Relationship between Students' Motivation and their Participation in Asynchronous Online Discussions

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Abstract

This study investigated the relationship between students' motivation and their participation in asynchronous online discussions during a 16-week online course. Fifty-six students participated in online discussion activities as a normal part of their classes. Their motivation for participating in online discussions was self-reported three times throughout the semester. The findings continue to indicate that students' motivation has a significant relationship with their participation in online discussion activities at time two and time three. Students' perceived value, autonomy, competence, and relatedness have different levels of impact on their online discussion behavior. This study also found that students' intrinsic motivation and their perceived value of online discussions remained at a moderate-high level over time, although the perceived value had a significant drop from the mid-point to the end of the semester.

Keywords: Asynchronous Online Discussion, Motivation, Distance Learning, Collaborative Learning, Learning Community

Introduction

Distance learning has enabled universities and colleges to extend learning opportunities to students who would not otherwise be able to participate in the benefits of education due to time and location constraints (Gunawardena & McIsaac, 1996). In distance learning settings, asynchronous online discussions have become widely used to support student interactions. An asynchronous online discussion is a text-based computer-mediated communication that allows human-to-human interaction without time and location constraints (Romiszowski & Mason, 1996). Almost all current web-based course management systems, such as, Blackboard, and Moodle, have a component that supports asynchronous online discussions. Research suggests that asynchronous online discussions have many positive impacts on distance learning. Online discussions enable convenient interactions among learners and instructors. This interaction extends collaborative knowledge construction and information distribution outside of classrooms (Lipponen, 2000; Paavola, Lipponen, & Hakkaraine, 2002; Scardamalia Bereiter; 1994; Xie, DeBacker, Ferguson, 2006) and supports cognitive and metacognitive engagement and complex reasoning and argumentation (Brown, Ellery, & Campione, 1998; Hoadley & Linn, 2000). The utilization of online discussions also facilitates social and cultural aspects of collaborative learning, such as, learners' social presence (Picciano, 2002; Tu & MaIsaac, 2002), situated cognition (Brown, Collins, & Duguid, 1989), and community of practice (Lave & Wenger, 1991). One factor that has been suggested as a predictor of success in distance learning is the level of students' technical skills (Buchanan, 1999; Noah, 2001), while other studies were unable to find a relationship between students' technical skills and success or participation levels in online courses (DeTure, 2004; Liao, 2005). Attitude toward online classes also has been linked to the use of online discussions and a sense of community students feel (Drouin, 2008; Moisey, Neu, & Cleveland-Innes, 2008). One

interesting aspect of Drouin's study, was that a closer examination into student-student and student-instructor interactions revealed that only student-student interactions were related to students' sense of community.

Research recognizes that the quality of online discussions is heavily dependent on learners' motivational development (Cheung, Hew, & Ng, 2008; Hakkarainen, Jarvela, Niemivita, 1999; Jones & Issroff, 2005; Tuckman, 2007; Xie, DeBacker, Ferguson, 2006). The literature related to unsuccessful cases of online discussion implementation attributes the lack of success to low levels of participation (e.g., Mazzolini & Maddison, 2003), insufficient peer referencing (e.g., Hewitt, 2005), superficial interaction (e.g., Weinberger, 2003), and unwillingness to build joint efforts (e.g., Grasel, Fischer, Bruhn, & Mandl, 2001). These factors are encompassed in Deci and Ryan's Intrinsic Motivation variables: enjoyment, perceived value, autonomy, competence, and relatedness. Jones and Issroff (2005) discuss the affective and social issues in online learning environments and point out the importance of understanding the nature of students' motivation in participating in online discussions. As noted earlier, attitude toward the class and confidence in technology skills is related to participation in online discussions. Similarly, motivation and self-regulation have also been identified as important to success in online learning (Artino, 2008). These different findings suggest a possible link between motivation and students' attitude toward a class and the confidence they have in their technical skills. Understanding students' motivation aids in identifying issues that influence their motivation and facilitates the exploration of instructional strategies for promoting students' motivation and consequently the quality of online discussions.

