Investigating factors that influence social presence and learning outcomes in distance higher education

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Abstract

There are many factors that influence distance learning especially in higher education where collaborative and communicative discourse is necessary for pursuing knowledge. Social presence, among other factors, is an important concept to be facilitated, developed and sustained in distance higher education as it promotes and supports discourse based learning. This study examines the relationship among demographic and other variables, social presence and learning satisfaction. Results showed demographic variables, such as gender, online learning experience and work status were not significant factors in terms of influencing on either social presence or learning satisfaction. While media integration and instructor’s quality teaching were significant predictors of both social presence and learning satisfaction, interactivity among participants was a predictor of social presence but not of learning satisfaction. Along with the study findings, some implications were discussed for online learning practitioners in higher education setting.

Keywords: e-learning; Cooperative/collaborative learning; Social presence; Learning satisfaction

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1. Introduction
Learning can occur anywhere and anytime, even when and where students are apart from their instructor and peer students. Recent technological developments make distance education all possible and encourage more people to become engaged in learning, especially adults. Adults otherwise would not be able to continue their learning due to the possible barriers such as family or professional responsibility to walk in the traditional classroom. According to National Center for Education Statistics (NCES, 2008), 67% of students surveyed for the factors as affecting their distance education decisions mentioned that distance education provides access to college for those who otherwise would not have access. Flexibility of course schedule (68%), more available courses (46%) and increase of student enrollment (45%) followed as other factors.

In school year 2006–07 over 12 million students in US reported were enrolled in college-level credit-granting distance education courses (NCES, 2008). The number of institutions which offered college-level credit-granting online courses reached as many as 2700. The courses include various modes of distance education courses including pure online as well as hybrid/blended online courses. The number would increase if students in non-credit courses had been included. In Korea, the enrollment rate in cyber universities indicates that there has been 25% annual increase since 2001 when first 9 cyber universities were approved to open. Today, a total of 19 cyber universities deliver all the courses 100% online degree programs with over 86 thousands of students enrolled as of 2010 (Korean Ministry of Education, Science and Technology, 2010).

As this upward tendency common in higher education is expected to continue around the world, more concern has been given to how to deliver online courses. Quality has begun to matter more (Nachmias, 2002). The retention rate of overall online courses is still low compared to the one of face-to-face instruction (Doherty, 2006 and Simpson, 2004), which directly indicates ‘academic non-success’ (Diaz, 2002) and ineffectiveness of school programs (Rovai, 2003). A lack of social interaction is playing a significant role in such shortcomings. Online learners complain of the psychological distance they have to overcome (Dickey, 2004). Isolation, disconnectedness and loneliness they feel hinder them from engaging in the class activities (Rovai & Wighting, 2005) and as a result they lose their academic interest and motivation to continue to study, leaving only minimum number who completes the course (Russo & Benson, 2005).

‘Education is social practice’ (Laffey and Lin, 2006 and Shea et al., 2001 ). Social constructivism provided an idea for effective and successful learning by facilitating consistent social interaction among students and their instructor. Because cognitive learning does not occur separately from affective learning (Defino & Manca, 2007), social dimension in class also provides an impetus to form a sound learning community where students develop social bonds which support their academic success. Although social dimension has been emphasized in face-to-face settings with the development of proper instructional design, it just started gaining attention in online learning. There should be more attention, considering that there are limited visual and communicative signals and cues in online classrooms (Muirhead, 2000). There also need to be more studies that explore with the relationship between social factors and students’ cognitive learning as well as overall learning success and the effect on design and development of online courses (Jolivette, 2006).

Social presence is a concept which can be used to examine the quality of social interaction in online learning environment. Social presence was first introduced by Short, Williams, and Christie (1976) and defined as ‘the degree of salience of the other person in the interaction and the consequent salience of interpersonal relationships’ (p.65). While Gunawardena (1995) regarded social presence as the extent by which others are ‘being real’ in a mediated environment, others defined it as the level of perception or feeling of affective and psychological accessibility (Biocca, Harms, & Gregg, 2001) or affective connectedness (Tu & McIsaac, 2002). Meanwhile Rourke, Anderson, Garrison, and Archer (2001) defined it as ‘the ability of learners to project themselves socially and emotionally in a community of inquiry’ (p. 53). ‘Community of inquiry’ is the framework wherein the instructor and learners are engaged in the
interaction of social, technological and pedagogical processes to pursue the construction of collaborative knowledge (Garrison et al., 2000, Rourke et al., 2001 and Shea and Bidjerano, 2009). Kim (2010), based on analysis of the collected definitions, regarded social presence as not limited to recognition of others’ being but extended to include the specific awareness of relations among the members and the degree of proximity and affiliation formed through it.

