

# Sense of Social Presence Versus Learning Environment : Centering on Effects of Learning Satisfaction and Achievement in Cyber Education 2.0

Jihwan Yum\*

## Abstract

This study intended to evaluate the viability of cyber education in terms of learning satisfaction and learning achievement. The study integrated two research streams such as social presence model and learning environment model. Where the learning environment model emphasizes the components of learning aids, social presence model considers more deeply the relationships among peers and with instructors. These two research streams have been considered relatively independently. The study integrated these ideas and measured their reliabilities and validities. The results demonstrate that the two constructs are relevantly independent and both of these constructs are very important considerations for the success of cyber education. The study concludes that cyber education 2.0 requires more social presence factors than the learning environment factors such as technological development or new equipments.

Keywords : Cyber Education, E-Learning, Business Education, Learning Satisfaction, Learning Achievement

## 1. Introduction

E-learning is the use of telecommunication technology to deliver information for education and training. With the development of information and communication technology, e-learning has emerged as the paradigmatic source modern education. Especially the main source of business education has shifted to the e-learning these days [Yum, 2009]. The e-learning market has a growth rate of 35.6%, but some failure cases still exist [Arbaugh and Duray, 2002; Wu et al., 2006]. The most representative case of failure can be noted as the halt of learning. However, little is known about why some students stop their e-learning after their initial experience [Yum, 2009]. We believe that the reason of failure is related with the dissatisfaction of e-learning as other e-commerce mechanism applies. The next generation of e-learning is about to come named as cyber education 2.0. The 2.0 denotes the new paradigm of cyber education from the technology oriented to the relationship oriented, from contents oriented to the interaction oriented, and from the knowledge push oriented to the participation pull oriented learning.

The great advantages of e-learning include liberating interactions between learners and instructors, or among learners, from limitations of time and space through the asynchronous and synchronous learning network model [Katz, 2000; Katz, 2002]. The technological development however, has shifted the perspective of e-learning education from technology dimension to the so-

cio ecological dimension [Kim, 2011; Song et al., 2004]. Some sources indicate that online learning enables institutions and/or instructors to reach new learners at a distance, increases convenience, and expands educational opportunities [Bourne et al., 1997; Hofmann, 2002]. The technological aspects to reach the students were the most important factor. However, the movement toward e-learning is not grounded in compelling empirical evidence that it is effective and/or beneficial for learning [Hannafin et al., 2003]. The educational effectiveness has not been significantly considered compared to the accessing and capturing issues of e-learning.

Researchers argue that many of the studies in e-learning still remain rather anecdotal than empirically proved [Hara and Kling, 1999]. Most studies come from the point of view of the faculty members teaching the course or the instructional technologist designing and/or developing the course [Berge, 1997; Bourne et al., 1997]. While the overall perspectives and faculty based studies are important for understanding the potential value of online learning, few studies have detailed the learners' perspectives of online learning [Hara and Kling, 1999]. There is a need for continuing research studies related to specific areas (e.g., pedagogical strategies to promote learners' on-line learning experience, the impact of learner characteristics on learner's Web-based learning experience), as well as overall perceptions [Cereijo et al., 1999; Hara and Kling, 1999; Hartley and Bendixen, 2001].

Traditionally, information system research clea-

ly shows that user satisfaction is one of the most important factors in assessing the success of system implementation [Delon and Mclean, 1992]. The constant growth of the information and communication technology influences and changes the rule of game from technical implementation of learning contents to the socio-ecological point of view, in other words, the sense of social presence. This, in turn, may also change the students' perceptions of their online experience. Continued studies of learners' perspectives of online learning environments are needed in order to build more effective socio-technical learning environment that can optimize the learning experience within this ever-changing technical landscape.

## 2. Theoretical Background

The study has tried to integrate two seemingly distinct areas such as social ecology and self directed learning into one research agenda of learning satisfaction. Social ecology integrates psychosocial environment research that is closely related to the social presence model [Kim, 2011]. Kim denoted the social presence as below; "Short, Williams and Christie [1976], who first introduced the concept social presence, defined it as the 'degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships' (p. 65). Salience here means the relative significance of the others in the interaction [Kehrwald, 2008]. They thought of social presence as a single dimensional concept related to intimacy [Argyle

and Dean, 1965] and immediacy [Mehrabian, 1969] and tried to adapt those concepts in the mediated environment to increase the efficiency of communication."

