ELSEVIER

Internet and Higher Education 9 (2006) 277–286

THE INTERNET AND HIGHER EDUCATION

Exploring the relationships between students' academic motivation and social ability in online learning environments

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Accepted 23 August 2006

Abstract

This research explicates the construct of social ability and describes the relationship between students' academic motivation and social ability in online learning environments. Findings reveal perceived peers social presence, perceived written communication skills, perceived instructor social presence, comfort with sharing personal information, and social navigation as the five factors that define social ability. In addition, the multivariate multiple regression analyses indicate that different motivational constructs vary in their relationships with the multiple social ability factors. Intrinsic goal orientation is related to perceived peers social presence. Self-efficacy explains the variance of perceived instructor social presence and comfort with sharing personal information. Task value is associated with social navigation and both perceived peers and instructor social presence. Additional studies are needed to replicate the current findings and further explicate social ability in online learning, to continue to improve the social ability instrument, and to examine the value of other academic motivation beliefs in predicting social ability as well as that of social ability in predicting learning outcomes.

Keywords: Social ability; Social presence; Social navigation; Privacy; Academic motivation; Intrinsic goal orientation; Self-efficacy; Task value; Online social interaction

1. Introduction

Online learning is rapidly growing in higher education. The 2005 survey of online learning with over 1000 colleges and universities in the United States, conducted by the Alfred P. Sloan Foundation, shows that more than 2.35 million students took one or more online courses in 2004 (Allen & Seaman, 2005). Research is needed to understand students' online learning experience and their ability to interact and learn in online systems in order to improve the quality of online education.

Several studies demonstrate that online students perceive that they learn at lower levels than students in face-to-face learning environments even when there are no significant differences in the actual learning outcomes of these two

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doi:10.1016/j.iheduc.2006.08.002

groups of students (e.g. Neuhauser, 2002; Ocker & Yaverbaum, 1999). Rovai and Barnum (2003) argue that the level of student interaction and participation is important to their perceptions of learning. They found that graduate students reported higher levels of perceived learning when they posted more messages to the discussion board. This finding is consistent with previous studies (Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Picciano, 2002; Swan, 2001), that found positive relationships among interaction, learning satisfaction, and perceived learning.

Social theories of learning (e.g. Vygotsky, 1978; Wenger, 1998) provide a conceptual framework for how interaction is related to learning. According to social theories of learning people learn through actively interacting with others. Vygotsky (1978) argues that a learner's cognitive development is highly associated with amount of interaction with knowledgeable others. Wenger (1998) presents a framework to show that learning occurs through actively participating in a community of practice. As prior research and these conceptual frameworks show learning, even online learning, is a social activity and that the social nature of learning is important to the learning experience and learning outcome. Thus, the social aspect of online learning should be investigated.

As an effort to understand the social nature of online learning, Laffey, Lin, and Lin (2006) investigated online students' social ability, defined as "the person's capacity to associate with fellows and to use the members, resources and tools of the social context to achieve something of value" (p.1), as an aspect of the students' experience and perception of social interaction. They explicated the construct by using a review of the literature of online social interaction and online cooperative work to develop an instrument to measure social ability. Using factor analysis, they found that social presence, social navigation, and social connectedness are important factors explaining social interaction in online learning environments. In the present study, the researchers expanded the original study by Laffey et al. (2006) by adding more constructs found in extant literature, such as privacy and written communication skills, in order to search for more complete explanations of social ability.

In addition, the researchers explored the relationships of students' academic motivation-in particular, intrinsic motivation, self-efficacy, and task value—with social ability. Since motivation is a critical factor influencing the cognitive learning process, it is assumed that a highly motivated individual may deliberately interact with other participants to seek out resources and information and better utilize tools to connect with others in online contexts. However, little is understood about the relationship between motivation and social ability in online contexts.

2. Background

2.1. Social ability

Social ability explains how learners experience and perceive social interaction while they make relations with other individuals, use social practice tools, and undertake tasks in online learning environments (Laffey et al., 2006). In their initial study, Laffey et al. (2006) explicated the construct of social ability by developing an instrument to measure social ability, and they found that social navigation, social presence, and social connectedness are three important factors describing social ability in online learning environments.

