



## **Community of Inquiry and Perceived Learning: A Study of a Blended Learning Environment**

**Mohammad Hadi Zahedi\*, Ph.D.**

Director of E-Learning Center K.N Toosi University, Tehran, Iran

**Rouhollah Khodabandelou, Ph.D.**

Department of Education, Alzahra University, Tehran, Iran

**Golnar Mehran, Ph.D.**

Department of Education, Alzahra University, Tehran, Iran

---

### **Abstract**

The initial proposed the Community of Inquiry (COI) framework suggests that social presence, teaching presence, and cognitive presence are essential dimensions to promote successful learning experiences in higher education blended learning environments as educational model of the community of inquiry and its dimensions help educators to apply the findings of the research in practice. The objective of this quantitative study was to explore the relationship between three dimensions of community of inquiry and perceived learning among higher education students in a blended learning environment of Malaysian university. Descriptive method was the nature of this study. 150 blended learning higher education students were chosen through convenience sampling and surveyed. Two questionnaires were used to test the degree of students' perceived learning and the components of the community of inquiry model. The results of the study showed that there is statistically significant relationship between three dimension of community of inquiry and perceived learning. Moreover, the cognitive component is more predictive of the students' perceived learning.

**Keywords:** cognitive presence, Community of Inquiry (COI), distance learning, higher education, Malaysia social presence, teaching presence, perceived learning,

---

### **Introduction**

Currently emerging the information communication technology (ICT) has changed the concept of learning. The concept of learning has been implemented for innovative educational opportunities beyond conventional instructional approaches (Szeto, 2015; Wang & Huang, 2018). From this point of view learning is a very broad concept and should be narrowed down. It has been defined in different ways such as added knowledge, course withdrawals, successful completion of a course, and skill building even grades (Picciano, 2002). In the same token, students' learning has been measured by different ways as well. For example, Breslow (2007) summarize all measurements ways in two main categories

including direct and indirect methods. From Breslow (2007) via point, direct measures contain methods which provide more evidence of the increase in students' knowledge and abilities such as standardized tests, pre-post tests and grades. However, the indirect measures include alumni surveys graduation rates concept questions and surveys.

Laves (2010) and Rovai et al., (2004) noted that perceived learning is one of the indirect measures which has been identified as an alternative to using grades. Perceived learning has been commonly used to measure students' learning especially in distance education as a new generation of learning environments including online and blended. This concept has been defined in different ways Caspi and Blau (2008) believed that perceived learning is the set of beliefs and feelings one has regarding the learning that has occurred. A considerable amount of literature support that perceived learning is as good as other

---

\* Corresponding Author  
Email: zahedi@kntu.ac.ir

**Received:** 2018/16/10

**Accepted:** 2019/04/02

directs measures such as grades. For example, Corrallo (1994) indicated that perceived learning is actually more accurate measurement of actual cognitive change than grades. Moreover, McCroskey et al., (1996) assert students “generally have a good sense of what they learned;” therefore, it is acceptable to use students’ perception of learning as a measure of learning (p. 203).

In this regards, Szeto (2015) articulated that there are many models and frameworks that promote students’ perceived learning. One of them which has been widely adopted in studies of distance, online and blended learning is the Community of Inquiry (CoI) (Garrison, Anderson, & Archer, 2000). Over the past decade, considerable amount of literature have published based on the CoI framework (Majeski, Stover & Valais, 2018; Smadi, et al., 2019). Garrison et al (2000) suggested that this type of higher order and deep learning occurs through the interaction of three interrelated dimensions, including (a) Social Presence (SP), (b) Teaching Presence (TP), and (c) Cognitive Presence. All three dimensions are interrelated to each other and work together to promote students learning. Majeski et al (2018) articulated that the community of inquiry model identifies features which are central to a successful learning experience.