Social presence model identified the critical constructs that facilitate distance education, in other word, cyber education. The model contributed both academia and practitioners to recognize intra students supports, efficient communication, and sense of community for cyber education. More importantly, most cyber education research imported the idea of social presence to accelerate the intra group communication and relationship building.

Even though the concepts of social presence identified critical instruments for cyber education, many of the studies still demonstrate conflicting results and relationships between the social presence construct and educational performance [Merisotis and Olsen, 2000; Olsen and Wisner, 2002]. Based on the inconsistent results of social presence model, Walker and Fraser [2005] developed and validated new idea of cyber education through the "distance education learning environment survey" (DELES model). The model was devised on the learning environment research stream. The DELES model identified 6 domains of environment such as instructors, students, personality, learning materials, learning activities, and personal autonomies.

Learning environments research, grounded in psychosocial environments [Fraser, 1998a; Goh and Khine, 2002; Tobin and Fraser, 1998] involves a variety of educational research and

evaluation methods that tend to be dominated by the assessment of students' academic achievement [Fraser, 1998b]. Learning environment research have demonstrated that students' perceptions of their educational environments can be measured with survey instruments and that learning environment assessments are consistent predictors of student outcomes [Fraser, 1998a; Goh and Khine, 2002]. Thus, evaluation's focus turns away from individual student achievement and toward the effectiveness of the environment of the learning organization [Walberg, 1974]. Moreover, variables within learning environments themselves can be changed to achieve different affective and cognitive learning outcomes [Anderson and Walberg, 1974]. Many studies of learning environments and learning outcomes demonstrated that learning environments dimensions consistently identified as determinants of learning [Fraser, 1986; Fraser and McRobbie, 1995; Khine, 2002; Zandvliet and Fraser, 2004].

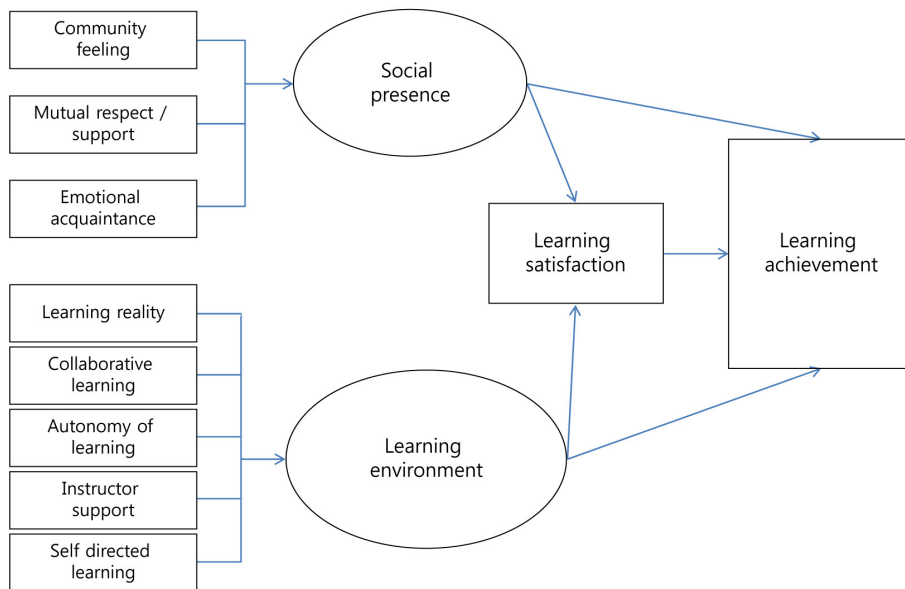
Even though the social presence model and learning environment model share some relevance such as the idea of mutual communication and sense of commitments in their variables constructs, the perspectives and instruments of two constructs are quite different and stand apart. Social presence model emphasizes learners' attitude, where learning environment model underlines interactions among learners and instructors. However, the level of analysis is relatively similar because both research streams emphasize individual perspectives.