Motivation and Self-Determination

Motivation refers to the incentive or energy that drives an individual to take an action (Reeve, 2005). It is a dynamic internal construct that reflects students' emotional and psychological state during a certain time period. Research on motivation suggests that a student's motivation for any given task can range from intrinsic to extrinsic (Deci & Ryan, 1985). When intrinsically motivated, a student takes an action for the fun or challenge (enjoyment) involved in the task rather than seeking external stimuli or rewards, or avoiding pressure or punishment (Lepper, 1988; Ryan & Deci, 2000b). Intrinsic motivation emerges spontaneously from internal tendencies and can motivate behavior even without the aid of extrinsic rewards or environmental controls. It is an important motivator of learning, adaptation, and growth in competencies that characterize human development. Students with high intrinsic motivation might demonstrate greater persistence (Ryan & Deci, 2000a), better ability to cope with failure (Ryan, Connell, & Grolnick, 1992), more positive self-perceptions (Ryan & Connell, 1989), and higher quality task engagement (Ryan & Deci, 2000a). Furthermore, intrinsic motivation can even lead to the experience of flow, which is the peculiar, dynamic, holistic sensation of total involvement with the activity itself (Csikszentmihalyi, 1975).

Davis (1989) suggested that perceived value is one of the major determinants of users' motivation to accept and use a technology. Perceived value is the degree to which a person believes that using a particular information system would enhance their learning or task performance. It directly impacts not only a person's interactivity in online communication, but also his/her motivation toward using an information technology. Research suggests that internalization and integration of values and behavioral regulations are the processes through which a student's motivation orientation can be shifted from extrinsic to intrinsic (Deci, Eghrari, Patrick, & Leone, 1994). Self-Determination Theory (SDT) identifies three innate psychological needs of intrinsic motivation – autonomy, competence, and relatedness (Ryan & Deci, 2000a). In online courses, autonomy should not be confused with social presence or isolation. The need for autonomy refers to the desire individuals have to determine their own behavior and be free to behave of their own volition (Baumeister & Leary, 1995; Reis, 1994). Online courses tend to increase students' sense of autonomy (Wighting, Liu, & Rovai, 2008). The need for competence refers to individuals needing to feel successful in their attempts to understand and master their environment (Harter, 1978; White, 1963). This concept of competence can be extended to not only technically understanding how to participate in an online discussion, but also feeling successful in what is contributed to the discussion. Competence also extends beyond online discussion contributions to competence with the curriculum (Palmer, Holt, & Bray, 2008). The need for relatedness refers to individuals needing to relate to others in ways that reinforce their feelings of emotional security and belonging (deCharms, 1968; Deci, 1975). Drouin (2008) refers to this as students' perceived sense of community (SOC) and that student-student interaction and student satisfaction were both related to students' SOC.

Extension of Previous Research

Xie, DeBacker, and Furgerson (2006) conducted a survey study examining students' motivation and their participation in online discussion activities. They used Self-Determination Theory as the theoretical framework to investigate the relationship between students' intrinsic motivation and their participation in online discussions. They also investigated the trends and change of students' motivation over time. The research sample involved a total of 123 undergraduate students from different sections of a traditional face-to-face lecture-based instructional technology course. The purpose for the inclusion of the online discussions in that course was to extend collaborative learning beyond traditional classrooms. The students participated in online discussions as a normal part of their classes. The results showed that students' participation was related to their intrinsic motivation. Over time, students' intrinsic motivation for participating in online discussions dropped steadily. The interviews indicated that students' motivation was impacted by the instructor's involvement, interaction with peers, discussion topics, course requirements, and system functions.

As noted in the qualitative findings of Xie et al.'s study, the research studies were conducted with students in a face-to-face course, which suggests limitations for their study as to the practical implications of asynchronous online discussions in distance learning settings. Research suggests that students' motivation is especially important for learning activities in online classes as compared to face-to-face settings. Jarvela, Jarvenoja, and Veermans (2008) found that due to the lack of extrinsic regulation in collaborative learning activities, students reported more learning goals and fewer performance goals in the face-to-face setting than students in virtual groups. Rienties et al. (2009) found that academic motivation influences the type of contributions that students make to online interaction discourses. Highly intrinsically motivated students became central and prominent contributors while extrinsically motivated learners had limited responses in cognitive discourses. Yang et al. (2006) found that motivation positively influences social presence among peers in online collaborative learning. In addition, students in online classes have a high-degree of autonomous freedom and can choose their own learning preference, which might be beneficial for learners with intrinsic motivation (Ryan & Deci, 2000b). However, little research has considered the time factor when investigating the relationships between motivation and online discussion participation in a fully delivered online context.