A recent review of Google Scholar lists over 4,884 citations to Garrison et al.’s (2000) article. However, there are some articles and evidence were criticized the CoI framework due to lack of empirical evidence that the framework leads to deep and meaningful perceived learning (Maddrell, 2011; Rourke & Kanuka, 2009). Furthermore, Richardson et al., (2012) suggested that distance learning deserve more serious and more rigorous study to identify the properties of successful learning environments. Based on the above problem statement main objective of the current study is to explore the relationship between three dimensions of community of inquiry and perceived learning among higher education students in a distance learning environment. Based on the objective of the study two following research questions were raised:

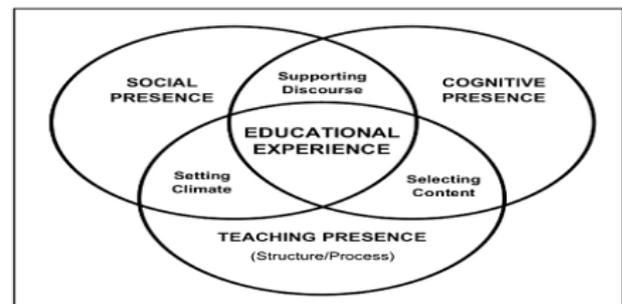
- What is the relationship between three dimensions of community of inquiry and perceived learning?
- Which dimensions of community of inquiry predict perceived learning more?

## Literature Review

After emerge of Internet and new generation of distance education technologies and in order to focus on higher order and deep learning, there has been designed and developed a considerable amount of

models and frameworks which attempt to promote student learning in this type of learning environments higher order learning. Focusing on students learning the community of inquiry has been investigated in numerous studies (Cohen & Holstein, 2018; Hilliard & Stewart, 2019; Kilis & Yildirim, 2018).

The CoI is a conceptual framework for the optimal use of higher order learning among higher education students in all type of distance learning environments (Maddrell, 2011). The framework in initially proposed by Garrison et al (2000) to support higher order and deep learning in distance education and learning environments. Figure 1 presents the CoI framework. Later it has been shown that the dimensions of the CoI can enhance the quality of learning (Maddrell, 2011). This framework is rooted in constructivism and its central assumption is that a valuable learning can be achieved through interaction of three presences including social, cognitive and teaching presence. However, Garrison (2003) argued that the successful learning occurs when there is a balance of these elements.



**Figure 1.**

The dimensions of Community of Inquiry (Garrison et al, 2000)

Social Presence (SP) as first element of the CoI is the ability of students to communicate with others emotionally and socially through communication platforms (i.e media) in order to form a community of learning (Garrison et al, 2000). Based on this initial definition it can be said that social presence is a “sense of belonging” to a community or group. So, it is clear that this dimension can help students to more active and feel themselves as a group of people. This dimension is more investigated by the researchers (i.e. Kim, 2011; Krish, Maros, & Stapa, 2012; Remesal & Colomina, 2013; Shen & Khalifa, 2008; So, 2006). Since it is an essential place to start considering a learning environment.

While Garrison et al (2000) defined Cognitive Presence (CP) is the extent to which learners are able

to construct and confirm meaning through sustained reflection and discourse (Garrison et al., 2000). This element is also more important since it is related to higher order such as critical thinking and meaningful learning. Furthermore, this element is more related to higher levels of thinking and learning.

Finally, Teaching Presence (TP) refers to the instructor role throughout his/her teaching and learning process (Huang, 2011). From this point of view the teaching presence is the mediator between social presence and cognitive presence. Since it is facilitate the process of students learning.

## Method

### Participants

150 undergraduate students from a Malaysian public university which offer distance education courses participant in this study. The design of the study was quantitative in nature and method was descriptive survey research. Two types of questionnaires were used as data collection tools. The gender composition of respondents was less balanced with 92 or 61% female respondents and 58 or 39% male respondents. Based on the questionnaire information, there were 81 (54%) students in semester three, 19 (12%) of them were in semester four, 28 (19%) of them were in semester five while only 22 (15%) of the respondents were in semester six. Furthermore, based on the questionnaire information, the majority of the respondents 58% were in education field, and the rest were from other field of study including Social Science and Humanities.