Many researchers have studied social presence in many different fields for various reasons. These include, but not limited to, promoting positive perception of e-customers on online products (Cyr et al., 2007, Gefen and Straub, 2004 and Kim and Park, 2007), to promoting computer-human interaction (Lee & Nass, 2003) and so on. Social presence became a subject in regards to learning focusing more on human–human interaction. Considering the importance of social constructivism based learning, social presence can be a mechanism to understand how students develop closeness among them and sustain strong and healthy sense of group to form a learning community. Even though social presence is recognized as a subject that should be facilitated, developed and sustained for promoting learning, there has not been enough research done in the field of education. Empirical studies on this subject need to be performed (Jiang and Ting, 2000 and 48).

The purpose of this study was to use empirical data, to investigate how social presence and learning satisfaction are related to demographic variables and other variables such as media integration, quality of instruction and interactivity and what the relationship between social presence and learning satisfaction is. There has not been enough research evidence to show how social presence is developed in regards to promoting successful learning. Therefore this study intended to examine the effects of those variables on social presence and learning satisfaction. In addition, while social presence has a positive correlation with learning outcomes, the debates on whether social presence causes a direct increase in learning outcomes has not yet been solved. Swan and Shea (2005) asserted a need for additional research on the relationship between social presence and student learning. For the purpose of making an inquiry into the relationship between social presence and learning satisfaction, this study looked into the possible causal relationship of these variables.

2. Literature review and research hypotheses

According to previous studies, the levels of social presence and learning outcomes vary by gender. Rovai and Baker (2005) reported different learning experience between genders showing that female students found online learning more social and more beneficial and learned more than male students. Another study found that female students tend to be more active in social and interactive behaviors, sending more interactive messages than males (Barrett & Lally, 1999). Based on those findings, this study proposed that social presence and learning outcomes vary by gender.

Online learning experience has also been reported to have close relationship with social presence and learning satisfaction. In their report that compared social presence in different modes, Hostetter and Busch (2006) posited those students who had taken more online courses tended to perceive social presence in more positive way, while there was no difference found in social presence between students of online and those of face-to-face courses. It is assumed because they have experienced the processes of online courses, those students with prior online learning experiences are able to develop or keep a certain level of their social presence and overall satisfaction of the course. In the meantime, because new students have higher expectations in terms of input and support that they would get from instructor than veteran students (Brown, 2001), the former tend to be more discouraged when those expectations are not met. Accordingly, this study proposed that students’ online learning experiences as measured by the number of online semester(s) previously taken is positively related to their perception of social presence and learning satisfaction.

Work status is another variable that influences students’ learning experience. It may be assumed that students who have full time jobs might have less time for learning in an absolute comparison with those who either have part time
jobs or are full time students. Therefore it is hypothesized that students who have full time jobs experience less social presence as well as less learning satisfaction. Based on the literature reviewed in regards to gender, online learning experience and work status, the following hypotheses were proposed:

**H1a.**
Gender, the number of online semester(s) enrolled and work status are positively related to students' level of social presence.

**H1b.**
Gender, the number of online semester(s) enrolled and work status are positively related to students' level of learning satisfaction.

Short et al. (1976), the originators of social presence theory, argued that social presence is different depending on the kind of communication medium and ranked face-to-face communication with high social presence where as computer-based communication had comparably low social presence. However, their argument that inherent characteristics of communication system determine the level of social presence and learning satisfaction cannot be totally consented and it was questioned by many other researchers. Some researchers (e.g., Gunawardena, 1995, Perse et al., 1992 and Tu, 2002) found that the quality of communication could be perceived differently even in same mediated and could be perceived even more in CMC (computer mediated communication) than in face-to-face settings even though the former has limited signals and cues to deliver communication compared with the latter.

Rather, it is skills and techniques involved in using the communication platforms of a medium to impact the quality of communication and students' learning experience (Shen and Khalifa, 2008 and Tung and Deng, 2006). Effective utilization of learning tools such as synchronous chat, streaming video and audio, asynchronous discussion board can positively influence students' perception of their learning and social presence, which as a result compensates the lack of real contact. Considering the growing trend of e-learning accompanied with those technical devices and preferable factors that are favorable to e-learners, the media integration is regarded as a matter of design of software and the effectiveness of its usage to assist students' learning. Therefore this study proposes that students’ perceptions of the level of media availability and effective usage, termed as media integration, can positively influence the level of their social presence and learning satisfaction. The hypotheses are as follows:

