# Establishing the Importance of Interaction and Presence to Student Learning in Online Environments

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*Abstract*

*With the growing trends in favor of online course offerings in higher education, it is important that researchers continue to focus on investigating the components vital to effectiveness. Using a survey design, the elements of interaction and presence, and their relationship and influence on student learning in an online course is examined in the current study. The findings of the study suggest that students perceive instructor-learner and learner-content interaction to be more important to their learning as compared to learner-learner interaction. In addition, teaching presence plays a more important role in student learning followed by cognitive presence and then social presence. Again, when it comes to the combination of the factors of interaction and presence, the factors that students perceive to have the most influence on their learning are teaching presence and learner-instructor interaction with the least important factor being learner-learner interaction. Overall, the results of this empirical study have implications for online course design and delivery to ensure student learning in online environments.*

*Keywords*

*online learning, interaction, presence*

## 1. Introduction

Data from Allen and Seaman's 2015 report indicate that the number of students taking at least one online course in U.S. colleges and universities currently stands at 5.2 million. While enrollment in online courses continues to expand, concerns for quality, rigor, and equivalence to traditional learning remain. Questions related to course structure, and levels of interaction and presence within online courses persist and continue to invite further inquiry into factors that encourage effective teaching and learning in online environments.

Two distance education theories, Transactional Distance (Moore, 1993) and Community of Inquiry (Garrison, Anderson, & Archer, 2000) have been advanced in the discussion of effectiveness of online courses. Transactional Distance theory postulates that online learning is most effective when the perceived pedagogical distance between the instructor and students in the course is minimized with

increased interaction; Interaction occurs through learner-instructor communication, learner-learner collaboration, and learner-content engagement. All three levels of interaction have important implications for effective online learning (Kennedy & Cavanaugh, 2008; Moore, 2007).

The Community of Inquiry theoretical framework focuses on the degree of presence in the online learning environment. Presence is vital to student success in online courses (Yuen, Deng, & Fox, 2009). There are three types of presence that must be maintained: 1. Social presence to increase learners' sense of community in the online environment; 2. Cognitive presence to enable learners to construct meaning from the online experience; and 3. Teaching presence to increase learner perception of the instructor's ability to provide structure and direction in the online environment (Garrison, Anderson, & Archer, 2000).

While the existence of both interaction and presence are known to be essential to online learning, the elements of both concepts have mostly been studied by researchers as separate entities or individual constructs. As such there is a lack of knowledge regarding the extent to which both constructs and all elements work simultaneously to effect online learning (Arbaugh, 2008). Knowledge of the effect of one construct at a time is insufficient; there is a need for empirical research that examines the relationship among the different elements of interaction and presence and student learning outcomes. Further studies in this area are warranted in order to gain a deeper understanding of how elements of interaction and presence influence course design and delivery to ensure optimal and quality online learning experience for students.

The purpose of this study is to examine the perceived importance of the elements of interaction and presence to student learning in an online methods course. The research questions addressed in the study are as follows: 1. How do students rate the elements of interaction and presence as being essential to their learning? 2. What is the nature of the relationship between the importance of the elements of interaction and presence to learning as perceived by the students in the course? 3. What is the combination of the elements that students perceive to be most essential or influential to their learning? The findings generated from this empirical study are significant for the design, implementation, and delivery of online courses. More specifically, the results help determine the most effective elements for maximizing learning in online courses.

## 2. Literature Review

The research on distance learning and online education has evolved over the last couple of years; from descriptions of the trends in online enrollments, to the types and structures involved in the delivery of online courses, and to a focus on understanding and developing theories related to teaching and learning in online environments. In particular, interaction and presence theories have been advanced to provide practitioners and scholars alike with a framework for effective teaching and learning online.

*2.1 Theory of Transactional Distance, the Nature and Levels of Interactions, and Teaching and Learning in Online Environments*

Distance education was first defined by Moore (1972) as "the family of instructional methods in which the teaching behaviors are executed apart from the learning behaviors so that communication between the learner and the teacher must be facilitated by print, electronic, mechanical, or other device" (p. 76). In this online environment in which instructors and learners are "set apart" by distance, three dimensions have been identified as important. These dimensions correspond to the dimensions of the structure of the teaching-learning processes in a course as set by the instructor, the nature of the instructional dialogue between the instructor and learners, and lastly the degree of autonomy or self-directedness displayed by the learners on "what to learn, how to learn, and how much to learn" (Moore, 2013, p. 68). Additionally, in this environment where "the interplay of teachers and learners have the special characteristic of their being spatially separate from one another", teaching and learning is more effective and works best when there is a "balance of structure and dialogue that is appropriate for a particular student population and subject field" (Moore, 2013, p. 71).