### Instruments

To test the degree of students' perceived learning in distance class, the items were modified from the CAP Perceived Learning Scale created by Rovai et al. (2009), and the perceived learning achievement scale (Kim, 2011). The questionnaire contains a seven-point Likert ranging from 0 = not at all to 6 = very much so. The Cronbach's Alpha coefficient was used to test internal consistency. Perceived learning construct was considered to be a reliable factor with an alpha level of 0.89. However, the degree of students' perceived learning scale was found to be a strong and highly reliable factor with an alpha level of 0.87.

The community of inquiry questionnaire contains three individual questionnaires to measure the three components of community of inquiry: social presence (19 items), teaching presence (23 items) and cognitive presence (23 items). On the other hand, the CoI scales measure students feel about how they are link together,

share knowledge, and work cooperatively in classes. These questionnaires were modified from Arbaugh et al., (2008), Shea and Bidjerano (2009), Garrison et al., (2010), and Kim (2011) for their research. High internal consistency were report for all dimensions with an alpha level 0.92 (SP), 0.92 (CP) and 0.97 (TP) respectively.

### Procedure

After specifying the instrument, since the aim of the study was to identify the predictor of perceived learning as well as the relationship between three dimensions of community of Inquiry including (social presence, cognitive presence and teaching presence) and perceived learning, the Perceived Learning Scale and the community of inquiry scale were administered to all the participants and then the data was analyzed using correlation coefficient, and ANOVA test.

### Findings

In order to examine the research questions of the study, two statistical measures were used. First, the descriptive statistics were used to show the means and the standard deviations. Second in order to investigate the relationship between students' perceived learning and THREE dimensions of community of Inquiry Multiple regression analysis was used. The goal of multiple regression to explore the relationship between one continues dependent variable (which is perceived learning here) and more than two independent variables (which are three here including social presence, teaching presence and cognitive presence).

According to Tabachnik and Fidll (2007), testing of assumptions usually involves obtaining descriptive statistics on one's variables. The means and standard deviations of each dependent and independent variables by are listed in Table 1.

**Table 1.**  
*Descriptive analysis of perceived learning and three dimensions of the COI*

	Mean	Std. Deviation	N
<b>Learning</b>	110.25	16.99	150
<b>TP</b>	86.09	11.61	150
<b>CP</b>	86.90	10.83	150
<b>SP</b>	70.17	9.18	150

For second statistical measure in the first step the statistical procedure used is Pearson Coefficient as it is an appropriate measure of relationship between variables. The correlations between the variables in the model are provided in the table labelled Correlational

Matrix between perceived learning and community of inquiry dimensions (Table 2). The table shows how much each independent variables is related to the dependent variable separately. Based on above discussion, community of inquiry including TP (0.55), CP (0.68), and SP (0.49) are correlated with perceived learning as dependent variable of the study. Hence, it can be concluded that community of inquiry dimensions seemed to have the most significant relationship towards perceived learning. The table below also shows the correlation among independent variables. The results show that CP and TP are correlated to each other (0.69). Meanwhile, SP and TP are less correlated to each other (0.60).

**Table 2.**

*Correlational Matrix between learning, Social Presence (SP), Teaching Presence (TP), and Cognitive Presence (CP)*

		Learning	TP	CP
<b>Pearson Correlation</b>	TP	0.626		
	CP	0.682	0.690	
	SP	0.494	0.603	0.699

To identify whether there exists a relationship between perceived learning and three dimension of community of inquiry the researcher needs to evaluate the model. The result found in Table 3 below shows that firstly, there is high degree of correlation between independent variables and depended variable ( $R=0.715$ ) and secondly, the table shows that 0.512 of the variance in the dependent variable (perceived learning) is explained by the model (which includes the variables of SP, TP, and CP). This means that the model (which includes SP, TP, and CP) explains 51.2 % of the variance in perceived learning (Table 3).