We tried to develop the ideas of compre-

hensive view of social presence and learning environment through the interlocking idea of cyber education satisfaction and achievement. Learning environment has been noted as a key variable for educational performance for both traditional and non-traditional students in the cyber education [Yum, 2009]. Moreover, the learning environment affects more significantly to the performance for the non-traditional students because the non-traditional students have various backgrounds with limited time for devotion to study [Yum and Park, 2006]. The non-traditional students were noted to have different attitudes and objectives for their education [Yum, 2009] compared to the traditional students.

These differences need to be explored in terms of social presence approach. The non-traditional students such as cyber university students are not much explored by the social presence ideas where may research have covered the non-traditional students in terms of different learning environment. However, the variables related with the social presence may also have a significant relation with the learners' satisfaction and learning achievement [Walker and Fraser, 2005]. Based on these arguments, the study tried to evaluate the ideas of social presence and learning environment with the learning satisfaction and achievement in the cyber education.

The study did not intend to rank which variable is more significant to the learning achievement. The study investigates whether the two different ideas are actually existed in the



〈Figure 1〉 Research Model

same time and are related with the learning achievement independently. The study will categorize the concepts and evaluate the relevance of the concepts developed in the research.

### 3. Research Design

The research population for the study was the one of the most famous cyber university students in Korea from various majors. The students are from the diverse backgrounds such as floor workers, middle managers, and even top managers. The survey sample was a non-probability sample of convenience drawn from voluntary participants enrolled in undergraduate business related classes. The characteristics of Cyber University help to escape the problems of sample homogeneity and randomness. The samples of the respondents are full time undergraduate cyber university students. All of the

students are Koreans. The study did not aim to compare responses from the different cyber universities. Rather the study tries to find an insight concerning the general cyber education environment. The average age of students is 34 and the age stands from early 20s to late 50s. The most respondents have full time jobs and many of them have children. These characters lessen the sample bias problem from a single institution.

The survey instrument was developed from the references of social presence research and distance education learning environment survey. The survey questionnaire was developed by 5 point Likert scale. The questionnaire has 55 questions. Based on the explanatory factor analysis, the researcher identified two relatively exclusive set of components. The first set is named as social presence. The questions are related with the community idea and relation-

ship building process through the cyber learning environment. The second set of components is learning environment. The learning environment covers ideas such as self directed learning environment and relevance of learning material. The first set is somewhat related with the collective perspective of cyber learning where the second set of questionnaire is more related with individual attitude in the cyber learning environment.

#### 4. Results

The first set of variables that constitute the idea of social presence is presented in the <Table 1>. The question items related with the

social presence demonstrated three components. The first component is named as “community feeling.” The second one is named as “mutual interest and support.” The third factor is named as “emotional connectedness.” All three factors explain 69.141% of variances.

The second set of variables is related with the learning environment. The learning environment variables constitute 5 components. The first one is named as “learning reality.” The second and third component is “collaborative learning” and “autonomy of learning.” The fourth and fifth component is defined as “instructor utilization” and “self directed learning” respectively. The explained variance is 65.643%.

<Table 1> Components of Social Presence (by Principle Component analysis with Varimax rotation)