The theory of Transactional Distance presupposes that as the balance of structure increases and dialogue decreases, the transactional distance between the instructor and learners increases making for a less attractive course. A more attractive course or program is one in which there is "low structure and high dialogue i.e., low transactional distance, learners receive information and guidance through on-going dialogue with their instructors and through instructional materials that allow modifications to suit their individual needs, learning style and pace" (Moore, 2013, p. 73). Accordingly, a successful and more attractive course is one that offers student independence through less structure and more dialogue among the instructor and learners (Garrison & Akyol, 2013).

In line with the balance of structure, dialogue, and self-directedness, three levels of learner interactivity that support learning in online environments have been identified as interaction with content, the ability of learners to access, manipulate, synthesize, and communicate content information; interaction with instructors, the ability of learners to communicate with and receive feedback from their instructors, and interaction with classmates, the ability of learners to communicate with each other about content to create an active learning community (Moore, 1989 as cited by Swan, 2002, p. 24). The three modes of interaction function concurrently in practice to support learning; for example, interaction among students is facilitated by the instructor, and is directed in line with the content.

Instructor-learner interaction produces a perceived sense of connectedness between the instructor and the students. The benefits of ensuring adequate instructor-learner interaction include increased learning, motivation and achievement among students in the online course (Dennen, Darabi, & Smith, 2007; LaBarbera, 2013; Wlodkowski, 2010). Instructor-learner interaction can be obtained through the use of educational and synchronous and asynchronous media such as audio- and video-conferencing tools in the form of telephones, Skype, and other communicative tools. The degree of interaction is influenced by instructor frequency of contact, their regular presence in the course, and setting and meeting clear

expectations regarding such interactions or communications (Frisen & Kuskis, 2013).

Learner-learner interaction, a precursor for deep learning and important for collaborative and cooperative learning in the online course, may take various forms and occurs in four phases: greetings, gathering, activity, and conclusion (Lobel, Neubauer, & Swedburg, 2002; as cited in Frisen & Kuskis, 2013, p. 357). Learner interaction occurs in groups and takes place over computer networks. A transparent interface, frequent instructor interaction, and valued and dynamic communications and discussions among students make for good learner- learner interactions (Swan et al., 2001; Swan, 2002).

In the online environment, content is made available in the form of sound, text, graphics, video, and other multimedia. These materials supplement the instructor created study guides and learner interaction or engagement with the online course content remains central in distance education (Frisen & Kuskis, 2013). Overall, learner-content interactivity positively influences learning, satisfaction, and other outcomes.

Frisen and Kuskis (2013) also identified other forms of interaction beyond the levels suggested through Moore's framework of transactional distance. These include teacher-content interaction which aligns with the instructor's role of selection, development, and application of content online for student learning. With the rapid development of technology, instructors are now even more than before able to adapt pedagogical materials and resources from a variety of sources for teaching and learning. In the process, instructors have had the ability to interact with each other as a form of professional development and have also had the opportunity to be involved in document sharing to advance learning. Learner-interface interaction is another concept that lends itself to online learning. Online students in the process of learning, need to manipulate tools and materials to enable them accomplish a learning task or assignment (Hillman, Willis, & Gunawardena, 1994).

Building on Moore's (1989, 1993) description of transactional distance in online environments, Song and McNary (2011) learner-instruction aspect of interaction, through the utilization of Soller's (2001) Collaborative studied two of the three aspects of transactional distance, the learner-learner and Learning Conversation Skill Taxonomy (CLCST). This model displays a detailed structure of conversational skills that are most often exhibited in collaborative learning. The CLCST is based off the idea that "inter-dependence, accountability, promotive interaction, social skill, and group processing are necessary ingredients of a successful learning group" (Johnson & Johnson, 2005, p. 3). In particular, Song and McNary (2011) found that course design did influence the type and transformation of student posts over time. The particular course observed in the study required students to respond to a prompting question posed by the instructor to improve their understanding of various topics related to the class. Revealed through the CLCST coding system, the most common type of posts were "Inform-Suggest" and "Explain-Clarify" which were consistent with the course design and instructor expectations. In contrast, this research determined an absence of a strong correlation between the quantity of posts and students' overall course grade. The nonappearance of a relationship between the two variables measured could have been due to several limitations in the study. For instance, the class used in the research showed very little grade variation simply due to it being a graduate level course (Song &

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McNary, 2011). Additionally, recent literature concerned with interaction repeatedly stressed and analyzed student interaction in the context of participation in online group discussion activities (Ke & Kwak, 2013; Rodriguez, 2012; Schwier & Seatin, 2013). Student participation is often interchangeable with the concept of interaction described by Moore simply due to the fact that participation in an educational setting is often seen as students cooperating, communicating, and interrelating with one another, their teachers, or with the content directly.