Social navigation refers to "a particular phenomenon, in which a user's navigation through an information space was primarily guided and structured by the activities of others within that space" (Dourish, 1999, p.18). For example, when students participate in online discussions, they recognize hot issues by looking at the number of threaded postings under the topic headings. Defining social presence as "a measure of the feelings of community that a learner experiences in an online environment" (Tu and McIsaac, 2002, p.131), Tu (2002b) developed a questionnaire that measures an individual's perception of the degree of social presence through computer-mediated communication. Picciano (2002) found positive relationships between students' perceived social presence and their actual written assignment scores ($r=-.55$, $p<.05$) as well as between their perceived social presence and their perceived learning experience in an online course ($r=.67$, $p<.05$). Social connectedness represents social ties among people and the value they perceive in being connected (Laffey et al., 2006; Resnick, 2002).

In addition to social navigation, social presence, and social connectedness, a review of the social interaction literature showed that students' perception of online privacy (Tu, 2002a,c; Weisband & Reinig, 1995) and their own communication skills (Lapadat, 2002) are potentially important aspects of students' social ability in online learning environments. Tu (2002c) defines feelings of privacy as online students' psychological, mental, cultural, and conditional perception of privacy. For example, students may perceive that an online discussion board is more public and less private than e-mail (Tu and McIsaac, 2002), and therefore feel uncomfortable in sharing some types of information.

Written communication is one of the most common styles of online interaction (Lapadat, 2002; Tu, 2001). According to Lapadat (2002), in asynchronous communication, online students feel the presence of others through their text traces. For example, online students know who leaves a message and what others think about the topic by reading others' writings. This form of communication style requires students to have a certain degree of typing, reading, and writing skill (Tu, 2001). Therefore, students who lack written communication skills are hampered in effectively communicating with others. Tu (2001) found that Chinese students who use English as a second language feel the necessity of improving typing and writing English when they communicate with others via computer-mediated communication systems. Lapadat (2002) also pointed out that students may selectively choose or avoid messages based on the quality of writing.

2.2. Motivation

Motivation is generally defined as "the process whereby goal-directed activity is instigated and sustained" (Pintrich and Schunk, p.5). Among several motivational constructs, goal orientation, self-efficacy, and task value have consistently shown strong relations to achievement-related behaviors in learning contexts.

Goal orientation theories explain why people engage in tasks and how they approach the tasks. Goal orientations theorists have generally categorized goal orientations as intrinsic and extrinsic. Students holding intrinsic goals tend to exert more effort and are more persistent at finishing difficult tasks than those holding extrinsic goals (Ames & Archer, 1988; Merritte, 1999; Nicholls, 1984; Pintrich & Schunk, 2002). Greene and Miller (1996) found that college students holding intrinsic goals were more likely to use deep cognitive strategies and self-regulatory strategies.

Bandura (1997) defines self-efficacy as an individual's conviction about his/her own capabilities "to organize and execute the courses of action required to manage prospective situations" (p.2). For example, when people judge themselves highly capable of doing a given task, they actively engage in new tasks and persist at the tasks in the face of difficulty more than those who judge themselves less capable (Bandura, 1997; Pintrich & Schunk, 2002). If we apply this concept to online educational settings, students having low self-efficacy may be reluctant to actively engage in the social interaction that is necessary for completing tasks successfully. Lee (2002) found that college students with strong academic self-efficacy performed better than others with lower self-efficacy in a Web-based course.

Task value refers to an individual's beliefs about the various reasons for engaging in a task (Pintrich & Schunk, 2002). Bures, Amundsen, and Abrami (1998) found that students holding higher outcome expectancies and task values tended to be more satisfied with their computer conferencing learning experience than those holding lower expectancy and task value beliefs. Lee (2002) also found that students valuing the task were more likely to be satisfied with their online learning experience.

2.3. Purpose of the present study

The purposes of this study are twofold: first, to extend the research of Laffey et al. (2006) to further explicate the factors explaining students' social ability in online learning environments; second, to explore the relationships between students' motivation and social ability so as to better understand their interrelationship. More specifically, the research questions are as follows:

1. In what ways do students perceive their social ability and experience the social nature of online learning?
2. To what extent and in what ways does students' academic motivation relate to their social ability in online learning environments?

