full items and results are reported in Table 2.

#### **Interest and ability in course, value of discussion forums.**

Participants’ Interest and Perceived Ability in the course materials were each assessed by four 6-point Likert items. Cronbach’s  $\alpha$  was .89 (Interest-both classes), .83 (Ability-BBC) and .87 (Ability-OEC). Perceived Value of the Discussion Forum was assessed by nine 6-point Likert items. Cronbach’s  $\alpha$  was .95 (both classes). Results are reported in Table 3.

### **Goal-orientation.**

Participants' goal-orientations were assessed along three dimensions (Mastery, Performance and Work-Avoidance); scales were designed independently and learners could rate high on more than one. Questions were five-point Likert-style items ("Not at all true of me"- "Extremely true of me") adapted from Elliot and Murayama's (2008) Achievement Goal Questionnaire-Revised (AGQ-R) and Nesbit, Zhou, Mahasneh, and Yeung's (2009) Goal-Orientation Questionnaire (GOQ). Cronbach's  $\alpha$ s were as follows: Mastery [six items;  $\alpha = .84$  (both classes)]; Performance [four items;  $\alpha = .80$  (BBC),  $.91$  (OEC)]; Work-Avoidance [three items;  $\alpha = .77$  (BBC),  $.23$  (OEC)]. The low reliability of the final scale is unexplained at this time; no further analyses were conducted for this data. Results for scales with sufficient reliability are reported in Table 3.

### **Online listening behaviors.**

Factors affecting three different kinds of online listening behaviors were probed: which posts students decided to open, how they interacted with these posts once they were open, and which posts they decided to reply to. Factors were generated based on previous research and salient features in the discussion forum; the full factor list is given in Table 4. The first set of factors probed student decisions about which posts to open using a 5-point Likert-style scale ("Not important at all"- "Extremely important"). A total of seven factors in four categories (Reply Structure, Author, Timing, Location) were included. A second set of factors related to student decisions about which posts to reply to was examined in a similar manner using twelve items in five categories (the prior four categories plus Post Contents). A final set of six items asked participants about the frequency with which they used different strategies to interact with open posts using a 5-point scale ("Never"- "Always"). Three items

asked about posts in general and three focused specifically on long posts. All item responses were examined individually and are reported by class in Table 4.

### **Multiple regression.**

To relate listening factors to goal orientations, standard multiple regressions were planned for each of the listening factors using the goal-orientation variables as predictors. The limited number of participants from the OEC and low reliability of the Work-Avoidance variable for this group precluded analysis on this portion of the data. In the BBC, 47 cases and three predictor variables yielded a ratio of 15.67, an acceptable figure for proceeding (Tabachnick & Fidell, 2001).

The three predictor variables were checked for multicollinearity. Correlation of Work-Avoidance with Mastery and Performance orientations was low ( $r(45) < .10$ ); correlation between Mastery and Performance orientations was moderate ( $r(45) = .54$ ). Normality, linearity, and homoscedasticity were checked through examination of residual scatterplots. Independence of errors was examined with the Durbin-Watson test using a .05 alpha level; in no model was the assumption shown to be violated. Residual scatterplots were also examined for outliers using a threshold of 2.5 standard deviations. Six outcome variables each had one outlying data point and an additional outcome variable had two outlying data points. Regressions were run both with and without outliers. For four of the models, removal of the outliers did not change the interpretation, thus equations based on all cases are reported. For three of the models, removing the outlying cases altered the interpretation to more closely align with goal-orientation theory, thus regressions are reported with the outliers removed.

## Results & Discussion

### Demographics and Past Experience with Discussion Forums

Demographics differed between participants in the two classes (see Table 1). In the BBC most participants were in their first two years of study and of standard university age. There was an even division of males and females and a small number of high achieving students; this matches standard enrollment for a required lower-level business course at the university. Less than a third of the respondents in the BBC listed English as their first language. While this is an extreme figure, it may reflect the high degree of multilingualism in this Canadian province (Statistics Canada, 2007) and/or self-selection in those who chose to respond to the survey. All students had fulfilled the university language admission requirements demonstrating English proficiency.