The current study investigated the relationship between students' intrinsic motivation and their behavior in participating in online discussion activities, tracked students' motivation to reveal the pattern of changes in students' motivation during the course of online discussion, and identified factors that impacted students' motivation in online discussion activities. The current study was conducted in an authentic online setting in which students met virtually online and used asynchronous online discussions as an essential communication method to achieve instructional goals through collaborative learning. We believe the findings of the current study may provide valuable guidelines for supporting effective online discussion activities in distance learning classes. The following research questions guided this study:

1. Are there relationships between motivation and students' participation in online discussions, attitude towards the class, and technology confidence?
2. How does students' motivation toward online discussions change over time?
3. What factors impact students' motivation toward online discussions?

Method

A mixed method design including both quantitative and qualitative approaches was adopted in this study. The quantitative approach involved repeated measures to track students' motivation throughout the semester and correlation analyses among variables of intrinsic motivation and online discussion participation. The qualitative approach went in-depth to discover the factors that impacted students' motivation during the course of online discussions. The qualitative data resources included both students' and instructor's interviews.

Participants

The study participants included 20 graduate and 36 undergraduate students (N=56) from four sections of a mixed level online course offered in the College of Education at a large Southeastern University. The sample included 22 males and 34 females. Their age ranged from 20 to 48.

Instructional Context

The title of the course was "Integrating Technology for Meaningful Learning." The course was designed to introduce students to different means of integrating technology into the K-12 classroom curriculum. Participation in online discussions was a significant portion of the class and accounted for 30% of students' final grade in the course. Online discussions were primarily moderated by the students with occasional discussions led by the instructor. All student-moderated discussions were designed to last one week. The instructor followed the institution's academic calendar and when there were shortened weeks due to holiday's the instructor led discussions during those weeks. The first two weeks of the course were built around students becoming familiar with the course structure and an ice-breaker activity. There were ten student-led discussions related to topics selected by the instructor. Students were required to create a WebQuest, which is an inquiry-oriented web-based lesson where most or all the instructional information comes from other websites (www.webquest.org), and moderate a one-week discussion related to the same topic as the WebQuest. The instructor randomly assigned students to the topic for which they would be responsible.

The instructor taught these four sections and followed the same syllabus and instructional methods throughout a 16-week semester. Two sections were in the spring semester and two sections were in the fall semester.

Data Collection

The participants in this study were asked to complete survey questionnaires measuring demographic information, attitude toward the class and the instructor, and intrinsic motivation related to participating in online discussions. In order to track students' motivation, the same motivation questionnaire was given to the participants three times: at the beginning, the mid-point, and the end of the course. A subset of students who showed consistently high or low in their level of motivation was interviewed to discuss the factors related to their motivation in online discussion activities. The instructor of these classes was interviewed at the end of the semester. Students' participation data – the number of messages posted were recorded by the course management system.

The survey questionnaires measured (1) intrinsic motivation using Deci & Ryan's Intrinsic Motivation Inventory (IMI), which was designed based on Self-Determination Theory and was used in several studies of intrinsic motivation and self-regulation (Deci, Eghrari, Patrick, & Leone, 1994; Ryan, Connell, & Plant, 1990; Ryan, Koestner & Deci, 1991). The IMI uses a seven-point Likert scale and was modified to specifically address students' motivation in participating in the online discussions in this study (Xie et al., 2006). The revised IMI measured five variables related to students' intrinsic motivation including (a) eight questions measuring *enjoyment* in online discussion, (b) seven questions measuring *perceived value* of the online discussion, (c) eight questions measuring feelings of *autonomy* in regard to the online discussion, (d) six questions measuring feelings of *competence* in regard to the online discussion, and (e) eight questions measuring feelings of *relatedness* to student peers in the online discussion. According to the IMI scale description, the enjoyment subscale is the self-reported measure of intrinsic motivation; (2) Students' attitude toward the class in general was measured using six Likert style items created for this study; (3) Students' confidence in using a personal computer and the Internet, and the Course Administration Tools, such as WebCT, are self-reported with three Likert style items created for this study.

Results

Means, standard deviations, internal consistency coefficients, and sample items for all scales used in the study can be found in Table 1.