3. Method

3.1. Participants

Data were collected from online courses offered in the College of Education in a mid-west university during the winter semester of 2005. Of the 250 students enrolled in the eleven courses surveyed, a sample of 133 volunteered and completed the Online Experience Student Survey over the Internet. After initial data screening, 8 cases were eliminated due to missing data; thus, the final sample was 125 cases. Table 1 reports the demographic information for 123 cases (2 cases did not provide detail demographic information).

Table 1
Demographic information for 123 cases

Demographic information		Number of participants	Percentage (%)	Total
Gender	Male	40	32.5	123
	Female	83	67.5	
Language	Native speaker	113	91.9	123
	Non-native speaker	10	8.1	
Academic status	Undergraduate	26	21.1	123
	Graduate	97	78.9	
Pervious online courses	0–1 courses	39	31.7	123
	2–5 courses	33	26.8	
	>6 courses	51	41.5	
Hours login (weekly)	<5 h	53	43.1	123
	6–10 h	40	32.5	
	>10 h	29	23.6	

3.2. Context

All the surveyed courses were delivered entirely over the Internet using course management systems, such as Blackboard and WebCT, and had no required face-to-face sessions. The course structures were similar: generally, students were given a set of tasks and they worked interactively to create artifacts to complete an assignment.

3.3. Measures

3.3.1. Motivation

In this study, the researchers operationalized academic motivation as intrinsic goal orientation, self-efficacy, and task value. To measure those constructs, 4 items on intrinsic goal orientation, 8 items on self-efficacy, and 6 items on task value from the Motivated Strategies for Learning Questionnaire (MSLQ) were adapted. MSLQ is the most well-known and widely used motivation questionnaire for educational contexts (Duncan & McKeachie, 2005). For use in this study, the scale was modified so that the items could be specific to learning in online courses. The final scale consisted of 18 Likert items rated on a seven-point scale with 1 labeled "strongly disagree" and 7 labeled "strongly agree". The Cronbach α reliability estimates from our data were .84 for the intrinsic goal orientation subscale, .93 for the self-efficacy subscale, and .93 for the task value subscale.

3.3.2. Social ability

Laffey et al. (2006) developed the Social Ability Instrument comprising 20 items aimed at measuring students' experience and perception of social interaction in online learning environments. They reported that three factors, social navigation (6 items, $\alpha = .92$), co-presence (4 items, $\alpha = .84$), and social connectedness (2 items, $\alpha = .95$) accounted for 65.69% of the variance in the measure. Twenty-two items were added to expand the instrument to 42 items so as to explore additional issues including distinguishing between instructor presence and presence of other students and the new issues of privacy (Tu, 2002a,b,c) and written communication skills (Lapadat, 2002; Tu, 2001) which were suggested by the extant literature and observation by researchers, who are experienced online instructors.

3.4. Procedure

3.4.1. Data collection

The email inviting participation in the present study were sent to the instructors of online courses offered by the College of Education. Eleven instructors responded to invitation so that the data were collected in 11 online courses. After acquiring instructors' consent, the researchers sent students recruiting email with consent forms and the URL of the Online Experience Student Survey in the middle of the semester. Participants filled out the survey over the Internet at their convenience. After they submitted the survey, the data were saved in the secured database. Students' identifications were deleted to protect their confidentiality before analyzing the data.

3.4.2. Data analysis

Research question 1 was addressed through an exploratory factor analysis. Question 2 was addressed with multivariate multiple regression by using mean scores of 3 motivational beliefs as independent variables and factor scores of 5 social ability factors as dependent variables.

4. Results

4.1. Social ability and factors

Prior to analysis, 42 social ability items were examined through a series of SPSS programs for accuracy of data input and the assumptions of multivariate analysis. Seven negative written social ability items were also reversely scored.