Table 1  
*Demographic information*

	Class Type	N	Percent of participants:				
			Female	In 1 <sup>st</sup> 2 years of university	Older than 22	High achievers ('A' GPA)	English is first language
BBC	Blended	47	51%	85%	6%	11%	28%
OEC	Online	20	80%	25%	55%	45%	90%

In the OEC, the vast majority of respondents indicated English as their first language. Participants from this class were mostly female and there were a large percentage of mature students and high achievers. A high proportion of females and some portion of mature students are typical for the OEC, a fully online offering of a core education prerequisite. However, course grades generally distribute widely, thus there appears to be some self-selectivity in those who responded to the survey.

Both classes' participants were frequent internet users (see Table 2). The majority of BBC participants were also familiar with discussion forums in casual contexts; participants from OEC reported less familiarity with these. Differences in experience with discussion forums in academic contexts were less pronounced and few participants from either class had used the discussion forum tool used in this study before. The majority of participants from both classes indicated that they were reasonably comfortable communicating through online discussion forums.

Table 2  
*Past experience with discussion forums*

% of participants who:	BBC	OEC
Use the internet at least once a day	96%	95%
Read online discussion forums in casual contexts several times a week or more	70%	35%
Post in online discussion forums in casual contexts several times a week or more	43%	20%
Participated in an online discussion forum as part of a class at least once before	60%	40%
Used Phorum discussion tool prior to this class	19%	10%
Were at least "somewhat comfortable" using discussion forums to communicate	64%	75%

### **Interest and Ability in Materials, Value of Discussion Forum, and Goal-Orientation**

The great majority of participants in both classes reported being interested in the course materials and saw themselves as high performers (see Table 3; splits based on scale midpoints). While almost three-quarters of BBC participants valued the discussion forum as part of their course, only half of those in OEC did. The cause of the lower figure for the OEC is unknown. One would expect students in the fully online OEC might value the interactivity that discussions provide; however, it is possible that the effort and timing they demanded conflicted with student expectations for the online course. Mastery and Performance

orientations were reported by a large proportion of participants in both classes, suggesting that as in previous studies (Harackiewicz et al., 2002; Kolić-Vehovec et al., 2008), the orientations were not in competition but could exist in combination. Almost half of BBC participants also displayed a Work-Avoidance Orientation.

Table 3

*Interest and ability in course material, value of discussion forum, and goal-orientation*

	BBC	OEC
Interest (% who were interested in the topics covered in this course)	85%	95%
Perceived Ability (% who saw self as high performer in course topic)	85%	95%
Value of Discussion Forum (% who valued it as a part of the course)	70%	50%
Mastery Orientation (% who tried to learn as much as possible)	77%	85%
Performance Orientation (% who tried to appear well in front of others)	89%	70%
Work Avoidance Orientation (% who tried to do the minimum necessary)	45%	-

### **Online Listening Behaviors**

Table 4 summarizes the importance students in each class placed on different factors affecting their online listening behaviors and shows the results of the multiple regression of goal-orientation on these factors for the BBC. Results for each of the three kinds of listening behaviors (which posts to open, how to interact with open posts and which posts to reply to) are discussed in turn.

#### **Determining which posts to open.**

##### ***Important factors.***

Results across the two classes showed several similarities, indicating there are some factors that may be generally important to students in deciding which posts to open. Reply

Table 4

*Factors affecting participants' listening behaviors by class and multiple regression results for BBC students*