Correlation Analyses

To reveal the relationship among the intrinsic motivation variables, the students' participation variables, the attitude variables and the confidence variables, we conducted a series of correlation analyses. In the correlation matrix (see Table 2), none of the intrinsic motivation variables were significantly correlated with the number of messages posted for time 1. However, for time 2, the enjoyment scores, the value scores, the perceived competence scores, and relatedness scores were significantly correlated with the number of messages posted. For time 3, the enjoyment scores, the value scores, and the perceived

competence scores were significantly correlated with the number of messages posted. Students' attitudes toward the course were significantly related to their intrinsic motivation variables. Technology confidence was significantly correlated with competence over time, and was correlated with value for time 3. No significant correlations were found between students' technology confidence and any other variables of interest. These correlations would be considered modest in magnitude (Cohen, 1977).

Table 1. *Means and Standard Deviation of Variables*

Variable		Mean (SD)	α	Sample Item
Enjoyment	Time1	5.12 (1.22)	.93	If I participate in this online discussion, I will be thinking about how much I enjoy it.
	Time2	4.82 (1.45)		
	Time3	4.64 (1.56)		
Value	Time1	5.66 (1.08)	.91	I believe that participating in this online discussion can be of some value for me.
	Time2	5.61 (1.54)		
	Time3	5.14 (1.61)		
Autonomy	Time1	3.68 (1.46)	.89	I believe I have some choice about participating in this online discussion.
	Time2	3.68 (1.57)		
	Time3	3.48 (1.70)		
Competence	Time1	5.04 (0.96)	.85	I believe I am pretty skilled in the online discussions that allow me to share my knowledge and experiences.
	Time2	5.07 (1.22)		
	Time3	5.11 (1.21)		
Relatedness	Time1	4.73 (1.15)	.90	I'd like a chance to interact with the people in the online discussions more often.
	Time2	4.21 (0.92)		
	Time3	4.06 (1.31)		
Participation		79.39 (50.11)		Total number of messages posted on the online discussion board.
Technology Confidence	Time1	6.12 (0.98)	.90	How confident are you that you can successfully use the Internet to find information and resources?
	Time2	6.52 (0.66)		
	Time3	6.52 (0.83)		
Course Attitude	Time1	5.97 (0.84)	.81	How do you believe you will like the instructor in this class that you are taking?
	Time2	5.78 (1.30)		
	Time3	5.58 (1.07)		

Table 2. *Correlation Matrix*

		Participation	Technology Confidence	Course Attitude
Enjoyment	Time1	r = .214, *p* = .163	r = .294, p = .087	r = .650**, p = .000
	Time2	r = .430*, *p* = .020	r = .073, p = .370	r = .811**, p = .000
	Time3	r = .441*, *p* = .018	r = .180, p = .206	r = .843**, p = .000
Value	Time1	r = .280, *p* = .098	r = .211, p = .167	r = .555**, p = .003
	Time2	r = .538**, *p* = .004	r = .112, p = .305	r = .808**, p = .000
	Time3	r = .585**, *p* = .002	r = .363*, p = .044	r = .832**, p = .000
Autonomy	Time1	r = -.060, *p* = .393	r = .181, p = .204	r = .318, p = .069
	Time2	r = -.308, *p* = .076	r = -.145, p = .254	r = .228, p = .148
	Time3	r = -.109, *p* = .311	r = -.087, p = .347	r = .365*, p = .044
Competence	Time1	r = .304, *p* = .079	r = .611**, p = .001	r = .472*, p = .011
	Time2	r = .611**, *p* = .001	r = .424*, p = .022	r = .643**, p = .001
	Time3	r = .682**, *p* = .000	r = .465*, p = .013	r = .833**, p = .000
Relatedness	Time1	r = .009, *p* = .483	r = .115, p = .301	r = .387*, p = .034
	Time2	r = .426*, *p* = .021	r = -.088, p = .345	r = .552**, p = .003
	Time3	r = .320, *p* = .068	r = .260, p = .115	r = .691**, p = .000

* Correlation is significant at the 0.05 level.
** Correlation is significant at the 0.01 level.