Table 2
Factor loadings of social ability instrument items

Items	Factor loading
Factor 1: Perceived peers social presence	
1. I feel connected to other students in this course	.826
2. My interactions with other students are sociable and friendly	.821
3. My online interactions with other students seem personal	.813
4. In my interactions with other students I am able to be myself and show what kind of classmate I really am	.785
5. I feel like I am a member of a group during the course activities	.727
6. I feel comfortable expressing my feelings to other students	.702
7. When I log on I am usually interested in seeing what other students are doing or have done	.605
8. I trust the other students in this course to help me if I need it	.557
9. The actions of other students in the course are easily visible in our online system	.552
10. When I see that other students are confused I offer help	.458
Factor 2: Perceived written communication skills	
11. I am concerned that my writing ability limits how well other students can get to know me	.873
12. I am concerned that my writing ability limits how well my instructor can get to know me	.827
13. I am concerned that my writing ability limits how effective I can be in this course	.702
Factor 3: Perceived instructor social presence	
14. My interactions with the instructor are sociable and friendly	.878
15. I feel comfortable expressing my feelings to the instructor	.826
16. My online interactions with the instructor seem personal	.745
17. The actions of the instructor in the course are easily visible in our online system	.728
18. In my interactions with the instructor I am able to be myself and show what kind of student I am really am	.681
19. I trust the instructor in this course to help me if I need it	.631
20. When I log on I am usually interested in seeing what the instructor is doing or has done	.596
21. I feel connected to the instructor in this course	.567
Factor 4: Comfort with sharing personal information	
22. I feel uncomfortable with the amount of information about myself that I had to share with other students in this course	.764
23. I feel uncomfortable with the amount of information about myself that I had to share with the instructor in this course	.983
24. I feel uncomfortable interacting with others in the course because these interactions are recorded	.637
Factor 5: Social navigation	
25. Knowing what other students in the course have done helps me know what to do	.777
26. Knowing that other students in the course are aware of my work usually influences how hard I work and the quality of my work	.686
27. The actions of other students in the course influence the quality of my work (such as trying to write better messages or working more carefully)	.664
28. Interacting with the instructor helps me accomplish assignments with higher quality than if I were working alone	.578
29. Interacting with other students helps me accomplish assignments with higher quality than if I were working alone	.571
30. The actions of the instructor in the course influences the quality of my work (such as trying to write better messages or working more carefully)	.487

Note. F1—Perceived peers social presence, F2—Perceived written communication skills, F3—Perceived instructor social presence, F4—Comfort with sharing personal information, F5—Social navigation.

Table 3
Descriptive statistics of social ability factors and motivation beliefs and items reliability

Constructs	Overall		Reliability (# of items)
	M	SD	
Social ability	5.48	.79	.92 (30)
Perceived peers social presence	5.21	1.07	.93 (10)
Perceived written communication skills	5.41	1.76	.90 (3)
Perceived instructor social presence	5.86	.91	.91 (8)
Comfort with sharing personal information	5.61	1.58	.83 (3)
Social navigation	5.38	1.10	.88 (6)
Motivation	5.92	.71	.92 (18)
Intrinsic goal orientation	5.53	.99	.83 (4)
Self-efficacy	6.06	.77	.92 (8)
Task value	6.12	.94	.94 (6)

Note. $N=104$.

Sixteen cases with extremely low z scores (<-3.29) on the social ability items were found to be univariate outliers; two other cases were identified through Mahalanobis distance, $\chi^2(42)=76.09$, as multivariate outliers with $p<.001$. All 18 outliers were deleted, leaving 107 cases for analysis.

Normality was checked for the skewness and kurtosis of the 42 items. Although many of the items were negatively skewed (between −3 and −7.5), no deletion of items or transformations of them were performed. The kurtosis was found to be satisfactory (<3) except for item 42 whose kurtosis was about 5. All the items were retained. Multicollinearity was assessed using Tolerance with the cutoff value of .10. One social ability item with extreme multicollinearity was deleted, leaving 41 variables for the exploratory factor analysis.

In order to understand how students perceive their social ability and experience the social nature of online learning, 41 items from the social ability instrument were extracted using principle axis factoring with oblique rotation. Due to the small sample size and violation of the normality assumption, maximum likelihood extraction was not used. Oblique rotation was used because some correlations among factors were expected. Even though when the factors are truly uncorrelated, orthogonal and oblique rotation produce nearly identical results (Costello & Osborn, 2005).