**H2a.**
The level of media integration is positively related to the level of social presence.

**H2b.**
The level of media integration is positively related to the level of learning satisfaction.

How students perceive the instructor’s teaching in his/her roles and activities is related to the perception of social presence and their learning (Picciano, 2002 and Stacey, 2002). Many researchers such as Garrison, Cleveland-Innes, and Fung (2010) and Shea and Bidjerano (2009) empirically proved that teaching presence is a determinant to predict social presence and cognitive presence of online students in higher education. Instructor’s teaching, emphasized as a core element to establish and sustain social engagement and cognitive gain could be realized by showing quality instruction practices in cyber space, which led to the development of community of inquiry. Instructors’ teaching practices are not limited to providing timely feedback and motivating students to promote their learning but include socially responding to and communicating with them so that they can have a sense of learning community through collaboration (Gunawardena & Zittle, 1997). Relating instructor’s teaching to students’ social presence and learning satisfaction, this study proposed the following hypotheses:

**H3a.**
The quality of instruction is positively related to the level of social presence.

**H3b.**
The quality of instruction is positively related to the level of learning satisfaction.

In the communication process, interactivity takes on an important role in forming interpersonal relationships (Reio &
If only one-way communication takes place, it cannot be called interactivity because it basically needs interchangeable roles of both sender and receiver. The reciprocity nature of interactivity can enhance social presence in learning environment. Tung and Deng (2006) found that students perceived higher level of social presence from an active-interactivity environment than passive-interactivity environment. Even though their study was based on computer–human interactivity environment where instructional programs within the computer were manipulated to communicate to students’ responses, it can be inferred from its result that human–human interactivity, which is more responsive among participants affects the degree of social presence and learning outcome. So the following hypotheses were made:

H4a. The level of interactivity is positively related to the level of social presence.

H4b. The level of interactivity is positively related to the level of learning satisfaction.

Social presence can be understood as a similar concept of immediacy. Immediacy, defined as the degree of closeness with others which relates to communicative behaviors to improve nonlinguistic interaction by Mehrabian (1969), has been much examined in relation to students’ learning outcomes in the traditional classroom setting. The research on immediacy in face-to-face classrooms has been mostly in regards to teachers' verbal and nonverbal behaviors. Researchers found that teacher immediacy is positively related to not only students’ cognitive learning (Gorham, 1988, Kelly and Gorham, 1988 and Richmond et al., 1987) but their affective learning (Chesebro, 2003, McCrosky et al., 1996 and Richmond et al., 1987). Unlike face-to-face classrooms, online classes have limitation to adopt the concept of immediacy as they are where nonverbal behaviors were hard to represent, verbal behaviors were delivered only or mostly through text and interaction with students is regarded as equally important as interaction with teachers in terms of construction of knowledge. However, the positive relationship between immediacy and learning outcomes in face-to-face settings has been established sufficiently to infer that social presence is related to learning satisfaction in online learning contexts as well. Social presence also has been reported as a critical factor affecting students’ learning outcome in a mediated environment. Russo and Benson (2005) found that perceived presence of others including the instructor is correlated with students’ satisfaction with their learning. Richardson and Swan (2003) also demonstrated social presence was a significant predictor of learning satisfaction, taking 58% of the variance in students’ satisfaction in CMC. Hostetter and Busch (2006) also emphasized the teachers’ role in advancing students’ social presence after they found social presence could explain as much as 40% of learning satisfaction in their study. Based on the reviewed relationship between social presence and learning satisfaction, the following hypothesis was proposed:

H5. The level of social presence is positively related to the level of learning satisfaction.

3. Method

3.1. Instrument development

To develop a self-reported survey, relevant literature was reviewed and relevant measures validated in previous studies were extracted to make a comprehensive questionnaire. The questionnaire comprised of two sections, one of demographical information and the other of students' perception on the research construct in question of this study. Demographical information included age, gender, the number of semester(s) taken and work status of respondents. The research constructs for questionnaires include media integration, quality instruction, interactivity, social presence and learning satisfaction.

Media integration scale was composed of 4 items from Kim (2007) to measure students’ perceived level of availability and usage of media formats including synchronous discussion forums, reference linkage and other tools such as images, graphics, audio and video slips shown with texts (e.g. ‘The class offered synchronous discussion forums...”).
where I can discuss the topic’, ‘a variety of tools were used to promote learning’). The reliability for the items was verified using internal consistency in the study and Cronbach a was .839.