Changes in Intrinsic Motivation

Five repeated measures MANOVAs were conducted on the five intrinsic motivation sub-scores in order to examine the changes in students' intrinsic motivation variables. The results for enjoyment indicated no significant changes over time. Means indicated that enjoyment scores remained moderately high throughout the semester (*M* = 5.12 at time 1, *M* = 4.82 at time 2, and *M* = 4.64 at time 3). The results for autonomy indicated no significant changes over time. Means indicated that autonomy scores remained moderately low through the semester (*M* = 3.68 at time 1, *M* = 3.68 at time 2, and *M* = 3.48 at time 3). The results for perceived competence indicated no significant changes over time. Means indicated that competence scores remained moderately high through the semester (*M* = 5.04 at time 1, *M* = 5.07 at time 2, and *M* = 5.11 at time 3). The results for value indicated a significant difference across time [Wilk's Lambda = .66; $F(2, 54) = 5.45$; $p < .05$]. Means indicated value scores fell steadily across time (*M* = 5.66 at time 1, *M* = 5.61 at time 2, and *M* = 5.14 at time 3). A follow-up ANOVA revealed value scores between time 2 and time 3 were significantly different [$F(1, 55) = 11.03$; $p < .01$], but no significant difference was revealed on value scores between time 1 and time 2. The results for relatedness indicated a significant difference across time [Wilk's Lambda = .68; $F(2, 54) = 4.94$; $p < .05$]. Means indicated value scores fell steadily across time (*M* = 4.73 at time 1, *M* = 4.21 at time 2, and *M* = 4.06 at time 3). A follow-up ANOVA revealed relatedness scores between time 1 and time 2 were significantly different [$F(1, 55) = 11.03$; $p < .01$], but no significant difference was revealed on relatedness scores between time 2 and time 3. Results are illustrated in Figure 1.
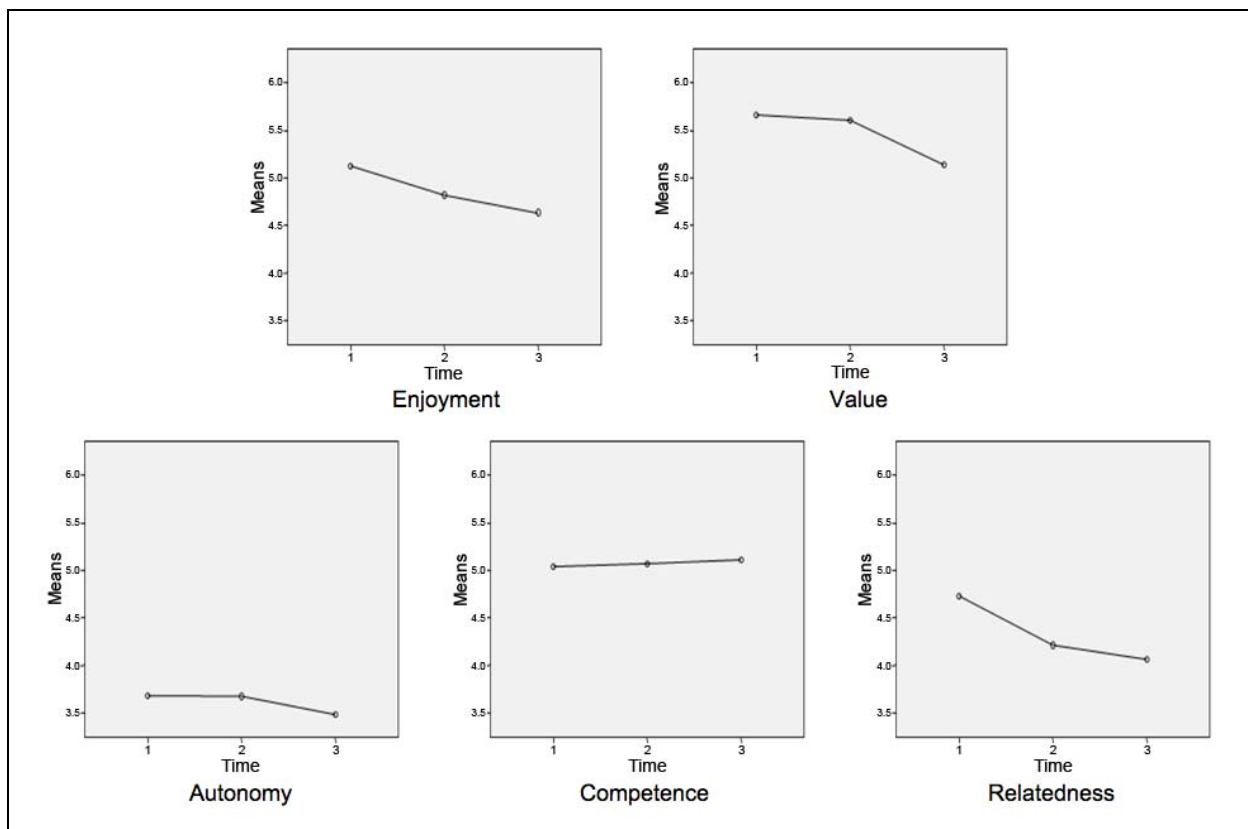
Figure 1. Changes in Enjoyment, Value, Autonomy, Competence, and Relatedness