Providing a setting to foster emotional connections and making sure content is meaningful and relevant are two elements of course design worth noting when it comes to promoting participation in an online learning environment (Schwier & Seatin, 2013). Schwier and Seatin made preliminary conclusions by investigating three types of online communication groups: formal, non-formal, and informal, where formal and non-formal were differentiated by whether participation was required or optional. An informal discussion group was characterized by open conversations, voluntary participation, and if conversation or prompts were left completely up to the participants. Particularly in a formal online educational setting, participation seemed to increase if the instructor was flexible and evoked "casual, personal, and learner-directed conversations within the directed, formal discussion activity" (Schwier & Seatin, 2013, p. 12). Not only does the type of online communication environment influence learner participation, but demographic qualities such as age, ethnicity, and education level determine participation and satisfaction levels (Ke & Kwak, 2013). According to this research, minority and highly educated learners tend to report positively on learner-learner interaction, as well as instructor-student contact, whereas their attitude regarding online distance education in general was unenthusiastic. Learners of a variety of ages appreciated and valued interaction within a multigenerational setting and minority groups reportedly felt included and accepted based on their cultural differences (Ke & Kwak, 2013).

*2.2 The Community of Inquiry Theoretical Framework, Presence, Building Community, and Teaching and Learning in Online Environments*

Although interaction in online courses can facilitate a sense of community (Shackelford & Maxwell, 2012), the occurrence of presence (a sense of being) is important for the attainment of higher order learning in the course. Presence is a necessary antecedent for the successful occurrence of interaction (Garrison & Cleveland-Innes, 2005) and has been shown to be critical to student success in online courses (Yuen, Deng, & Fox, 2009). For a successful course, three elements of presence must be developed: social, cognitive, and teaching presence. The development of these three elements is necessary for the process of creating a deep and meaningful collaborative and constructivist learning experience (Garrison & Akyol, 2013).

The three elements form the core of the framework of the theory of Community of Inquiry. Lipman (2003) argues the necessity of a community of inquiry for the operationalization of critical or reflective thinking. "An educational community of inquiry is a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual

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understanding" (Garrison & Akyol, 2013, p. 105). Garrison, Anderson and Archie (2000) constructed the Community of Inquiry framework "which was designed to capture the educational dynamic and guide the study of online learning effectiveness in higher education" (Garrison & Akyol, 2013). In fact, Armstrong and Thornton (2012) found by exploring the use of a synchronous discussion activity to an asynchronous graduate online degree program, all three types of presence were enhanced, contributing to a community of inquiry where students considered themselves "active participants in a cohesive community" (p. 6).

Of the three aspects of presence, social presence has gained popularity as an important aspect that make online learning effective as it aligns with the research on how people learn and social learning has been suggested to be the most effective way people learn (Vygotsky, 1978; Darling-Hammond & Bransford, 2007). Social presence is developed when relationships and a sense of belonging are generated in the online course. Social presence taps into the widely acceptable belief by Vygotsky (1978) and Sharan (1980) that interaction among learners is critical in learning and cognitive development. According to the social cognitive theory, social presence is a major vehicle for social learning (Tu, 2000). Social presence has emerged as an important "social factor" in the field of distance education (Jolivette, 2006) as online learning is sometimes considered a medium for social isolation and thus detrimental to group interaction (Crim & Reio, 2011; Gunawardena & Zittle, 1997).

The origins of social presence in learning could be traced back to Mehrabian's 1969 concept of immediacy in which "immediacy" was defined as "those communication behaviors that enhance closeness to and non-verbal interactions" ( p. 203). Social presence occurs when the learners are able to project themselves in the course as real people interacting with other members. Tapping into this definition, scholars have investigated, compared, and evaluated the effects of social interaction via various types of communication. Because some environments lack overt social cues, the concept of immediacy was understood by early researchers in terms of social presence. Short, Williams and Christie (1976) defined social presence as both a factor of the communication media and the level at which people involved in a transaction via media feel socially aware of each other and perceived social presence is an individual's sense of interpersonal relationship influenced by the interchange of verbal and non-verbal cues. From this perspective of social presence, some view it as a concept associated with emotional belonging (Wei & Chen, 2012). Therefore, learners in online environments need guidance on how to develop interpersonal relationships with other learning community members in a trusting environment to ensure a sense of social presence (Garrison et al., 2001). The ability to express and share ideas among learners and with the instructors trustingly promotes collaboration and deepens the learning experience. When social presence is established, collaboration, critical discourse, retention, and learning are enhanced and sustained (Garrison & Akyol, 2013).