|   | components        |                        |                        |
|---|-------------------|------------------------|------------------------|
|   | Community feeling | Mutual respect/support | Emotional acquaintance |
| 1. I pay attention to the peer students                     | .255              | <b>.684</b>            | .402                   |
| 2. I concentrated to the dialogues with the peer students   | .285              | <b>.685</b>            | .426                   |
| 3. I believe the group work is efficient                    | .136              | <b>.679</b>            | .186                   |
| 4. I was encouraged to learn by peer students               | .313              | <b>.668</b>            | .210                   |
| 5. Peers respected my opinion                               | .407              | <b>.696</b>            | .213                   |
| 6. I respected peer students' opinion                       | .381              | <b>.721</b>            | .188                   |
| 7. I made friends through the class                         | .390              | .366                   | <b>.659</b>            |
| 8. I enjoyed the private chatting                           | .255              | .344                   | <b>.772</b>            |
| 9. I was influenced by the peers' emotions                  | .256              | .222                   | <b>.769</b>            |
| 10. I believe I know in depth my peer students              | .471              | .282                   | <b>.649</b>            |
| 11. I gained community feeling through the class            | <b>.607</b>       | .289                   | .518                   |
| 12. I felt the group membership even in the cyber space     | <b>.585</b>       | .417                   | .288                   |
| 13. I felt the peer students' efforts for community feeling | <b>.665</b>       | .378                   | .205                   |
| 14. The class discussion made community work                | <b>.779</b>       | .256                   | .218                   |
| 15. I enjoyed the class discussions                         | <b>.669</b>       | .254                   | .397                   |
| 16. I can find how my peer students respond to my comments  | <b>.746</b>       | .217                   | .260                   |
| 17. I felt the peer students understood my perspectives     | <b>.800</b>       | .291                   | .246                   |
| 18. I felt the opinions were easily transferred             | <b>.791</b>       | .296                   | .290                   |
| Eigen Value   | 10.335            | 1.187                  | 0.924                  |
| Variance Explained  | 57.415%           | 6.593%                 | 5.133%                 |

&lt;Table 2&gt; Components of Learning Environment (by Principle Component Analysis with Varimax Rotation)

|  | components                        |                        |                      |                    |                        |
|--|-----------------------------------|------------------------|----------------------|--------------------|------------------------|
|  | Practical application of learning | Collaborative learning | Autonomy of learning | Instructor support | Self directed learning |
| 19. I try to ask a question to the instructor                                  | .193                              | .163                   | -.087                | <b>.604</b>        | .261                   |
| 20. I believe the instructors answer the questions sincerely                   | .150                              | .029                   | .180                 | <b>.733</b>        | .166                   |
| 21. I expect the appropriate feedback from the instructor                      | .184                              | .063                   | .238                 | <b>.713</b>        | .115                   |
| 22. I am not uncomfortable to the instructor's encouragement for participation | .233                              | .044                   | .266                 | <b>.705</b>        | .048                   |
| 23. I am not uncomfortable to contact the instructor                           | .176                              | .124                   | .125                 | <b>.627</b>        | .000                   |
| 24. Sometimes I study with my peer students                                    | .099                              | <b>.863</b>            | -.122                | .024               | .037                   |
| 25. Sometimes I prepare assignments and test with my peers                     | .072                              | <b>.882</b>            | -.117                | .010               | .064                   |
| 26. I share various information with my peer students                          | .109                              | <b>.899</b>            | .030                 | .088               | .012                   |
| 27. I share my opinion with my peer students                                   | .140                              | <b>.898</b>            | .008                 | .107               | .032                   |
| 28. I participate the group project eagerly                                    | .215                              | <b>.687</b>            | .054                 | .191               | -.002                  |
| 29. I try to apply the class knowledge to the field                            | <b>.676</b>                       | .081                   | .212                 | .313               | -.008                  |
| 30. I consult additional information concerning the class material             | <b>.657</b>                       | .136                   | .173                 | .217               | .051                   |
| 31. I apply the class knowledge to the outside activities                      | <b>.748</b>                       | .118                   | .198                 | .208               | .112                   |
| 32. I apply my experiences to the class  | <b>.734</b>                       | .045                   | .263                 | .225               | .096                   |
| 33. I learn the real cases at the class  | <b>.767</b>                       | .129                   | .142                 | .120               | .179                   |
| 34. We share the field experiences at the class                                | <b>.698</b>                       | .238                   | .077                 | -.003              | .174                   |
| 35. I use the real corporate cases for my homework                             | <b>.639</b>                       | .061                   | .049                 | .156               | .364                   |
| 36. The class covers the real field cases                                      | <b>.523</b>                       | .094                   | .073                 | .208               | .351                   |
| 37. I use my own strategy for the cyber education                              | .341                              | .127                   | .283                 | .217               | <b>.562</b>            |
| 38. I try to find the answer by myself   | .256                              | .028                   | .313                 | .178               | <b>.783</b>            |
| 39. I try to solve the solution by myself                                      | .251                              | -.019                  | .391                 | .138               | <b>.722</b>            |
| 40. I decided to enroll the college by myself                                  | .183                              | -.041                  | <b>.786</b>          | .135               | .136                   |
| 41. I choose the learning time by myself                                       | .202                              | -.040                  | <b>.845</b>          | .178               | .177                   |
| 42. I decide my work activity by myself  | .199                              | -.039                  | <b>.836</b>          | .196               | .206                   |
| 43. My learning is my choice   | .220                              | -.070                  | <b>.796</b>          | .188               | .210                   |
| Eigen Value  | 8.590                             | 3.872                  | 1.647                | 1.494              | 1.005                  |
| Variance Explained   | 34.36%                            | 15.49%                 | 6.59%                | 5.98%              | 4.02%                  |