Instructor's Interview

The instructor of these classes expressed a very positive attitude toward the inclusion of the online discussion activities in his class. He believed that the online discussions gave the students opportunities to share experiences and added "a dimension to the topics that the book doesn't cover." He thought the online discussion gave the instructor a sense of how well his students understood the content. He also believed that the online discussion could benefit his students by bringing some reality to the topics being discussed. He mentioned, "The class was about integrating technology for meaningful learning, but some of the students had not been into the classroom yet, so learning from other peoples' experiences brings some reality to those students."

The instructor used qualitative requirements (how well they respond to other's discussion postings) rather than quantitative requirements (number of posts), because he believed the quantitative requirements would prompt students to post messages just for the sake of posting. During the semester, he employed many motivational support strategies to encourage students' participation including (1) posting examples from past classes so that his students could get an idea of what the expectations were, (2) making sure students understand the course requirements and going through the syllabus and calendar with them, (3) encouraging social interactions among students (e.g., ice-breaker activities), (4) breaking students into smaller groups for discussion (e.g., two groups of 10), (5) periodically emailing students to encourage them to participate in the online discussions, and (6) continuously participating in the online discussion (e.g., he checked online discussion board at least twice a day). In addition, he tried to maintain a balance in relation to his participation in the discussions. He tried to participate in a manner where he asked more questions in order to guide his students to think more critically about the topics being discussed. He wanted to participate to the point that the discussions continued. But he mentioned that it was hard, because sometimes when he participated in the discussions and answered questions addressed to him the discussion would end prematurely.

The instructor also expressed that the online discussion activities added a great deal to his teaching workload. He strived to check the online discussion board at least twice a day and in the classes used in this study he estimated that he had read over 2000 messages per class, and had posted over 500 messages throughout the semester. He mentioned that he was interested in the dynamics of online discussions and without that interest he wasn't sure how much he would enjoy teaching online. "… I would really hate it. You can sit there at your computer all day and just let the online discussion take up your life. And if you are not careful, you'll let that (the discussion) dominate you." This is similar to what Siemens (2009) suggested that the instructor cannot read everything in Massive Open Online Courses, such as, Connectivism and Connective Knowledge courses – CCK08 and CCK09 (Siemens, 2009).

Students' Interviews

Ten students agreed to have interviews with the researchers. Among them, there were 7 students who showed a consistently high or moderately high level of motivation (intrinsic motivation >= 5.0 at three time periods) in their self-reports, and 3 students who showed a consistently low or moderately low level of motivation (intrinsic motivation <= 3.0 at three time periods).

Students with high motivation reflected: First, they were very clear of the requirements and assignments for the online discussion activities in their class. Second, they liked the opportunity to learn from and with their peers. Students appeared to appreciate the different viewpoints and experiences shared in the online discussions. "It was easy and enjoyable because I was learning not just from myself, but from the other entries that everyone else was putting on there." "It is a really good experience because you're seeing things from different points of view which brings the whole picture." When students were in the role of discussion moderators, they identified the participation of their peers as motivating. "Just the fact that they participated in my discussion was inspiring enough to me because they were intrigued and interested enough to post their comments. It was motivating to me the way they participated." Third, they liked the opportunity to know each other in their distance class. "I do feel like we're kind of getting to know each other more even though we don't see each other." In addition, they mentioned that having discussion participation as a component of their grade was an important factor that motivated them to participate, but they stressed that being graded was not the only important factor for their motivation. They also cited difficulties with time constraints, however, it seems they developed time management skills over time. One student mentioned, "At the beginning, it was just learning how to manage my time; that was the biggest thing." They liked the instructor and the topics covered in the class and appreciated the instructor's presence in the online discussions.