Behavior	Category	Factor	Mean(SD)		Multiple Regressions for BBC students				
			OEC	BBC	F <sub>3,43</sub>	Adj R <sup>2</sup>	β (Mastery)	β (Perform)	β (Work Avoid)
Which Posts to Open	Reply	Replied to one of my posts	4.2 (1.1)	3.8 (1.1)	11.471***	.405	.157	.564***	.035
	Structure	High # of replies	3.2 (1.3)	3.6 (1.0)	F <sub>3,41</sub> =5.120***‡	.219	-.036	.519**	.092
	Author	Made by someone I know	2.7 (1.4)	3.3 (1.2)	2.352				
<i>Factor Importance</i> 6-pt scale	Timing	Marked as new	4.1 (1.1)	3.4 (1.2)	4.253*	.175	.274	.272	-.017
		Made recently	4.0 (.70)	3.0 (1.1)	1.486				
	Location	Near top of the screen	2.3 (1.4)	2.8 (1.2)	2.964*	.114	.193	-.101	.383**
		Near bottom of the screen	1.8 (1.0)	2.3 (1.0)	.255				
How to Interact with Open Posts	General	Read thoroughly	3.1 (.72)	3.6 (.85)	4.613**	.191	.366*	.111	-.253
		Scan to get the main idea	4.0 (.51)	3.6 (.91)	5.246**	.217	.116	-.041	.508***
		Scan to see if it was worth reading thoroughly	3.8 (.89)	3.6 (1.1)	3.840*	.156	.030	-.058	.461**
<i>Frequency of Strategy Use</i> 5-pt scale	Long Post	Didn't read	2.7 (.75)	2.7 (1.0)	3.133*	.122	.117	-.134	.413**
		Read a few lines to decide whether to read it	3.5 (.83)	3.0 (1.1)	2.939*	.112	.081	.036	.393**
		Read thoroughly anyway	2.6 (.76)	3.1 (.80)	2.470				
		Built on my ideas	3.1 (.64)	3.8 (.86)	3.240*	.127	.383*	-.038	.219
Which Posts to Reply to	Post Contents	Agreed with my ideas	2.2 (.93)	3.4 (1.0)	2.435				
		Provoked a question	3.9 (.88)	3.3(1.0)	2.634				
		With which I disagreed	3.6 (1.1)	3.3(.90)	1.468				
	Reply Structure	No other replies	1.8 (1.1)	2.5 (1.0)	1.687				
<i>Factor Importance</i> 6-pt scale	Author	Made by someone I know	1.7 (1.0)	3.0 (1.1)	2.215				
		Made a good student	2.0 (1.3)	2.8 (1.2)	1.757				
		Made recently	2.8 (1.3)	2.9 (1.1)	2.752				
	Timing	One of the first posts read	1.8 (.97)	2.6 (1.2)	5.439**	.224	.345*	-.130	.433**
		One of the last posts read	2.2 (1.1)	2.5 (1.1)	5.805**	.239	.249	-.285	.488***
	Location	First post in a long thread	2.1 (1.1)	2.7 (1.1)	F <sub>3,42</sub> =3.442*†	.140	.521**	-.309	.132
Last post in a long thread		2.2 (1.2)	2.5 (1.0)	F <sub>3,42</sub> =5.486**†	.230	.367*	-.319	.443**	

\* p&lt;.05 \*\* p&lt;.01 \*\*\* p&lt;.001

‡ cases 90 and 117 removed; † case 120 removed

structure was one of the most important categories of factors for participants in both classes. In particular students reported an interest in those threads that they had already been involved in, and also those which had drawn the most attention from other students. This suggests an attention to the group's dynamic and that encouraging students to create fewer but more populated threads may stimulate students to open more posts. Timing factors were also indicated as important for both classes. This result expands Hewitt's (2003) finding that students tend to read messages marked with "new" flags, by indicating that this is a conscious and purposeful choice. Timing factors were relatively more important for OEC students than BBC; this may be due to the higher posting volume required in the course and thus a greater perceived need for efficiency.

While Peters and Hewitt's (2010) study reported authorship as a generally influential factor for students in deciding which posts to read, in this work it was an important factor for BBC, but not OEC, participants. This suggests that some factors contributing to students' online listening behaviors are contextually based. Students in the BBC saw each other in person twice a week; as documented previously by Cheung, Hew & Ng (2008), face-to-face relationships can play a strong role in influencing choices related to discussion forum participation. In contrast, the students in the OEC never saw each other in person; while they certainly could have still developed connections with each other, the limited importance of authorship as a selection factor in this case suggests that they did not do so extensively.