The exploratory factor analysis resulted in 5 factors accounting for 34.05%, 11.45%, 8.16%, 4.43%, and 3.76% of the variance respectively, and 61.86% of total variance. Thirty items, whose factor loadings were greater than 0.4 and cross-loading differences were larger than .15, were retained. Table 2 shows the five factors characterized as perceived peers social presence, perceived written communication skills, perceived instructor social presence, comfort with sharing personal information, and social navigation, with Cronbach's coefficient alpha respectively of .93, .90, .91, .84, and .88.

4.2. Effects of motivation on social ability

Prior to regression analysis, the mean scores from the intrinsic goal orientation, self-efficacy, and task value items and factor scores of five social ability factors were examined for both univariate and multivariate outliers. The deletion

Table 4
Intercorrelations between social ability factors and motivation beliefs

Variables	SA	F1	F2	F3	F4	F5	MB	IGO	SE	TV
Social ability (SA)	–									
Perceived peers social presence (F1)	.895**	–								
Perceived written communication skills (F2)	.453**	.272v	–							
Perceived instructor social presence (F3)	.790**	.550**	.153	–						
Comfort with sharing personal information (F4)	.291**	.032	.369**	.063	–					
Social navigation (F5)	.703**	.572**	−.072	.628**	−.105	–				
Motivation beliefs (MB)	.575**	.520**	.163	.541**	.041	.432**	–			
Intrinsic goal orientation (IGO)	.435**	.447**	.177	.375**	−.085	.320**	.821**	–		
Self-efficacy (SE)	.447**	.385**	.135	.400**	.189	.272**	.705**	.365**	–	
Task value (TV)	.474**	.389**	.073	.499**	.028	.417**	.818**	.502**	.390**	–

Note. ** $p<.05$.

Table 5
Summary of multivariate multiple regression for motivation beliefs explaining social ability

Variables	*B*	SEB	*β*	t	Sig. (*t*-tailed)
Perceived peers social presence					
Intrinsic goal orientation	.305	.097	.308	3.131	.002**
Self-efficacy	.191	.119	.152	1.614	.110
Task value	.230	.110	.210	2.091	.039**
Perceived written communication skills					
Intrinsic goal orientation	.158	.114	.159	1.393	.166
Self-efficacy	.102	.139	.080	.734	.464
Task value	−.033	.129	−.030	−.259	.796
Perceived instructor social presence					
Intrinsic goal orientation	.110	.096	.111	1.153	.252
Self-efficacy	.246	.116	.196	2.117	.037**
Task value	.420	.108	.382	3.888	.000***
Comfort with sharing personal information					
Intrinsic goal orientation	−.024	.114	−.201	−1.787	.077
Self-efficacy	.283	.139	.221	2.040	.044**
Task value	.016	.129	.015	.127	.899
Social navigation					
Intrinsic goal orientation	.138	.098	.143	1.416	.160
Self-efficacy	.091	.119	.074	.762	.448
Task value	.392	.110	.366	3.547	.001***

Note. $N=104$. For perceived peers social presence, $R^2=.261$; for perceived written communication skills, $R^2=.006$; for perceived instructor social presence, $R^2=.291$; for comfort with sharing personal information, $R^2=.029$; for social navigation, $R^2=.216$. **$p<.05$.

of three cases with univariate outliers of the motivation beliefs items left 104 cases for the following analysis. Table 3 shows the means and standard deviations as well as Cronbach's coefficient alpha for the scale reliability of the social ability factors and the motivation beliefs.

Table 4 presents a correlation matrix of 5 social ability factors and 3 motivation beliefs. Students' intrinsic goal orientation, self-efficacy, and task value beliefs have significantly positive correlations with their perceived peers and instructor social presence as well as social navigation. Students' comfort with sharing personal information has relatively low and not significant associations with the other social ability factors except for the factor of their perceived written communication skills. The results show that the factor of comfort with sharing personal information seems to have weaker associations with the rest of the factors than those among the other 4 factors.