The variables extracted by the factor analysis and their reliabilities are presented at the <Table 3>. The reliability presents are over .82 and all the variables are acceptable for the further study. The dependent variables are developed from the two phases. The first phase asks to the students for their satisfaction to the class. The next phase questions to the respondents about subjective learning achievement. The learning satisfaction variable is composed with

3 items and the subjective learning achievement is composed with 4 items. All the variables demonstrate acceptable reliability.

The components extracted by the factor analysis, the variables were defined by the mean values of components. Based on the acceptable output of reliability from table 3, the regression analysis of independent variables to the dependent variable was performed. The descriptive statistics are also presented at the <Table 3>.

〈Table 3〉 Reliability of the Research Variables and Descriptive Statistics

|                              | Reliability<br>(Cronbach's alpha) | Questionnaire<br>Items | N   | Min  | Max  | Mean | Std. Dev. |
|------------------------------|-----------------------------------|------------------------|-----|------|------|------|-----------|
| <b>Independent Variables</b> |                                   |                        |     |      |      |      |           |
| Community feeling            | .933                              | 8                      | 723 | 1.00 | 5.00 | 3.05 | 0.78      |
| Mutual interest and support  | .885                              | 6                      | 737 | 1.00 | 5.00 | 3.25 | 0.75      |
| Emotional connectedness      | .877                              | 4                      | 736 | 1.00 | 5.00 | 2.79 | 0.89      |
| Learning reality             | .887                              | 8                      | 720 | 1.88 | 5.00 | 3.66 | 0.58      |
| Collaborative learning       | .913                              | 5                      | 723 | 1.00 | 5.00 | 2.56 | 0.92      |
| Autonomy of learning         | .909                              | 4                      | 720 | 2.00 | 5.00 | 4.26 | 0.62      |
| Instructor utilization       | .781                              | 5                      | 723 | 1.80 | 5.00 | 3.70 | 0.58      |
| Self directed learning       | .824                              | 3                      | 720 | 1.33 | 5.00 | 3.79 | 0.62      |
| <b>Dependent Variables</b>   |                                   |                        |     |      |      |      |           |
| Learning satisfaction        | .896                              | 3                      | 718 | 1.00 | 5.00 | 3.80 | 0.69      |
| Learning achievement         | .918                              | 4                      | 718 | 1.00 | 5.00 | 3.79 | 0.66      |
| Cases (List wise)            |                                   |                        | 716 |      |      |      |           |

〈Table 4〉 Standardized Coefficients of Variables to the Learning Satisfaction

|                             | Social presence<br>model | Learning environment<br>model | Integrative<br>model |
|-----------------------------|--------------------------|-------------------------------|----------------------|
| Community feeling           | .256***                  |                               | .111*                |
| Mutual interest and support | .326***                  |                               | .112*                |
| Emotional connectedness     | -.150**                  |                               | -.038                |
| Learning reality            |                          | .306***                       | .280***              |
| Collaborative learning      |                          | .093**                        | -.008                |
| Autonomy of learning        |                          | .147***                       | .152***              |
| Instructor utilization      |                          | .214***                       | .184***              |
| Self directed learning      |                          | .121**                        | .105**               |
| Cases                       | 717                      | 717                           | 717                  |
| Adjusted R <sup>2</sup>     | .185                     | .442                          | .455                 |

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

The regression analysis was conducted to serve two purposes. The first purpose is to see the significant relationship among dependent variable of learning satisfaction and other independent variables. The relationship will define the key factors to affect the satisfaction of class. The second purpose is to investigate the relationship among learning achievement and independent variables including learning satisfaction. The first stage of analysis pres-

ents <Table 4>. The analysis shows that the integrative model increases the explanation capacity to the learning satisfaction. As the two constructs such as social presence and learning environment are independently developed, the conceptual notification may somewhat used interchangeably. This does not mean that the two model, social presence and learning environment concepts are exempt from the problem of multicollinearity.