### ***Relationship with goal-orientations***

For BBC students, four factors related to which post to open were significantly predicted by goal-orientations overall: both of the reply structure factors, one timing factor, and one location factor. The reply structure factors (replied to one of my posts and high number of replies) were both significantly predicted by a Performance orientation. This may imply that in order to present the appearance of a "good" student, performance oriented

learners engage in active threads and those in which they are already a part of the dialogue. From a collaborative knowledge construction perspective, engaging (and re-engaging) with active parts of the discussion is desirable; however, it is also important to consider *how* students engage in reading these threads. For example, reading posts that reply to one's own post may be due to a sense of social reciprocity rather than an engagement with the issues (Cheung et al., 2008; Wise, Perera et al. 2012; Wise, Hsiao et al., 2012) or may facilitate attempts to appear knowledgeable (Peters & Hewitt, 2010).

One location factor (near the top of the screen) was significantly predicted by a Work-Avoidance orientation; this suggests that in trying to exert a minimum of effort, these students let the interface dictate their listening behaviors. This behavior is new to the literature and merits attention in future research. Because posts at the top of the screen are generally the oldest ones in the discussion, focusing on them does not prepare a student to join the discussion where it is currently in progress and may lead students to respond to questions that the group has already resolved. As a result, this behaviour may create the inverse problem of students reading only the newest posts (see Hewitt, 2003; 2005). No factors related to which posts to open were significantly predicted by a Mastery orientation. This may indicate that these students were more comprehensive in their reading or that they did not find any appropriate factors available with which to determine what posts to read.

### **Determining how to interact with open posts**

#### ***Important strategies***

The strategies used to interact with open posts differed substantially between the classes (see Table 4). While BBC students reported using all strategies about equally, students in the OEC exhibited greater selectivity in whether they chose to fully read a post and were more likely to initially scan a post or read a few lines to determine whether to continue reading. The variations in strategy may be due to several differences between the

groups. First, the OEC had a higher posting volume compared to the BBC (three versus one minimum posts per week); thus, similar to Peters and Hewitt's (2010) findings, participants may have used these triage strategies to cope with an overwhelming number of posts.

Second, OEC participants were generally older and higher-performing than those in the BBC; it is possible that these strategies result from past successful use of other selective approaches to studying. However, online discussions are different from other class-based reading in that they include responsive and interactive components that strongly depend on what is read as a collective whole. Thus it is possible that inappropriate transfer of reading strategies from other contexts is one factor contributing to fractured and incoherent conversations.

#### ***Relationship with goal-orientations***

For BBC students, all except one of the strategies for interacting with open posts were predicted by goal-orientations. Reading thoroughly for posts in general was predicted by a Mastery orientation. This may be due to these students' interest in the class and their desire for learning (Harackiewicz et al., 2002). In contrast, reading thoroughly for long posts was not predicted as a frequently used strategy by any of the goal-orientations. This resonates with Peters and Hewitt's (2010) finding that students find lengthy posts a frustrating factor in online discussions. If long posts are frustrating and seldom read (even by mastery oriented students), it may be important to give students guidelines for post creation that encourages concise expression of ideas. This in turn could lead to an increase in the proportion of posts that are read by students, thus supporting more coherent discussions.

Four strategies in choosing how to interact with open posts were predicted by a Work-Avoidance orientation; three involved scanning posts (either to get the main idea or to decide if to read more) and one was to not read a post (if it was long). Since work-avoidant students try to complete courses with the least amount of effort, these strategies appear to have been used to limit workload by superficially satisfying the need to read others' posts.