Students with low motivation reflected: First, they didn't see the value of online discussion. "I don't see what the purpose of it is honestly." "I really don't feel like I'm getting anything out of the discussion. I can listen to what everybody else has to say, but I still have to refer back to the book for a lot of things." "I don't see any benefits of this online discussion to me." They also felt they were forced to participate in the online discussion activity because it was a component of their grade. "I felt I have to do it because I want to get a good score in this class." Thirdly, they were confused about the course requirements and assignments. "I really didn't read through the syllabus like I should. I am sorry!" Furthermore, they felt they didn't have time for the discussions. "I just really need to manage my time more because if I could manage my time more, I could do a whole lot better." "I have other things on my mind trying to do, I am not interested in the discussion."

Discussion

The purpose of this study was to investigate the relationship between students' intrinsic motivation and their participation in online discussions. The results indicated there was no relationship between students' intrinsic motivation and their participation in online discussions at the initial stage of the classes. However, the relationship between motivation and participation became stronger and significant as the classes progressed over time. It seems to indicate that students' motivation was related to their online participation, but the relationships need time in order to be established. Research suggests that many of the learning activities prescribed in schools are not designed to be intrinsically interesting to particular students (Csikszentmihalyi & Larson, 1984; Csikszentmihalyi & Nakamura, 1989). The results of this study suggest that as online classes progress, students start to perceive discussion activities as enjoyable and valuable, they tend to participate in online discussions more frequently and have a

positive attitude related to the course. These results support the SDT framework (Deci & Ryan, 1985) that there are higher levels of engagement amongst those who are intrinsically motivated by the task.

An interesting caveat to this was that the perceived value of the discussions significantly dropped between the mid-point of the course and the end of the course. Since value was correlated with level of participation and with attitude toward the course, the drop in perceived value was an interesting finding. The perceived drop in value would imply that there was a corresponding drop in the level of participation. The drop in value also would imply a decrease in attitude toward the course. Possible explanations for the decline in perceived value might be attributable to the design of the course. The instructor believed that a consistent course structure and format would allow students to increase their comfort level with the course. Therefore, he designed this course with similar format of class activities, assignments, and projects throughout the semester, instead of having final projects and exams at the end of semester. This consistent structure might have eased students' feeling of heavy workload at the end of the semester, but on the other hand it also contributed to potential boredom with the course design. It is a dichotomy that would be an interesting topic for further research. The relationship and interaction between the factors of perceived value, participation, and attitude need to be studied further.

Competence also revealed a strong correlation with participation and attitude toward the course. Competence was also moderately to strongly correlated with technology confidence and course attitude. This correlation suggests that when students feel competent in their ability to participate in the online discussions they also have confidence in their technological abilities, have more positive attitudes about the course, and tend to be more active participants in the online discussions.

The results indicated the correlation between perceived relatedness with peers and their participation was only moderately significant at the mid-point of the course. This appears to be consistent with research by Cheung, Hew, and Ng (2008) in which they found personal relationships online were a motivator for student participation in the online discussions. Also worthy of note, relatedness was weakly to strongly associated with course attitude. As the semester progressed the relationship grew stronger between students' perceptions of relatedness to their peers and their attitude toward the course. It was also intriguing to find that the perception of relatedness significantly dropped between time one and two while the correlation between relatedness and course attitude grew stronger (r^2 = .14, r^2 = .30 respectively). The change in the amount of variance in the course attitude that is associated with relatedness was also linked to these results. One possible explanation to the change in relatedness from the beginning to the middle of the class might be associated with how the instructor began the class. The instructor used an introduction activity that involved the whole class and there was a great deal of participation. When the discussions began for the course content, the instructor randomly divided the class into smaller groups. It might be that students liked the larger group size, or identified with peers during the introduction activity that weren't in their initial discussion group.

The moderately low perceived autonomy indicated that students did not believe their participation in the discussions was self-determined, instead, there was some extrinsic drive introduced to the students. The interview data indicated that the course grade associated with online discussion activities was one of the significant extrinsic motivators for students independent of whether they had high or low motivation. This course grade requirement might have diminished their perceived autonomy. However, the correlation matrix specified the perceived autonomy was not significantly correlated with online discussion participation, technology confidence, or course attitude variables. Therefore, the extrinsic drive introduced by the course grade might have been a good trade-off. On one hand, it might have diminished students' autonomy which might have impacted their intrinsic motivation. On the other hand, it might have initiated students' motivation to participate in the discussion activities.