The quality instruction scale (QIS) was taken from the part of Student Course Experience Questionnaire (SCEQ) that was been developed by the University of Sydney to measure students’ perception of their experience at degree level for teaching quality assurance (Ginns, Prosser, & Barrie, 2007). Updated from original version of Course Experience Questionnaire (CEQ) that was developed to survey students after they graduate, SCEQ was modified for use with currently enrolled students, so that it may be used as a more timely indicator of teaching quality at university level. Even though SCEQ was developed to assure the quality of the campus degree program, part of its scales was chosen to be used in this study because it was well verified in its validity and reliability for measuring the teaching quality at the degree program in higher education (Ginns et al., 2007) among students who were being exposed to face-to-face as well as online learning (Ginns & Ellis, 2009). SCEQ was composed of 5 factors, which are: good teaching scale (GTS), clear goals and standards scale (CGS), appropriate assessment scale (AAS), appropriate workload scale (AWS) and generic skills scale (GSS). This study took GTS and it showed reasonable level of internal consistency (α = .83) in the study of Ginns and Ellis (2009). The present study made a little adjustment of GTS in terms of wording to contextually fit it into the Korean cyber university and named it ‘quality instruction scale (QIS)’ to better represent the content. For example, the words ‘the teaching staff’, ‘the staff’ and ‘my lecturers’ from GTS were all standardized into ‘my instructor’ in QIS. In addition, ‘this online course’ was used instead of ‘this degree course’. Following the adjustment, QIS used 6 items to measure the level of quality of instruction (e.g. ‘my instructor is extremely good at explaining things’, ‘my instructor of this online course motivates me to do my best work’, ‘my instructor put a lot of time into commenting on my work’).

Interactivity, constituting 6 items, was taken from Kim (2007) to measure the level of interactivity that students perceived with other participants, peer students and instructor (e.g. ‘I participated in receiving and sending information and knowledge with other participants in class’). The Cronbach α of the scale was .84.

Kim’s (2010) social presence scale was adopted to measure the degree of social proximity and affiliation that students perceived toward other participants including peer students and instructor in the online course. She developed and verified 19 item scales with 4 factors using exploratory and confirmatory factor analyses and reliability analysis. Those 4 factors were mutual attention & support, affective connectedness, sense of community and open communication and they were constituted of 6, 5, 4 and 4 items each. The consistency reliability of those 19 items was Cronbach α .92. She later confirmed 18 items among them using Rasch model analysis, deleting an item with extremely high outfit in MNSQ and made sure that the factor structure remained same (Kim, 2007). The item omitted was ‘I have called other participants by their names’ because it measured rather the immediate behaviors of students, not their perceptions, as the scale originally had intended. Therefore, the remaining 18 items were used in this study (e.g. ‘I respected the others’ opinions in making decisions’, ‘I was able to be personally close to other participants in the class’, ‘I felt the other participants acknowledged my point of view’).

The learning satisfaction scale was composed of 7 items to measure students’ perceived satisfaction with their learning. This was originally started from two separate constructs, perceived learning achievement and class satisfaction. The perceived learning achievement scale with 4 items measured how student perceived their learning (e.g. ‘I think I learned a lot from this course’ and ‘I think this class satisfied my learning needs’) (Eom, Wen, & Ashill, 2006) and class satisfaction scale with 3 items measured how satisfied students are with the course (e.g. ‘Overall I am satisfied with this course’ and ‘I would like to recommend this course to others’) (Sun, Tsai, Finger, Chen, & Yeh, 2008). However, the study showed the possibility of multicollinearity between two constructs showing high alpha correlation over .80. Recognizing the semantic resemblance of these two constructs, the decision was made to combine them as one construct to measure learning satisfaction.
All the scales were modified to be fit into this study in terms of language and measured in 5 likert scale, ranging from 1, strongly disagree to 5, strongly agree. Since quality instruction scale has only English version, it was translated by the authors into Korean and examined and confirmed by two other professional translators. Other measures were either developed originally in Korean or had a Korean version translated in previous studies and so were taken to be used in this study without additional revision. The reliability for each scale had been all verified in previous studies. They were again verified in this study to be determined. All of them showed reasonable alpha coefficients, .732, .845, .876, .897 and .925 for media integration, quality instruction, interactivity, social presence and learning satisfaction respectively.

3.2. Contextual background

The courses which the survey had been taken from were ‘Introduction to Education’ and ‘Lifelong Education Teaching Practice’ of K cyber university in Korea. As with other courses at the university, video clips of recorded lectures were shown online each week, accompanied by relevant course materials. Other learning support tools such as Q&A and discussion forums were used as well as other social support tools such as a chat room. When confidentiality issues came up, students or the instructor used ‘notes’ or emails for communication.