&lt;Table 5&gt; Regression Analysis to the Learning Achievement in the Social Presence Model

| R   | R square                   | Adjusted R square | Standard error of estimation |        |      |
|---|----------------------------|-------------------|------------------------------|--------|------|
| .434 <sup>a</sup>   | .188                       | .185              | .597                         |        |      |
| Predictor : (constant), Community feeling, Mutual interest and support, Emotional connectedness |                            |                   |                              |        |      |
| Coefficient   |                            |                   |                              |        |      |
| Model 1   | Unstandardized coefficient |                   | Standardized coefficient     | t      | Sig. |
|   | B                          | Std. error        | Beta                         |        |      |
| (constant)  | 2.510                      | .102              |                              | 24.565 | .000 |
| Community feeling   | .220                       | .050              | .259                         | 4.412  | .000 |
| Mutual interest and support   | .285                       | .048              | .326                         | 5.936  | .000 |
| Emotional connectedness   | -.115                      | .042              | -.156                        | -2.732 | .006 |
| Dependent variable : Learning achievement   |                            |                   |                              |        |      |

&lt;Table 6&gt; Regression Analysis to the Learning Achievement in the Learning Environment Model

| R  | R square                   | Adjusted R square | Standard error of estimation |       |      |
|--|----------------------------|-------------------|------------------------------|-------|------|
| .683 <sup>a</sup>  | .467                       | .463              | .484                         |       |      |
| Predictor : (constant), Learning reality, Collaborative learning, Autonomy of learning, Instructor utilization, Self directed learning |                            |                   |                              |       |      |
| Coefficient  |                            |                   |                              |       |      |
| Model 2  | Unstandardized coefficient |                   | Standardized coefficient     | t     | Sig. |
|  | B                          | Std. error        | Beta                         |       |      |
| (constant)   | .219                       | .150              |                              | 1.462 | .144 |
| Learning reality   | .351                       | .044              | .305                         | 7.994 | .000 |
| Collaborative learning   | .093                       | .021              | .130                         | 4.353 | .000 |
| Autonomy of learning   | .151                       | .038              | .142                         | 3.913 | .000 |
| Instructor utilization   | .218                       | .039              | .192                         | 5.617 | .000 |
| Self directed learning   | .159                       | .041              | .150                         | 3.880 | .000 |
| Dependent variable : Learning achievement  |                            |                   |                              |       |      |

The dependent variable of learning achievement was analyzed in the social presence model. <Table 5> depicts the results of analysis. The social presence model demonstrates significant relationship to the all three social presence variables. The study articulates that the social presence model has a significant relationship with the learning achievement. <Table 6> presents the regression result of learning environment model. The model also shows significant relationship with the dependent variable. The result also demonstrates the logical reference of cyber learning achievement with the learning environment. <Table 7> presents the result of the regression analysis to the learning achieve-

ment in the social presence and learning environment model. The model integrates two approaches such as social presence and learning environment. When the two concepts were integrated, emotional connectedness variable was changed to be insignificant. <Table 8> demonstrates the comprehensive regression analysis of the research variables with the final dependent variable of learning satisfaction. The comprehensive model illustrates the significant variables to the learning satisfaction such as emotional connectedness, learning reality, and instructor utilization. The variable of learning satisfaction also has the significant relationship with the learning achievement.