**Determining which posts to reply to*****Important factors***

Participants in both courses indicated that factors related to the content of posts were the most important in deciding who to reply to (see Table 4). This indicates that at a basic level students are concerned with relating their ideas to those of others. Within the content category, different foci were seen for the two classes. Participants in the BBC placed the most importance on replying to posts that built on their idea, while participants in the OEC put more emphasis on replying to posts that provoked questions or with which they disagreed. This is an important distinction because engaging with differing perspective is a core process for learning through online discussions: it can support deeper examination of ideas (West, 2000), the reasons for them (Darnon et al. 2007), and encourage the development of more purposeful and better supported positions (Clark, Sampson, Weinberger, & Erkens, 2007; Price, Cappella, & Nir, 2002). The inclination to address differing opinions in the OEC may be related to a task structure that specifically asked students to resolve a debate; it may also be in part influenced by a participant group that was on average older and higher achieving.

In the BBC authorship was an also an important factor in deciding which posts to reply to. This may be due to concerns with social reciprocity as discussed earlier, and/or students' increased comfort in replying to known post authors for whom they can anticipate how their comments will be received (Ng, Cheung & Hew, 2009).

***Relationship with goal-orientations***

For BBC students, five factors related to which post to reply to were significantly predicted by goal-orientations: one content factor, two timing, and two locations factors. The content factor (replying to posts which built on the learner's ideas) was associated with a Mastery orientation. This supports the idea that students with a mastery orientation may see others as sources of new information (Darnon et al., 2006), thus when a student's post builds

on their ideas they consider it important to reply. However, it is concerning that mastery-oriented students did not also focus on replying to posts with which they disagreed or that asked a question. This suggests they may not understand the importance of engaging with different perspectives as part of the learning process.

Mastery orientation also predicted the importance of several timing and location factors: replying to the first or last post in a long thread or to one of the first posts read overall. The importance of the latter two factors was additionally predicted by a Work-Avoidance orientation, as was replying to one of the last posts read overall. This similarity in patterns for mastery and work-avoidant students is unexpected. It is possible that in the context of an overwhelming numbers of posts, many students rely on superficial timing and location factors to some extent. It is also possible that differently oriented students might have distinct reasons for interacting with the same post. For example, in replying to the last post in a long thread, mastery-oriented students may be addressing the whole thread by continuing the conversation where it left off; in contrast, for a work-avoidant student who scanned most of the posts it may have simply been a convenient place to post logistically. This is a conjecture that needs to be tested empirically. Regardless of the reason, replying only to the last posts in a thread can have negative consequences for a discussion (Hewitt, 2003; 2005) such as causing important higher-up threads to die and allowing for unintended drift in the discussion.

### **Limitations**

There were a number of limitations in the study. First, the closed-ended questionnaire only allowed participants to respond about the importance of pre-determined factors. Other factors and strategies than those studied here may also be relevant. Another limitation is potential differences in the factors students reported as important and those they actually relied on in discussions. Nonetheless, it is useful to understand what students believe they do

and what they are aware of in regards to their actions. This information can be complemented with studies that examine what students actually do in fine detail (e.g., Wise, Perera et al. 2012, Wise, Hsiao, et al., 2012), allowing for comparison of perceived and actual behaviors.

This study was also limited by a low response rate in one of the classes. Findings for this group may not be representative of the class as a whole. In particular, the relatively large percentage of high achievers suggests a skew towards a distinct segment of the class population. However, the results found are valid for students with these characteristics in this context. The low response rate also did not permit a multiple regression on goal-orientations for this class, thus it was not possible to make comparisons across the two courses in this respect. Finally, this study only examined listening behaviors in two specific course settings; other kinds of courses and students should be examined to determine the robustness and generality of these findings

### **Implications for Research and Practice**

Several implications for practice have already been mentioned. In particular, encouraging students to create concise posts that build on existing threads was suggested as a way to support students in reading a greater portion of the discussion and thus being better prepared to engage in a coherent discussion. In addition the increased use of timing-related factors and scanning strategies in the high-volume OEC suggests that when a greater number of posts per participant are required, it may be prudent to reduce the group size to keep the total number of posts manageable for students.