Students were required to watch a 40–60 min video clip assigned each week and to participate in discussions in order to complete the 16 week course. Discussion subjects were assigned by the course instructor and students posted their ideas and responded to others accordingly for a limited period in each individual forum. Each course has an average of 3 discussion forums per semester, open for duration of 2–3 weeks each, depending on the difficulty or depth of the subject.

Evaluations were made based on attendance (checked by completion of steaming video audit for the period of 3 weeks given to each), real-time exams (students were notified of exam days and times prior to the course enrollment. In inevitable cases, make-up test was provided), quality & quantity of participation in discussion and Q&A.

The instructors in both courses surveyed were trained to socially and effectively approach to and interact with the students by using one-way as well as two-way communication tools. They made welcoming remarks, used friendly words and emoticons, and added real-life examples when delivering lessons in streaming videos or posting messages in announcements. They did so acknowledging that students tend to perceive the course as quality instruction and instructor as socially present when their expectations for horizontal relationship with instructor and authentic approach of the course are met (Kim & Richard, 2008). Through the use of a course management system, instructors could review the overall status of students’ participation. Instructors sent ‘notes’ and emails to encourage those who had skipped watching weekly streaming videos or showed less or nonexistent participation in the course activities. Except for weekends and holidays, instructors tried to provide answers and feedback within 48 h of students’ posts, shared their personal stories and daily greetings through chat room, and made occasional remarks in discussion forum. In order to encourage the development of social connections among participants, instructors urged students to post their stories to share with other participants and to actively participate in the discussion forums ([Aragon, 2003], [Rourke et al., 2001] and [Rovai, 2007]). Instructors used each tool available to them to its greatest extent in order to facilitate academic and social integration among the students throughout the courses.

3.3. Sample collection & data analysis

The online survey was conducted for 3 weeks from May 12, 2010 until the end of the semester. The total number of students surveyed was 210 and 84 reported back, resulting 40% of response rate. Of the 84, 3 were not valid because of their improper answers, which left 81 completed samples to be used for analysis. The respondents included 61 females (75.3%) and 20 males (24.7%). Respondents’ ages ranged from 23 to 58, with a mean age of
40.5 (standard deviation, 8.05). Among them, 36 were in their 40’s, making up 44.5% of the total while 27 were in 30’s (33.3%), 9 were in their 20’s (11.1%) and their 50’s (11.1%). While as many as 74 respondents (91.3%) were part-time students with either a full or a part time job, 7 (8.6%) were full time students.

The data analysis was done using Statistical Package for Social Science (SPSS) 12.0. Descriptive and correlation analyses and ANOVA were used as well as multiple regression analysis.

4. Results

The result of descriptive analysis for each variable is presented in Table 1. All the variables showed their mean over 3.00 with quality instruction the highest, 4.13 and social presence the lowest 3.17. Among the four factors of social presence, the mean of mutual attention & support factor was the highest at 3.49, while the one of affective connectedness was the lowest at 2.45.

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. of items</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media integration</td>
<td>4</td>
<td>3.57</td>
<td>.657</td>
</tr>
<tr>
<td>Quality instruction</td>
<td>6</td>
<td>4.13</td>
<td>.565</td>
</tr>
<tr>
<td>Interactivity</td>
<td>6</td>
<td>3.24</td>
<td>.779</td>
</tr>
<tr>
<td>Social presence</td>
<td></td>
<td>3.17</td>
<td>.576</td>
</tr>
<tr>
<td>Mutual attention &amp; support</td>
<td>6</td>
<td>3.49</td>
<td>.579</td>
</tr>
<tr>
<td>Affective connectedness</td>
<td>4</td>
<td>2.45</td>
<td>.828</td>
</tr>
<tr>
<td>Sense of community</td>
<td>4</td>
<td>3.37</td>
<td>.750</td>
</tr>
<tr>
<td>Open communication</td>
<td>4</td>
<td>3.21</td>
<td>.688</td>
</tr>
<tr>
<td>Learning satisfaction</td>
<td>7</td>
<td>4.05</td>
<td>.627</td>
</tr>
</tbody>
</table>

Pearson’s correlation analysis demonstrated that all the variables have significant correlation among others (Table 2). While the correlation between quality instruction and learning satisfaction was the highest with correlation a .582 ($p < .01$), the one between media integration and interactivity was the lowest, .315($p < .01$). These results show that students who appreciated media integration, quality instruction and interactivity tended to have high perceptions of social presence and were more satisfied with their learning. In addition, students with high perceptions of social presence also tended to have high levels of learning satisfaction.