<Table 7> Regression Analysis to the Learning Achievement in the Social Presence and Learning Environment Model

| R  | R square                   | Adjusted R square | Standard error of estimation |        |      |
|--|----------------------------|-------------------|------------------------------|--------|------|
| .689 <sup>a</sup>  | .475                       | .469              | .482                         |        |      |
| Predictor : (constant), Community feeling, Mutual interest and support, Emotional connectedness Learning reality, Collaborative learning, Autonomy of learning, Instructor utilization, Self directed learning |                            |                   |                              |        |      |
| Coefficient  |                            |                   |                              |        |      |
| Model 3  | Unstandardized coefficient |                   | Standardized coefficient     | t      | Sig. |
|  | B                          | Std. error        | Beta                         |        |      |
| (constant)   | .175                       | .150              |                              | 1.168  | .243 |
| Community feeling  | .071                       | .042              | .083                         | 1.671  | .095 |
| Mutual interest and support  | .085                       | .040              | .097                         | 2.089  | .037 |
| Emotional connectedness  | -.045                      | .035              | -.061                        | -1.277 | .202 |
| Learning reality   | .329                       | .044              | .287                         | 7.464  | .000 |
| Collaborative learning   | .048                       | .028              | .068                         | 1.708  | .088 |
| Autonomy of learning   | .153                       | .038              | .144                         | 3.984  | .000 |
| Instructor utilization   | .192                       | .039              | .169                         | 4.872  | .000 |
| Self directed learning   | .148                       | .041              | .139                         | 3.610  | .000 |
| Dependent variable : Learning achievement  |                            |                   |                              |        |      |

<Table 8> Regression Analysis to the Learning Achievement in the Social Presence and Learning Environment Model with Learning Satisfaction Variable

| R   | R square                   | Adjusted R square | Standard error of estimation |        |      |
|---|----------------------------|-------------------|------------------------------|--------|------|
| .689 <sup>a</sup>   | .475                       | .469              | .482                         |        |      |
| Predictor : (constant), Community feeling, Mutual interest and support, Emotional connectedness Learning reality, Collaborative learning, Autonomy of learning, Instructor utilization, Self directed learning, Learning satisfaction |                            |                   |                              |        |      |
| Coefficient   |                            |                   |                              |        |      |
| Model 4   | Unstandardized coefficient |                   | Standardized coefficient     | t      | Sig. |
|   | B                          | Std. error        | Beta                         |        |      |
| (constant)  | .138                       | .107              |                              | 1.292  | .197 |
| Community feeling   | .005                       | .030              | .006                         | .178   | .859 |
| Mutual interest and support   | .017                       | .029              | .020                         | .597   | .551 |
| Emotional connectedness   | -.026                      | .025              | -.036                        | -1.043 | .297 |
| Learning reality  | .108                       | .032              | .094                         | 3.330  | .001 |
| Collaborative learning  | .053                       | .020              | .074                         | 2.619  | .009 |
| Autonomy of learning  | .041                       | .028              | .038                         | 1.476  | .140 |
| Instructor utilization  | .048                       | .029              | .042                         | 1.682  | .093 |
| Self directed learning  | .067                       | .029              | .063                         | 2.288  | .022 |
| Learning satisfaction   | .663                       | .025              | .695                         | 26.365 | .000 |
| Dependent variable: Learning achievement  |                            |                   |                              |        |      |

The <Table 5> through 7 identifies that both social presence model and learning environment model have an important contribution for the learning achievement. However, the mechanisms to affect to the dependent variable are somewhat different. Social presence model depicts more

collaborative effect in the cyber learning situation. However, learning environment model emphasizes more individual mentality and attitude to the learning. <Table 8> integrated independent variables with another dependent variable of learning satisfaction. The reason for <Table

&lt;Table 9&gt; Standardized Coefficients of Regression Analysis to the Learning Achievement

| Variables                   | Social Presence Model | Learning Environment Model | Integrative Model | Comprehensive Model |
|-----------------------------|-----------------------|----------------------------|-------------------|---------------------|
| Community feeling           | .259***               |                            | .083              | .006                |
| Mutual interest and support | .326***               |                            | .097*             | .020                |
| Emotional connectedness     | -.156**               |                            | -.061             | -.036               |
| Learning reality            |                       | .305***                    | .287***           | .094***             |
| Collaborative learning      |                       | .130***                    | .068              | .074**              |
| Autonomy of learning        |                       | .142***                    | .144***           | .038                |
| Instructor utilization      |                       | .192***                    | .169***           | .042                |
| Self directed learning      |                       | .150***                    | .139***           | .063*               |
| Learning satisfaction       |                       |                            |                   | .695***             |
| Number of Cases             | 717                   | 717                        | 717               | 717                 |
| Adjusted R <sup>2</sup>     | .185                  | .463                       | .469              | .732                |