Another area in which students need support is in engaging with posts that question or disagree with their ideas. The finding that students in the debate-oriented OEC reported replying more frequently to these kinds of posts suggests that discussion tasks can be designed to support argumentative discourse. To examine these effects more precisely, we are currently conducting an experimental study comparing the listening and speaking

practices of students in online discussion groups assigned an open-ended problem-solving task with those given the same problem with a set of contrasting alternatives to choose between. Additional techniques for increasing student engagement with dissonant ideas include giving specific instructions on how to discuss argumentatively (Spatariu, Hartley, Schraw, Bendixen, & Quinn, 2007) and assigning provocative student roles such as a Devil's Advocate or Questioner (Wise, Saghafian & Padmanabhan, 2012).

Particular attention should also be paid to work-avoidant students who reported several unengaged behaviors such as only opening posts near the top of the screen, scanning instead of reading posts, and making a reply to one of the first posts they read. These actions may result from a lack of understanding of the value of the online discussion, or a lack of engagement in the course overall. In the former case, instructors may find it worthwhile to spend time at the start of a course explaining the purpose of online discussions as a vehicle for helping students build (and change) their ideas by interacting with others. Another way to encourage students to engage with the posts of others is by assigning Synthesizer and Wrapper roles (Wise, Saghafian et al. 2012). When students are given the responsibility to make a post summarizing the groups' discussion, they tend to read a greater proportion of the posts in the discussion (Wise & Chiu, in review).

Other findings from this study merit further investigation before practical implications can be drawn. One is the value of authorship as a factor influencing the posts students choose to read and reply to. If students identify others who make high quality contributions and choose to read their posts consistently, this could serve as positive reinforcement for making good comments. However, if the choice of who to reply to is based on social groups or reciprocity (Cheung et al., 2008; Wise, Perera et al. 2012; Wise, Hsiao et al., 2012), then it may not provide any cognitive benefits and detrimentally, may leave some students excluded. Regardless, it can lead to patterns where individuals choose the same people to converse with

repeatedly, potentially limiting the diversity of ideas with which they interact. Future research can use techniques such as social network analysis to investigate different listening and speaking patterns in groups' online discussions and examine their relationship to overall discussion quality.

Finally, the finding that mastery students found few clues to guide them in determining which posts to open suggests a need to reconsider the design of discussion forum interfaces (Kim & Johnson, 2006; Teplov, 2008). Typical online discussion forum interfaces represent posts in threads as a text-based chronological list with indenting (though c.f. Scardamalia, 2004). These long lists do not make the structure of the discussion visually salient and as a result students can have difficulties navigating effectively (Dringus & Ellis, 2005). This structure also visually privileges posts made at the beginning or end of the discussion; comments added to the middle of the discussion can easily go unnoticed (Hewitt, 2003). To address these issues we have developed a prototype of a new graphical interface that highlights the structure of the discussions by representing posts as nodes in a branching tree with connections based on their reply relations (Marbouti, 2012). Current research is examining the impact of the new interface on students' listening behaviors, in particular its affordances and limitations in guiding students in making more purposeful choices of which posts to open. Future work can also explore whether additional cues for choosing posts to open can be generated by learners themselves, for example as part of a post "reputation" system in which students can recommend valuable posts for others to read (Hewitt, 2011).

### **Conclusion**

Little previous work has looked in detail at the factors contributing to learners' interactions with online discussion forums in the process leading up to their contributions. These online listening behaviors are an important part of the knowledge construction process that influence learners' awareness of each other's ideas; thus, promoting such interaction is a

critical first step to supporting collaborative knowledge building in online discussions. This study generated an initial understanding of the specific factors learners use in determining their online listening behaviors and their relationship with different kinds of achievement goals. Certain factors were generally important while others were context-specific or related to students' motivations for participating in the discussions. Future work can build on this foundation by examining factors influencing listening behaviours in other contexts, comparing student reports with actual behaviors, and designing instructional and technological systems to support more productive listening behaviors. In this way we can begin to address the challenges of non-interactive and disjointed conversations and move towards discussions in which students engage with each other's ideas as they learn together.