Table 5 shows how much variance of the social ability factors is explained by each motivation belief construct. Intrinsic goal orientation, self-efficacy, and task value collectively account for 26.1%, 0.6%, 29.1%, 2.9%, and 21.6% respectively of the variance of perceived peers social presence, perceived written communication skills, perceived instructor social presence, comfort with sharing personal information, and social navigation. Intrinsic goal orientation explains significantly the variance of perceived peers' social presence. Self-efficacy explains significantly the variance of perceived instructor social presence and comfort with sharing personal information. Task value explains significantly the variance of both perceived peers and instructor social presence, and social navigation.

5. Discussions and conclusions

Table 6 displays the comparison of dimensions identified in the current and previous study (Laffey et al., 2006). Laffey et al. (2006) reported social presence, social connectedness and social navigation as three factors of social ability. In this study, the researchers found five factors of social ability labeled as perceived peers social presence, perceived written communication skills, perceived instructor social presence, comfort with sharing personal information, and social navigation. The social presence and social connectedness items used in Laffey et al. (2006) study did not distinguish students' perception toward their peers from that toward the instructor. Although they found

Table 6
Comparison between social ability dimensions in two studies

	Laffey et al. (2006)	The present study
Dimensions	F1. Social presence F3. Social connectedness	F1. Perceived peers social presence
		F2. Perceived written communication skills
	F1. Social presence	F3. Perceived instructor social presence
		F4. Comfort with sharing personal information
	F2. Social navigation	F5. Social navigation

the predictive value of co-presence to learning satisfaction, it was not identified whether that resulted from perceived social presence with peers, or with the instructor, or with both (Laffey et al., 2006). In order to clearly understand the source of social presence, the researchers differentiated between peers and instructors when we rewrote the social presence and connectedness items, and then these two factors, which were two distinct factors in the previous study, were loaded on social presence in this present study. In addition, perceived peers social presence and perceived instructor social presence were newly loaded as two distinct factors. The current findings show that social presence and social connectedness may be two facets of one dimension rather than distinctive dimensions. Also, the new findings show that students' perceived peers presence is different from students' perceived instructor presence.

In addition to perceived peers social presence and perceived instructor presence, the researchers found three more factors explaining students' social ability in online learning environments; perceived written communication skills, comfort with sharing personal information, and social navigation. In our research, students perceived written communication skills was the second most important factor explaining the online social ability and extracted 11.45% of variance in social ability. Students' comfort with sharing personal information was the fourth factor and extracted 4.43% of variance. Social navigation was the fifth factor and extracted 3.76% of variance. Both of the newly found factors (i.e., perceived written communication skills and comfort with sharing personal information) extracted more variance of social ability than social navigation did. This suggests that in this particular context, students' perceived written communication skills and comfort with sharing personal information respectively explains more of the social nature of their learning experience than social navigation did. In addition, the items loaded in the social navigation factor included both a) the students' perception of being influenced by the actions of others (e.g. knowing what other students in the course have done helps me know what to do; the actions of other students in the course influence the quality of my work), and b) the students' perception of purposively interacting with others (e.g. interacting with other students helps me accomplish assignments with higher quality than if I were working alone). According to Dourish's (1999) definition of social navigation, students' navigation through an information space is influenced by the activities of others not by actually interacting with them. The idea of social navigation is somewhat complicated by the online learning system including two-way communication tools, in which users can interact with those acting around them. In online learning, which has an emphasis on social participation, students may consider reading (not replying to) others' messages on the discussion board a way of interacting with others. This may explain the two facets of social navigation in this present study. Since, most online course management systems come with both two-way synchronous and asynchronous communication tools, the distinction between perceiving others act and purposive engagement with others may need further explication. Nevertheless, more studies are necessary to investigate students' interpretation of the social navigation items regarding the impact of others actions and that of purposive engagement with others.