**Table 3.**

*Model summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.715 <sup>a</sup>	.512	.502	11.99270

To assess the statistical significance of the results, it is necessary to look at the table labelled ANOVA (Table 4). This model reaches the statistical significance ( $F(3, 2146) = 51.043$  Sig. = .000; when

$p < .0005$ ). It means that the regression model predicts the dependent variable significantly well.

**Table 4.**

*ANOVA*

Model		Sum Squares	of df	Mean Square	F	Sig.
1	Regression	22023.95	3	7341.31	51.04	.00.00
	Residual	20998.41	146	143.82		
	Total	43022.37	149			

Next, it is crucial to note that it was necessary to determine which of the variables included in the model contribute to the prediction of the dependent variable. This information can be found in Table 4. To compare the different variables, it is necessary to look at the standardized coefficients. The table shows that the values for each of the different variables have been converted to the same scale so that it can be compared. In this study, the researcher is interested in comparing the contribution of each independent variable. Therefore, the researcher uses the Beta values.

By studying the Beta column, it was confirmed which beta value is of the largest. In this case the largest beta coefficient is 0.498, which is for cognitive presence scale (Table 5). This means that this variable makes the significant contribution to explaining the dependent variable, when the variance explained by all other variables in the model is controlled for. In other words, it can be said that almost %50 of perceived learning is predicted by cognitive presence. While this value for teaching presence is almost %31. The Beta value for social presence scale was lower -0.038, indicating that it made less significant contribution.

For these variables, it is crucial to identify the value in the column marked Sig. This indicates whether this variable is making a statistically significant contribution to the equation. This is very dependent on which variables are included in the equation and how much overlap there is among the independent variables. Based on above considerations, the variables teaching presence and cognitive presence are making a significant contribution to the prediction of the dependent variable. However, it can be concluded that the variable social presence are making a less significant contribution to the prediction of dependent variable.

**Table 5.**  
*Beta value from coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	8.88	8.640		1.028	0.306	-8.194	25.957			
	TP	0.447	0.120	0.305	3.714	0.000	0.209	.684	0.626	0.294	0.215
	CP	0.780	0.144	0.498	5.431	0.000	0.496	1.064	0.682	0.410	0.314
	SP	-0.069	0.154	-0.038	-0.452	0.652	-0.373	.235	0.494	-0.037	-0.026

Another useful information in the coefficients table is the Part Correlation Coefficients (Table 5). It indicates that the total variance in the dependent variable is explained by that variable and how much R square would drop if it has not been included in the model. In this study, the STC scale has a Part Correlation Co-efficient of 0.09 indicating that STC explains 9% of the variance in total job satisfaction scores. For STW, the value is 0.168, indicating a contribution of 16 per cent to the explanation of variance in job satisfaction. Finally, for cognitive presence dimension the value is 0.410, indicating a contribution of 41% to the explanation of variance in perceived learning.

The results of the regression indicate that the community of inquiry is related to the perceived learning. This is explained almost by 51% of the variance ( $R^2 = 0.715$ ,  $F(3, 146) = 51.043$ ,  $p < .000$ ). It was found that three dimensions of community of inquiry have statistically significant relationship with perceived learning.

## Discussion and Conclusion

This preliminary study applied the CoI framework as an instructional approach in the context of distance learning environment. The results of study showed that there was statistically significant relationship between three dimensions of the community of inquiry and perceived learning in a blended learning environment. The finding of this study is in line with previous studies (Arbaugh, 2008; Cohen & Holstein, 2018; Garrison et al, 2010; Hilliard & Stewart, 2019; Huang, 2011; Majeski et al., 2018; Kim, 2011; Shea, & Bidjerano, 2009; Smadi et al., 2019; So, 2006). By supporting the previous studies the finding shows that the CoI is a useful theoretical tool to understand the relationships between its dimensions and perceived learning especially in blended learning environments. So, based on the framework and previous evidence in this area, there are empirical studies that show the three dimensions of the community of inquiry model

are interconnected and influence each other in order to promote the student's perceived learning.