### References

- Allen, I.E. & Seaman, J. (2011). *Going the distance: Online education in the United States*. Needham, MA: The Sloan Consortium. Retrieved from [http://sloanconsortium.org/publications/survey/going\\_distance\\_2011](http://sloanconsortium.org/publications/survey/going_distance_2011)
- Allen, I.E., Seaman, J., & Garrett, R. (2007). *Blending in: The extent and promise of blended education in the United States*. Needham, MA: The Sloan Consortium. Retrieved from [http://www.sloan-c.org/publications/survey/pdf/Blending\\_In.pdf](http://www.sloan-c.org/publications/survey/pdf/Blending_In.pdf)
- Boulos, M.N., & Wheeler, S. (2007). The emerging web 2.0 social software: An enabling suite of sociable technologies in health and health care education. *Health Information and Libraries Journal*, 24, 2-23.
- Cheung, W.S., Hew, K.F., & Ng, C.S. L. (2008). Toward an understanding of why students contribute in asynchronous online discussions. *Journal of Educational Computing Research*, 38(1), 29-50.

- Clark, D.B., Sampson, V., Weinberger, A., & Erkens, G. (2007). Analytic frameworks for assessing dialogic argumentation in online learning environments. *Educational Psychology Review*, 19, 343–374.
- De Dreu, C.K. W., & West, M.A. (2001). Minority dissent and team innovation. *Journal of Applied Psychology*, 86, 1191–1201.
- Darnon, C., Muller, D., Schragar, S.M., Pannuzzo, N., & Butera, F. (2006). Mastery and performance goals predict epistemic and relational conflict regulation. *Journal of Educational Psychology*, 98(4), 766-776.
- Darnon, C., Butera, F., & Harackiewicz, J.M. (2007). Achievement goals in social interactions: Learning with mastery vs. performance goals. *Motivation and Emotion*, 31, 61-70.
- Dringus, L. P., & Ellis, T. (2005). Using data mining as a strategy for assessing asynchronous discussion forums. *Computers & Education*, 45(1), 141–160.
- Dweck, C.S. (1986). Motivational processes affecting learning. *American Psychologist*, 41, 1040-1048.
- Dweck, C.S., & Leggett, E.L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256–273.
- Elliot, A., & Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application. *Journal of Educational Psychology*, 100, 613-628.
- Harackiewicz, J.M., Barron, K.E., Pintrich, P.R., Elliot, A.J., & Thrash, T.M. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology*, 94, 638–645.
- Herring, S. (1999). Interactional coherence in CMC. *Journal of Computer-Mediated Communication*, 4(4). DOI: 10.1111/j.1083-6101.1999.tb00106.x
- Hewitt, J. (2003). How habitual online practices affect the development of asynchronous discussion threads. *Journal of Educational Computing Research*, 28(1), 31-45.

- Hewitt, J. (2005). Toward an understanding of how threads die in asynchronous computer conferences. *Journal of the Learning Sciences, 14*(4), 567-589.
- Hewitt, J. & Brett, C.M. (2011). *Recommend: A tool for identifying key ideas in asynchronous discourse environments*. Paper presented at Annual Meeting of the American Educational Research Association, April, 2011, New Orleans, LA.
- Kim, B., & Johnson, P. (2006). Graphical interface for visual exploration of online discussion forums. *Journal of Systemics, Cybernetics and Informatics, 4*(4), 43-47.
- Knowlton, D.S. (2005). Taxonomy of learning through asynchronous discussion. *Journal of Interactive Learning Research, 16*(2), 155-177.
- Kolić-Vehovec, S., Rončević, B., & Bajšanski, I. (2008). Motivational components of self-regulated learning and reading strategy use in university students: The role of goal orientation patterns. *Learning and Individual Differences, 18*, 108-113.
- Marbouti, F. (2012). *Design, implementation and testing of a visual discussion forum to address new post bias*. (Unpublished masters thesis). Simon Fraser University: Burnaby, Canada.
- Meece, J.L., Blumenfeld, P.C., & Hoyle, R. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology, 80*(4), 514-523.
- Nesbit, J.C., Zhou, M., Mahasneh, R., & Yeung, P. (2009). *The Goal Orientation Questionnaire (GOQ)*. Simon Fraser University. Available at <http://www.sfu.ca/~jcn Nesbit/EDUC220/StratRef/GOQ.htm>
- Ng, C.S.L., Cheung, W.S., & Hew, K.F. (2009). Sustaining asynchronous online discussions: Contributing factors and peer facilitation techniques. *Journal of Educational Computing Research, 41*(4), 477-511.