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media integration (1)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality instruction (2)</td>
<td>.159(+)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactivity (3)</td>
<td>.315(++)</td>
<td>.445(++)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social presence (4)</td>
<td>.469(++)</td>
<td>.374(++)</td>
<td>.394(++)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Learning satisfaction (5)</td>
<td>.381(++)</td>
<td>.582(++)</td>
<td>.388(++)</td>
<td>.408(++)</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: $p < .05$, **$p < .01$. 
Demographic variables were examined for their relationship with social presence and learning satisfaction. Neither of gender or work status showed any significant relation with social presence and learning satisfaction (Table 3). The number of semester(s) enrolled was also found to have no significant relation with social presence and learning satisfaction (Table 4). There H1 was denied.

Table 3. Summary of ANOVA analysis.

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>N</th>
<th>Social presence M(SD)</th>
<th>F</th>
<th>Learning satisfaction M(SD)</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
<td>3.25(.591)</td>
<td>.939</td>
<td>4.15(.634)</td>
<td>.799</td>
</tr>
<tr>
<td>Female</td>
<td>61</td>
<td>3.09(.511)</td>
<td></td>
<td>3.98(.600)</td>
<td></td>
</tr>
<tr>
<td>Work status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>61</td>
<td>3.16</td>
<td>.390</td>
<td>4.09</td>
<td>1.857</td>
</tr>
<tr>
<td>Part time</td>
<td>13</td>
<td>3.00</td>
<td></td>
<td>3.96</td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>7</td>
<td>3.19</td>
<td></td>
<td>3.60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>81</td>
<td>3.14(.534)</td>
<td></td>
<td>4.03(.609)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Summary of multiple regression analysis for social presence and learning satisfaction regressed on independent variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Social presence</th>
<th>Learning satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>t</td>
</tr>
<tr>
<td>Online semester(s) enrolled</td>
<td>.097</td>
<td>.559</td>
</tr>
<tr>
<td>Media integration</td>
<td>.366</td>
<td>3.942***</td>
</tr>
<tr>
<td>Quality instruction</td>
<td>.205</td>
<td>2.056**</td>
</tr>
<tr>
<td>Interactivity</td>
<td>.293</td>
<td>2.769**</td>
</tr>
<tr>
<td>Social presence</td>
<td></td>
<td>.064</td>
</tr>
<tr>
<td>F</td>
<td>20.128***</td>
<td></td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>.663</td>
<td></td>
</tr>
<tr>
<td>R square</td>
<td>.440</td>
<td></td>
</tr>
<tr>
<td>Adjusted R square</td>
<td>.418</td>
<td></td>
</tr>
</tbody>
</table>

Note **p < .01, ***p < .001.

The multiple regression analysis was performed to see how much the independent variables can predict social presence and learning satisfaction. As shown in Table 4, a significant proportion of the variance, 44% in social presence was accounted for by media integration, quality instruction and interactivity. When stepwise method was applied to see specific augmentation according to each variable, the first variable, media integration was put into analysis and 29% of the variance in social presence was accounted for ($R^2 .29$, $R .540$, $F 32.545, p < .001$). It was increased by 12% ($R^2 .10$, $R .640$, $F 27.082, p < .01$) and another 3% ($R^2 .442$, $R .665$, $F 20.128, p < .01$) by adding two other variables, interactivity and quality instruction respectively.
Multiple regression analysis was again performed to examine the relationship among variables with learning satisfaction. The results showed learning satisfaction could be predicted by two variables of quality instruction and media integration. Those two variables accounted 49% variance of learning satisfaction, quality instruction alone 41% ($R^2 .414, R .643, F 55.742, p < .001$) and with media integration, an additional 8% ($R^2 .498, R .699, F 37.353, p < .01$).

Based on the study results, media integration was a significant predictor of both social presence and learning satisfaction, which supports H2a and H2b. Quality instruction was also a significant predictor of both social presence and learning satisfaction while interactivity was found to be a significant predictor of social presence but not of learning satisfaction. Based on these results, H3a, H3b and H4a were supported but H4b was not. The study found that social presence was not a significant predictor of learning satisfaction. Therefore, H5 was not supported.

5. Discussion

This study showed that most demographic variables were not related to either social presence or learning satisfaction. Gender showed no significant relationship with either of two dependent variables, which is consistent with the findings of other researchers ([Arbaugh, 2000], [Bourne et al., 1997] and [Wu and Hiltz, 2004]). But with adverse results also found in other research, there is still uncertainty in translating the relationship between gender and online learning experience in general. In this regards, this issue needs to be examined in detail with more accumulated studies with reasonable explanation to support it. One issue to be brought up here regards to contextual factor of gender. Most of those who had reported significant difference over gender in online learning said female students were higher in perceived learning, participating more in class activities and showing more social and interactive behaviors than males ([Barrett and Lally, 1999], [Fredericksen et al., 2000] and [Rovai and Baker, 2005]). However the bulk of the research has been conducted in western contexts. Although not statistically significant, the results of this study, done in eastern context, especially in Korea, showed that male students played dominant roles in discussions and had higher levels of both social presence and learning satisfaction than females. This study result was consistent to the study done in same Korean context ([Kim, 2010]). More studies should be carried out to further examine whether this is due to contextual differences or there are any other reasons.