Secondly, the results showed that the cognitive dimension is more predictive of the perceived learning rather than other dimensions. The results showed that almost %51 of variance is predicted by cognitive presence. This nation is in line with Bentz (2009) who indicated that cognitive presence is necessary in the establishment and maintenance of students' learning. To support this idea, we refer to Garrison and Arbaugh (2007) and Garrison and Cleveland-Innes, (2004) who indicated that cognitive presence is the most difficult element of the CoI framework to study and the most difficult element to develop in distance classroom. A possible explanation for this might be that cognitive presence is more related to the both students and lecturers since in cognitive presence student is attentive and actively processing or employing critical thinking skills (Garrison et al. 2010). Another possible explanation for this is that according to Arbaugh (2007,) cognitive presence has to be fostered through an instructor's role and students' interactions for construction of learning to occur.

This paper has investigated what is the relationship between community of inquiry dimensions and perceived learning in a blended learning context. Returning to the research questions posed at the beginning of this study, it is now possible to state that there is statistically significant relationship between dimensions and perceived learning. Moreover, current study has shown that cognitive presence is more predict the perceived learning. So, this study is significant in applying the CoI framework as an instructional approach. Majeski et al (2018) indicated that the community of inquiry approach provides a holistic line to teaching and learning. The findings of study support the assertion by Rourke and Kanuka (2009). Furthermore, the present study has provided additional evidence to the CoI and perceived learning as factors that contribute the distance learning environments success. The findings of the study also

provide support for the theoretical predictions of the CoI framework.