The results of multivariate multiple regression indicate that some motivational constructs can be used to explain some of the social ability factors. First of all, in our research, intrinsic goal orientation explains perceived peers social presence. When students have a goal to master the skills taught in a particular class, they tend to perceive interaction with their peers as personal and sociable and may tend to feel connected as well as trust other students. However, intrinsic goal orientation did not significantly explain the variance of students' perceived instructor social presence. This may be an artifact of the nature of online learning tasks and students' learning activities in the surveyed courses. The instructors emphasized peer interaction in their courses which required students to share their own knowledge and skills and to help each other by posting questions and responding to fellow students' questions. Therefore, a student whose goal is to master skills taught in class may perceive more connectedness and sociality with their peers than with the instructor.

Second, self-efficacy explains both perceived instructor social presence and comfort with sharing personal information. The results show that students who have high self-efficacy beliefs perceive high levels of instructor social

presence and connectedness with the instructor but not with their peers. Furthermore, students who have higher self-efficacy beliefs are more willing to share personal information. A possible explanation of the privacy issues is that if students feel confident in performing the task, they may feel less threatened by the environment and less concerned with the fact that their conversation is recorded and their interaction information is accessed by other online students or instructors.

Third, the variances of social navigation and both perceived peers and instructor social presence, are significantly accounted for by task value. Students who perceive high task value perceive their interaction with both the instructor and their peers as sociable and personal and feel connected and trust others. In online learning environments, learning tasks commonly require students to collaborate with other students or to get feedback from their peers. Students who have high task value, therefore, may interact with other students both actively and positively to accomplish their goals and these active and positive interaction experiences positively influence their perceptions of others. In addition, students who have high task value may actively interact with the instructor to perform well the given tasks. For example, if they have difficulties in the learning process, they will interact with the instructors and ask for feedback from the instructor. Moreover, this research shows that students with high task value are more likely to enhance their learning and performance by knowing others' actions and by purposively interacting with others. In other words, students who have high task value use others as learning resources and utilize them effectively for their learning in online learning environments. Laffey et al. (2006) view social ability as "the person's capacity to associate with fellows and to use the members, resources and tools of the social context to achieve something of value". In this case, students perceiving high task value use their peers and instructors as learning resources to accomplish their tasks. Furthermore, the result is in line with the findings from motivation and learning strategy studies that task value is important for students' use of cognitive learning strategies (Pintrich, 1999).

Social comparison theory (Pintrich & Schunk, 2002) may also shed some light on the positive relationship of task value to social navigation. When students value the task as important and useful, they use the performance and actions of others as references. The explanation of social comparison on social navigation leads the researchers to suspect the possible predictive value of extrinsic goal orientation for social navigation. Although the researchers only included intrinsic goal orientation in this study, goal orientations have been recognized as orthogonal instead of two ends of a continuum (Pintrich & Garcia, 1991). Future studies are suggested to explore the effect of extrinsic goal orientation on students' perceived social navigation in online learning as well.

In conclusion, the current research results suggest that social ability in online learning is characterized by five factors (i.e., perceived peers social presence, perceived written communication skills, perceived instructor social presence, comfort with sharing personal information, and social navigation), and that those social ability factors relate differentially to types of academic motivation. Although this research shows relationships between academic motivation and social ability and expands previous motivation research to a new area of understanding social ability in online learning environments, more research is necessary to investigate the role of other forms of academic motivation. Also, further studies should be done to verify the aforementioned factors and to explore yet to be identified constructs which may also contribute to further explicating social ability in online learning environments. Another key line of research is to understand the impact of social ability on learning outcomes. In this regard, additional studies are needed to further explicate social ability in online learning and continue to extend the social ability instrument.

References

Allen, E., & Seaman, J. (2005). *Growing by degrees: Online education in the United States, 2005.* Retrieved November 25, 2005 from http://www.sloan-c.org/resources/growing_by_degrees.pdf

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology*, *80*(3), 260−267.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: W.H. Freeman and Company.

Bures, E. M., Amundsen, C. C., & Abrami, P. C. (1998). Motivation to learn via computer conferencing: Exploring how task-specific motivation and CC expectations are related to student acceptance of learning via CC. *Journal of Educational Computing Research*, *27*(3), 249−264.

Costello, A. B., & Osborn, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation*, *10*(7) (Retrieved April 1, 2006 from http://pareonline.net/getvn.asp?v=10&n=7).