Previous online learning experience measured by the number of online semesters taken before, was found to have no relationship with social presence or learning satisfaction. Students’ previous experience with online learning might increase their comfort levels. But at the same time, they might have felt no need to introducing themselves to new friends every semester or having social interaction with other peer students in new classes, which hinders the creation of social presence and learning satisfaction in the end.

Students with different work status showed no difference in both social presence and learning satisfaction. This is likely because students can be relatively relieved from the burden of work by taking online courses. Compared to face-to-face courses, they would be able to save more commuting time for their learning with more easy accessibility to online courses from any place, even in the office. This result again reinforces the benefits of online learning for adult learners.

The evidence showed that both social presence and learning satisfaction are affected by media integration and quality instruction. How to appropriately select and utilize media should be considered to promote students’ social presence as well as satisfaction with their learning. Each learning and social tool in the course has its own purpose. Instructors are encouraged to choose each tool to its full potential so that students are motivated to experience different media tools and encouraged to learn through them. These results support those studies that proved a variety of media format in online courses enhances students’ learning experience ([Arbaugh, 2005] and [Tung and Deng, 2006]).
Instructor’s teaching played also an important role with regards to students’ social presence and learning satisfaction. The close link between quality instruction and students’ perception of social presence and learning satisfaction provides useful implications for online faculties as well as faculty trainers. Instructor’s role as a facilitator includes provision of sound learning environment where students receive timely feedback and encouraging motivation, feel to share their personal stories and matters, feel valued of their contributions and are provided positive guidance for the pursuit of their successful learning ([Bangert, 2004], [Marks et al., 2005], [Rovai, 2007] and [Stacey, 2002]).

Interactivity was found to be a good predictor of social presence but not of learning satisfaction. The more students participated in the class activities, the more they tended to feel socially present and be acknowledged among others. This result is consistent with previous research that showed positive association between two variables ([Tu and McIsaac, 2002] and [Tung and Deng, 2006]). Mandatory participation of students in discussions with the given minimum number of messages to be graded may be a good enforcer especially at the beginning stage of the class so that they have more chances for social interaction and engagement in the learning community. Also worthwhile is that faculty has access to lurking students by using more personalized contact such as sending personal emails or memos or even phone calls to encourage them to participate. Such interaction could be geared to increase quality in social integration. Learning environment where students recognize the usefulness of interactivity is vital for them as distance learners who may otherwise feel loneliness and isolation ([Stacey, 2002]).

Social presence has been emphasized as an important factor to be created, developed and sustained for successful learning ([Aragon, 2003], [Leh, 2001] and [48]). This study, however, showed that social presence had no causal relationship with learning satisfaction even though positive correlations between two existed, which is consistent with the study result of So and Brush (2008). In their study to examine the relationship among three variables, collaborative learning, social presence and satisfaction, So & Brush found only significant correlation between social presence and satisfaction, not causal relation. Since the present study does not purport specifically to examine the reason of non causal relationship of two variables, only speculations could be given at this time.

This study proposes the presence of ‘critical mass’ as an attribute of social presence based on its developmental nature. As descriptive statistical results showed in this study, social presence has four factors, mutual attention & support, sense of community, open communication and affective connectedness as ranked from the highest mean to the lowest. Considering that the construct with highest mean in general is interpreted as the one with which respondents hardly agree, the affective connectedness factor is the one with which students hardly agree and only those who have high perception of social presence can agree. On the other hand, the mutual attention & support factor with lowest mean is the one with which students most easily agree. This implies that social presence is developed from perception of mutual attention & support, sense of community, open communication to finally the affective connectedness. The developmental inclination of social presence this study suggests is consistent to the findings of other researchers who argued that social presence is developed from the recognition of spatial presence to psychological involvement ([6] and [Kim, 2010]).