## Reference

- Arbaugh, J. B. (2007). An empirical verification of the Community of Inquiry framework. *Journal of Asynchronous Learning Networks*, 11(1), 73-75.
- Arbaugh, J. B. (2008). Does the community of inquiry framework predict outcomes in online MBA courses? *The International Review of Research in Open and Distance Learning*, 9(2), 1-21.
- Bentz, D. (2009). *Online and face-to-face classes: A comparative analysis of teaching presence and instructor satisfaction*. Unpublished Ph.D Thesis, University of Nebraska
- Breslow, L. (2007). *Methods of measuring learning outcomes and value added*. Retrieved 5 May, 2018, from <http://web.mit.edu/tll/assessment-evaluation/methods-of-measuring-learning-outcomes-grid.doc>
- Caspi, A., & Blau, I. (2008). Social presence in online discussion groups: testing three conceptions and their relations to perceived learning, *Social Psychology of Education*, 11(3), 323-346.
- Cohen, A., & Holstein, S. (2018). Analysing successful massive open online courses using the community of inquiry model as perceived by students. *Journal of Computer Assisted Learning*, 34(5), 544-556..
- Corrallo, S. (1994). *The progress of a study identifying the speaking and communication skills of graduate student*. Paper presented at the 1994 NCA summer conference proceedings and prepared remarks: Assessing college students competency in speech communication Armadale, VA.
- Garrison, D., & Arbaugh, J. (2007). Researching the Community of Inquiry framework: Review, issues, and future directions. *The Internet and Higher Education*, 10(3), 157-172.
- Garrison, D., & Cleveland-Innes, M. (2004). Critical factors in student satisfaction and success: Facilitating student role adjustment in online communities of inquiry. In J. Bourne & J. C Moore (Eds.), *Elements of quality online education: Into the mainstream* (pp. 47-58). MA: The Sloan Consortium.
- Garrison, D., Cleveland-Innes, M., & Fung, T. (2010). Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework. *Internet and Higher Education*, 13(1-2), 31-36.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105.
- Hilliard, L. P., & Stewart, M. K. (2019). Time well spent: Creating a community of inquiry in blended first-year writing courses. *The Internet and Higher Education*, 41(1), 11-24.
- Huang, H. (2011). *Assessing student perception of community of inquiry model through group collaboration via online and face to face instruction*. Unpublished PhD Dissertation, University of Idaho
- Kilis, S., & Yıldırım, Z. (2018). Investigation of community of inquiry framework in regard to self-regulation, metacognition and motivation. *Computers & Education*, 126(1), 53-64.
- Kim, J. (2011). Developing an instrument to measure social presence in distance higher education, *British Journal of Educational Technology*, 42(5), 763-777.
- Krish, P., Maros, M., & Stapa, S. (2012). Sociocultural factors and social presence in an online learning environment. *GEMA Online™ Journal of Language Studies*, 12(1), 201-213.
- Lewis, J. (2011). *The computer ate my classroom: Assessing student interactions, perceived learning, and satisfaction in online community college career technical education courses*, Unpublished Ph.D. Dissertation, University of Southern Mississippi.
- Maddrell, D. (2011). *Community of inquiry framework and learning outcomes*. Unpublished Ph.D Dissertation, Old Dominion University
- Majeski, R. A., Stover, M., & Valais, T. (2018). The Community of Inquiry and Emotional Presence. *Adult Learning*, 29(2), 53-61.
- McCroskey, J., Fayer, J., Richmond, V., Sallinen, A. & Barraclough, R. (1996). A multicultural examination of the relationship between nonverbal immediacy and affective learning. *Communication Quarterly*, 44(1996), 297-307.
- Picciano, A. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, 6(1), 21-40.
- Remesal, A., & Colomina, R. (2013). Social presence and online collaborative small group work: A socioconstructivist account. *Computers & Education*, 60(1), 357-367.
- Richardson, J.C., Arbaugh, J.C. Cleveland-Innes, M., Ice, P., Swan, K., & Garrison, D.R. (2012). Using the Community of Inquiry framework to inform effective instructional design. In L. Moller & J. Huett (Eds.), *The Next Generation of Education* (pp. 97-126). New York: Springer Publishing
- Rourke, L., & Kanuka, H. (2009). Learning in communities of inquiry: A review of the literature. *The Journal of Distance Education*, 23(1), 19-48.
- Rovai, A., Wighting, M., & Lucking, R. (2004). The classroom and school community inventory: Development, refinement, and validation of a self-report measure for educational research. *Internet and Higher Education*, 7(4), 263 – 280.
- Rovai, A., Wighting, M., Baker, J., & Grooms, L. (2009). Development of an instrument to measure perceived cognitive, affective, and psychomotor learning in traditional and virtual classroom higher education settings. *Internet and Higher Education*, 12, 7-13

27. Shea, P., & Bidjerano, T. (2009). Community of inquiry as a theoretical framework to foster “epistemic engagement” and “cognitive presence” in online education. *Computers and Education*, 52(3), 543–553.
28. Shen, K., & Khalifa, M. (2008). Exploring multidimensional conceptualization of social presence in the context of online communities. *International Journal of Human-Computer Interaction*, 24(7), 722-748
29. Smadi, O., Parker, S., Gillham, D., & Müller, A. (2019). The applicability of community of inquiry framework to online nursing education: A cross-sectional study. *Nurse education in practice*, 34(1), 17-24.
30. So, H. (2006). *Examining the relationships among collaborative learning, social presence and satisfaction in a distance learning environment*. Unpublished Ph.D Disertation, Indiana University, Indiana
31. Szeto, E. (2015). Community of inquiry as an instructional approach: What effects of teaching, social and cognitive presences are there in blended synchronous learning and teaching? *Computers & Education*, 81 (2015), 191-201.
32. Tabachnick, G. G., & Fidell, L. S. (2007). *Experimental Designs Using ANOVA*. Belmont, CA: Duxbury.
33. Wang, Q., & Huang, C. (2018). Pedagogical, social and technical designs of a blended synchronous learning environment. *British Journal of Educational Technology*, 49(3), 451-462.