This study found that students' perceived enjoyment did not significantly change over time and remained moderate to high (M = 5.12 at time 1, M = 4.82 at time 2, and M = 4.64 at time 3). Even though students' perceived value dropped significantly from the middle point of the semester to the end of the semester, as means indicated, students perceived value remained relatively high (M = 5.66 at time 1, M = 5.61 at time 2, and M = 5.14 at time 3). Overall, students in these two classes perceived the online discussion activities as enjoyable and valuable. These findings differ from the results of Xie, et al.'s study (2006) where they found that both students' perceived enjoyment in and perceived value for the online discussion activities dropped steadily. Furthermore, in their study, students' perceived enjoyment and value were reported in a median range over time. It seems that students may feel more enjoyable and

valuable in online discussion activities in authentic distance learning classes comparing to the online discussion activities added to face-to-face classes. The interview data from high motivation students also reflected that they believed the discussion activities were enjoyable and valuable because they had a chance to learn from each other and get to know each other and form a learning community through the online discussions.

The instructor of these classes had previous experience teaching online and had a clear understanding of the nature of online discussions. He had a positive attitude toward the inclusion of the online discussions and applied various strategies to promote effective online discussions. However, there were still students who perceived the online discussion activities were not enjoyable and did not believe they added any contributing value to their learning. Compared to the high-motivation students, the low-motivation students revealed that they struggled to understand the learning activities and requirements in their classes, and had difficulty managing their time effectively and efficiently.

Implications

These findings suggest that students' perceptions of enjoyment, value, competence, and relatedness are related to students' participation in and attitude towards the course. Different effects on these three psychological needs will result in different levels of intrinsic motivation. The groundwork for facilitating motivational internalization is supporting students in obtaining a sense of satisfaction in their need for autonomy, competence, and relatedness. The aspect of time (beginning, mid-point, end of course) was relevant in the areas of value and relatedness. Further research into the role time plays and more detailed characteristics of online discussions over time will provide more insight into the interaction of these variables.

The importance of students' perception of the enjoyment, value, competence, and relatedness motivation factors and these factors relationship to participation and course attitude were evident in this study. In designing and delivering online courses that include online discussions, the challenge to instructors seems to be in obtaining and sustaining the levels of enjoyment, value, and relatedness. The results indicated declining student perceptions over time. Future research should focus on identifying characteristics of online discussions related to enjoyment, value, and relatedness. One characteristic that appeared to contribute to the value were the interactions with peers. However, while the perceived value of the discussions was high, there was a decline in the perceived value over time. The decline could be related to the fact that the instructor used the same format for all student led discussions and that over time the uniqueness of the discussions declined with time. An examination of online discussions using content analysis to examine student postings that are related to the motivational factors of enjoyment, value, and relatedness would further aid in identifying the characteristics that relate to perceived value. The use of content analysis might also provide insight into the decline in perceived value and enjoyment over time. It is anticipated that future research into these specific discussion characteristics will give researchers and instructors further insight into fostering online discussions that are valued by students. The strengthening relationship between these motivational factors and student participation and course attitude, suggests that not only should characteristics of online discussions be identified, but also course design and teaching techniques related to participation in online discussions. Exploration of teaching techniques related to achieving and sustaining these motivational factors will be an important addition to this area of research.

For online instructors this study provides insight and guidance for online discussions. While linking online discussions with grades was seen as an extrinsic motivator it also appears that it served as a good means of initiating discussion participation. The aspects of value and enjoyment are also important and may be similar to Dennen's (2005) findings that discussions should be need-based and relevant. Since perceived competence was found to be related to participation, providing opportunities for students to have success with the online discussions and online environment early in the course should enhance students' perceived level of competence. Online discussions continue to be a learning tool used in online classes and the insights provided in this study will contribute to the knowledge base of factors related to student participation.

Limitations of Study

While the results reveal significant findings and draw important implications to the teaching and learning practice in distance learning, this study has several limitations and requires further research. One

limitation is that the research samples of this study were from an instructional technology course where the course content of "technology integration for learning and teaching" might have had some influence on students' motivation and their participation rate. Also the instructor of these classes was specifically interested in the dynamics of online discussions, which might have helped sustain students' motivation and online engagement. Future research should examine students' motivation and their online engagement in different instructional contexts in order to draw broader implications for distance education. Secondly, this study examined only one aspect of student participation in asynchronous online discussions, namely the participation rate. Future research should also examine how motivation affects student interaction discourse by applying analytical techniques such as content analysis, social network analysis, etc. Future research should also examine and compare factors that influence student involvement over the course of online learning.

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