The developmental inclination of social presence additionally suggests that social presence should arrive at certain point in order to be fully recognized and operated. Based on this speculation, this study executed multiple regression analysis again to see different cycles of groups with different level of social presence. Considering that the lowest mean point of affective connectedness factor is the one least agreed, groups were divided at the mean point of second social presence factor. Interestingly, the results showed that high social presence group (n = 40) showed a significant causal relationship between social presence and learning satisfaction while other variables remained with same effect. The low social presence group (n = 41), however, kept the original non causal relationship between two. For those who have perceived social presence above certain point, social presence had a direct influence on how
they perceive their learning experience. The certain point where social presence has different mechanism with regards to the perceived learning experience is determined as ‘critical mass’ of social presence.

The existence of critical mass can be traced back from other studies. Gunawardena and Zittle (1997) found that among low social presence students, those who recognized low sense of equal opportunity in class rated higher satisfaction than those who did high sense of equal opportunity. It was an unexpected result since our general assumption might be that students who perceived high equal opportunity in participating in class activity would be more satisfied. In the same regards, when examining the effectiveness of use of emoticons, they found that low social presence groups showed no effect of emoticons on satisfaction while high social presence groups showed improvement of satisfaction as the use of emoticons increased. Their study implied that social presence has a certain point where it causes different association with other variables. It is the critical mass, this study suggests, where initial impersonal level of relational communication is being changed to more developed forms (Walther, 1996). Thus it is important to accumulate students’ social presence enough to reach to the critical mass so that it has a direct effect on their learning experience. If not, students might only engage in social activities that exert no influence on their learning. To establish a critical mass of social presence, online instructors should include in the student orientation role adjustment with introduction of importance of social presence and build and sustain it in early stage of the course (Garrison, Cleveland-Innes, & Fung, 2004).

Considering that interactivity was a significant factor of social presence, but not of learning satisfaction, another explanation can be drawn from the nature of class interactivity. It draws to question whether interactivity in classes surveyed was focused too much on ‘social’ interactions and not enough toward constructive discussion to seek students’ learning. Social integration is an important issue in learning environment because it is a factor based on which students can collaborate for pursue of their learning. This assures again that social activities should be integrated into the course context rather than pursued purely for socializing (Wise, Chang, Duffy, & del Valle, 2004).

6. Conclusions

Using data collected from students of a cyber university in Korea, this study examined the associations of three variables, media integration, quality instruction and interactivity with social presence and learning satisfaction. The study results indicated that media integration, quality instruction and interactivity are good predictors of social presence while only media integration and quality instruction predict learning satisfaction. Furthermore, this study confirmed the developmental inclination as a nature of social presence and suggested the presence of critical mass as its attribute in online learning environment.

Admittedly this study has some limitations. First, the samples were only collected from a limited number of students from one school in Korea, which limits generalization of this study results. Future study should collect data from more participants from more diverse online courses. Second, because the survey was done online, it didn’t control non-respondent bias. Those who didn’t respond to the survey might be the ones that felt little degree of social presence or were not satisfied with their learning experience. The study on non-respondents needs to be examined to see how their experiences are different from those who responded to the survey and find a pattern to explain their unique learning experiences and perceptions.

Despite those limitations, this study found that social presence and learning satisfaction interact with other variables, which can provide many practical implications that practitioners can use. First, students appreciate instructors that try to maximize the effective use of the media. Even though online tools of state of arts are available, instructors often manage to use simple tools for only unloading the messages on class announcements and collecting the assignment. Students would be more socially engaged and satisfied with their learning if they see ‘liveliness’ and ‘dynamics’ with the diverse media formats used by instructor. This may include opening asynchronous discussions, facilitating quality
interaction, and putting useful resources in forms of images, graphics and even audio or video files. Second, it should be noted that the primary goal in online learning is not only to increase the social presence among participants, but to ultimately enhance student’s learning through constructive discussion and collaborative inquiry. Building a social atmosphere by putting welcome messages and including students’ profile in course sites (Aragon, 2003), using humors and emoticons and disclosing the self ([Rourke et al., 2001] and [Wise et al., 2004]) can only be meaningful when it comes with learning activities, such as generating and facilitating effective discussions (Rovai, 2007), providing timely feedback and meeting overall students’ academic demands (Kember, Lai, Myrphy, Siaw, & Yuen, 1992). Only then can social presence contribute students’ successful and quality learning experiences ([Delfino and Manca, 2007], [Stacey, 2002] and [Tung and Deng, 2006]).

It remains to future study a task to develop instructive methods and skills, with which students are able to develop their social presence to its critical mass. Additional studies should be proceeded to examine the relationship between social presence and learning satisfaction and further inquire the relationship between social dimensions and learning outcomes.

References


Hostetter and Busch, 2006 C. Hostetter and M. Busch, Measuring up online: the relationship between social presence and student learning satisfaction. *Journal of Scholarship of Teaching and Learning, 6* 2 (2006), pp. 1–12.


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