- Nonnecke, B., Preece, J., Andrews, D., & Voutour, R. (2004). Online lurkers tell why. *Proceedings of the Tenth Americas Conference on Information Systems*, New York, NY, 2688-2694.
- Peters, V.L., & Hewitt, J. (2010). An investigation of student practices in asynchronous computer conferencing courses. *Computers and Educations*, 54(4), 951-961.
- Poole, D.M. (2000). Student participation in a discussion-oriented online course: a case study, *Journal of Research on Computing in Education*, 33(2), 162-177.
- Price, V., Cappella, J.N., & Nir, L. (2002). Does disagreement contribute to more deliberative opinion? *Political Communication*, 19(1), 95-112.
- Scardamalia, M. (2004). CSILE/Knowledge Forum®. In *Education and technology: An encyclopedia* (pp. 183–192). Santa Barbara, CA: ABC-CLIO.
- Spatariu, A., Hartley, K., Schraw, G., Bendixen, L.D., & Quinn, L.F. (2007). The influence of the discussion leader procedure on the quality of arguments in online discussions, *Journal of Educational Computing Research*, 37(1), 83-103.
- Statistics Canada (2006). Population by mother tongue and age groups, 2006 counts for Canada, provinces and territories. Retrieved from <http://www12.statcan.ca/census-recensement/2006/dp-pd/hlt/index-eng.cfm>.
- Swan, K. (2003). Learning effectiveness: What the research tells us. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education: Practice and direction* (pp. 13-45). Needham, MA: Sloan Center for Online Education.
- 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.

- Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics*. Needham, MA: Pearson Education.
- Teplovs, C. (2008). *The knowledge space visualizer: A tool for visualizing online discourse*. Paper presented at the Common Framework for CSCL Interaction Analysis Workshop at the International Conference of the Learning Sciences 2008. Utrecht, NL.
- Thomas, M.J.W. (2002). Learning within incoherent structures: the space of online discussion forums. *Journal of Computer Assisted Learning*, 18(3), 351-366.
- West, M. A. (2000). Reflexivity, revolution, and innovation in work teams. In M. M. Beyerlein, D. A. Johnson, & S. T. Beyerlein (Eds.), *Product development teams* (Vol. 5, pp. 1–29). Stamford, CT: JAI Press.
- Wise, A. F., & Chiu, M. M. (in review). The effects of summarizing roles on learner's listening behaviors in online discussions.
- Wise, A. F., Hsiao, Y. T., Marbouti, F., Speer, J. & Perera, N. (2012). Initial validation of listening behavior typologies for online discussions using microanalytic case studies. In J. van Aalst, J. K. Thompson, K. M. Jacobson, & P. Reimann (Eds.) *The Future of Learning: Proceedings of the 10th International Conference of the Learning Sciences – Volume 1, Full papers* (pp. 56-63). Sydney, Australia: International Society of the Learning Sciences.
- 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. *Internet and Higher Education*, 15(2), 108–117.
- Wise, A. F., Saghafian, M. & Padmanabhan, P. (2012). Towards more precise design guidance: Specifying and testing the functions of assigned student roles in online discussions. *Educational Technology Research and Development*, 60(1), 55-82.

Wise, A. F., Speer, J., Marbouti, F. & Hsiao, Y. (2012). Broadening the notion of participation in online discussions: Examining patterns in learners' online listening behaviors. Advance online publication. *Instructional Science*. DOI 10.1007/s11251-012-9230-9.

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