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

8> study is two folds. First, the dependent variable of learning satisfaction was actually measured by Likert scale in this study. The measured variable can be an independent factor. Secondly, and more importantly, the cyber education study emphasizes satisfaction as a key driver for the success of education. The level of satisfaction is a key driver for self directedness and the level of self directedness actually determines the educational performance.

The final results of regression analyses to the learning achievement are presented <Table 9>. Each model has its relevance and backup theories. This study also strengthens the traditional research agenda and stream. However, as the students of cyber education are diverse in their backgrounds, attitudes, and intention of study, the learning achievement model should be multifaceted and multilayered. The model started from the traditional social presence idea. The additional learning environment model was developed. After addressing the reliability and validity of variables, the integrative model was

analyzed. The integrative model suggests that the both the social presence idea and learning environment affects both learning satisfaction and learning achievement. The comprehensive model shows that even the learning satisfaction affects to the level of learning achievement.

## 5. Conclusions

This study intended to identify the relationships among social presence and learning environment variables with learning achievement in the cyber education settings. The research construct was based on the two relatively independent streams such as social presence model and learning environment model. These two ideas have common root of distance learning, in other words, cyber education. The study integrated two research agenda into one research construct of cyber learning satisfaction and achievement.

The result demonstrates that the ideas of social presence and learning environment are

quite independent but deeply related each other. When the variables of two constructs are integrated, the result shows each construct has its own variance. Even though some statistical limitations of common variances were inescapable, one construct is not completely deleted by the other by the statistical process of “partial out.” Social presence and learning environment concepts are both viable and quite important factor for the measuring the cyber educational performance.

Cyber education has been regarded as a part of information systems research. The system efficiency of e-learning and educational engineering point of view was the main approach of cyber education. This means that the supply side of e-learning has been counted so far. The students of cyber education are not education consumers anymore but turned to be education customers. The paradox of cyber education such as an increased level of technology led increasing needs for human touch makes a sense in this regard.

As the comprehensive model presents, the concept of learning satisfaction improves the level of learning achievement. The cyber education 2.0 requires learners’ satisfaction oriented system and structure.

As the results of the study demonstrate, future e-learning systems and contents need to equip with emotional factors among students and teachers. The contents oriented view of cyber education is outdated; rather relationship oriented view of cyber education is needed. Cyber education 2.0 is now entered. The 2.0 means more interaction oriented rather than the contents, more emotional related among students

and teachers rather than the instructor oriented, and more trendy learning contents for competitive cyber education rather than the traditional teaching materials.

The study does not go without its limitations. The first one can be considered as the common variance of the measurements. As the introduction proposed, the concepts of social presence contain the ideas of learning environment. Two constructs are not mutually exclusive but share some of the concepts. The final regression model pertains to its result. The comprehensive model does not present any significance from the social presence model variables where integrative model for learning satisfaction variable demonstrates the significance.

Secondly, the sample is drawn from the one institution. Even though the populations of respondents are from the various backgrounds and age groups, the educational implication from the single institution may have a potential biases. Finally, the questionnaire items from the published research articles are mainly from the English journals from American and British students’ research. Where the cultural factors are getting more consequences for e-learning research, the research constructs need to be modified to meet the Korean specific factors in e-learning environment.

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## ■ Author Profile

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Jihwan Yum

Jihwan Yum is a professor at Hanyang Cyber University where he teaches strategic management, e-business, organization theory, and other management

disciplines. Dr. Yum holds a DBA in strategic management from US International University, an MA in management from the University of Nebraska, Lincoln, and a BA in business from Hanyang University. His research area includes the relationship between information technology and organizational strategy, e-learning performance, and strategy typologies.