Dourish, P. (1999). Where the footprints lead: Tracking down other roles for social navigation. In A. J. Munro, K. Hook, & D. Benyon (Eds.), *Social navigation of information space* (pp. 15−34). London: Springer-Verlag London Limited.

Duncan, T. G., & McKeachie, W. J. (2005). The making of the motivated strategies for learning questionnaire. *Educational Psychologist*, *40*(2), 117−128.

Fredericksen, E., Pickett, A., Shea, P., Pelz, W., & Swan, K. (2000). Student satisfaction and perceived learning with on-line courses: Principles and examples from the SUNY Learning Network. *Journal of Asynchronous Learning Networks*, *4*(2) (Retrieved April 5, 2006 from http://www.sloan-c.org/publications/jaln/v4n2/v4n2_fredericksen.asp).

Greene, B. A., & Miller, R. B. (1996). Influences on achievement: Goals, perceived ability, and cognitive engagement. *Contemporary Educational Psychology*, *21*(2), 181−192.

Laffey, J., Lin, G., & Lin, Y. (2006). Assessing social ability in online learning environments. *Journal of Interactive Learning Research*, *17*(2), 163−177.

Lapadat, J. C. (2002). Written interaction: A key component in online learning. *Journal of Computer-Mediated Communication*, *7*(4) (Retrieved April 5, 2006, from http://www.ascusc.org/jcmc/vol7/issue4/lapadat.html).

Lee, C. -Y. (2002). The impact of self-efficacy and task value on satisfaction and performance in a Web-based course. *Dissertation Abstracts International*, *63*(05), 1798A.

Merritte, K. K. (1999). A domain-specific investigation of goal orientation, related cognitive and behavioral variables, and prediction model for academic achievement. *Dissertation Abstracts International*, *60*(10), 5243B.

Neuhauser, C. (2002). Learning style and effectiveness of online and face-to-face instruction. *American Journal of Distance Education*, *16*(2), 99−113.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, *91*(3), 328−346.

Ocker, R. J., & Yaverbaum, G. J. (1999). Asynchronous computer-mediated communication versus face-to-face collaboration: Results on student learning, quality and satisfaction. *Group Decision and Negotiation*, *8*, 427−440.

Picciano, A. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, *6*(1), 21−40 (Retrieved June 30, 2005 from http://www.aln.org/publications/jaln/v6n1/v6n1_picciano.asp).

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *Journal of Educational Research*, *31*, 459−470.

Pintrich, P. R., & Garcia, T. (1991). Student goal orientations and self-regulation in the college classroom. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement*, *Vol. 7* (pp. 371−402). Greenwich, CT: JAI Press.

Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: Theory, research, and applications*, (2nd ed.) Upper Saddle River, N.J.: Merrill Prentice Hall.

Resnick, P. (2002). Beyond bowling together: Sociotechnical capital. In J. M. Carroll (Ed.), *HCI in the new millennium* (pp. 247−272). New York: Addison-Wesley.

Rovai, A. P., & Barnum, K. T. (2003). On-line course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education*, *18*(1), 57−73.

Swan, K. (2001). Virtual interactivity: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education*, *22*(2), 306−331.

Tu, C. H. (2001). How Chinese perceive social presence: An examination of interaction in online learning environment. *Education Media International*, *38*(1), 45−60.

Tu, C. H. (2002). The impacts of text-based CMC on online social presence. *The Journal of Interactive Online Learning*, *1*(2).

Tu, C. H. (2002). The measurement of social presence in an online learning environment. *International Journal on E-Learning*, *1*(2), 34−45.

Tu, C. H. (2002). The relationship between social presence and online privacy. *Internet and Higher Education*, *5*, 293−318.

Tu, C. H., & McIsaac, M. (2002). The relationship of social presence and interaction in online classes. *American Journal of Distance Education*, *16*(3), 131−150.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Weisband, S. P., & Reinig, B. A. (1995). Managing user perceptions of email privacy. *Communications of the ACM*, *38*(12), 40−47.

Wenger, E. (1998). *Communities of practice: Learning, meaning and identity.* Cambridge: Cambridge University Press.