McIsaac and Gunawardena (1996) defined the concept of social presence as the amount to which a person feels "socially present" in their environment (p. 408). More recent definition refers to social presence as "the degree of person-to-person awareness that occurs in a mediated environment" (Tu,

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2002, p. 34). Tu and McIsaac (2002) offer that "social presence is the degree of feeling, perception, and reaction to being connected by CMC" (p. 140) to another person through text. A simple definition offered by Biocca et al. (2003), a "sense of being with another" (p. 461), captures the main thrust of social presence; however this definition fails to capture other factors such as connectedness and community. Looking closely at past and present literature it is obvious that a standardized definition of social presence in online learning environments remains lacking. Since there is no standardized definition, most researchers studying social presence in online learning moved from trying to define the term to establishing an understanding of what social presence as a concept entails (Jolivette, 2006), therefore, it is important to understand what socialization and presence entails. According to Kanwar and Swenson (2002), socialization refers to the "process by which people learn the characteristics of their group and the attitudes, values, and actions thought appropriate for them" (p. 18). Jacobson (2001) described presence as "the sense of being caught up in the representation of virtual worlds" (p. 653). Jolivette (2006) argues that with these definitions in mind "one can see how the learner's perception of presence could affect their desire to socialize with peers" (p. 25), and how that affects the learner's comprehension or retention of knowledge (cognitive learning) as well as their feelings, attitudes, behavior and satisfaction (affective learning) with the course.

Though researchers could not define social presence, an understanding of the concept (of socialization and presence) as discussed above shows the importance of social presence. The battle is no longer about trying to define but exploring the nature of online learning environments that support social presence. The nature of online learning environments is analogous to the computer-mediated communication environment (Chang & Wang, 2008). Computer-mediated communication is broadly defined as any form of human interaction which occurs via information and communication technologies (Thurlow et al., 2004). Online classrooms achieve such asynchronous and synchronous interaction via learning tools such as discussion forums, message chats, electronic whiteboards, audio devices, and video devices for verbal and non-verbal communications (Wei & Chen, 2012). Mavroidis et al. (2013) explored the use of teleconferencing to influence social presence in a graduate level course within an open university. Students enrolled in the course perceived teleconferencing as a useful tool and the methods used for the study revealed a strong connection between perceived ease of use and the sense of community, social presence, and active participation.

It is important to note that mere integration of these tools in online learning do not promote social presence. There are other components that enhance and cultivate social presence such as; facilitation of discussion, sharing personal information, feedback and time, humor, and tone (Scollins-Mantha, 2008). Literature on social presence in online learning brings about one perspective, the notion that for learning to occur, learners have to feel a sense of community. However, there are other components and processes that matter to online learning which could interact with social presence to enhance learning in online environments.

One aspect that acts in concert with social presence to ensure learning is cognitive presence. Garrison

and Akyol (2013) define cognitive presence as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry" (p. 108). Cognitive presence requires student engagement in exploration, integration, resolution, and perception. In order to create cognitive presence, there is the need for teaching presence.

Teaching presence is seen as significant to the development of a sense of community among participants and presence was boosted when instructors took on a welcoming and accepting attitude towards students with varying levels of content and technological knowledge. Moreover, teaching presence was affirmed when instructors authenticated and added new information to student conceptions (Armstrong & Thornton, 2012).

Morgan (2011) goes further by determining that online learning, specifically online discussion spaces are not particularly standardized and instructors perceive and approach these communication spaces differently, which characterizes their teaching presence. With this particular research, Morgan (2011) emphasized the disconnect between online course designers and online course instructors when it comes to conceptions and uses of interactive spaces and suggest exploring more alternative methods to unify their approach to online learning.

Jones (2011) adds to the discussion on the importance of teaching presence in online learning by encouraging all three types of interaction (Kennedy & Cavanaugh, 2008; Moore, 2007) by making sure instructors utilize a variety of teaching methods and materials. The design of the course studied included online discussions boards and group projects, which effectively engaged students and nurtured a learning community where students felt accepted and listened to (Jones, 2011).

*2.3 Bringing Together the Concepts of Interaction and Presence*

The literature concerning the element of presence in online education largely concentrated on presence from the perspective of building a sense of community within the online learning setting, enabling participants to experience a community of inquiry, which has been firmly established in past research as a key element to online learning success (Armstrong & Thorton, 2012; Garrison, Anderson, & Archer, 2000; Garrison, Cleveland-Innes, & Fung, 2010; Jones, 2011; Redford & Naughton, 2002; Shackelford & Maxwell, 2012). Additionally, when reviewing the literature on elements of interaction and presence separately, two major themes emerged concerning the relationship of interaction and presence to student online learning: the collaborative process and the nature and level of interactions are both important for successful and significant learning to occur. While the literature suggests a strong link between the interaction and presence, the primary focus in the research to date tends to be on studying the two concepts of interaction and presence independently or separately rather than studying the influence of these two factors simultaneously. It remains to be seen how the elements of interaction and presence relate to each other and how they may be applied in online courses to increase learning. Further research in this area is definitely warranted.

### 3. Method

A survey research design as recommended by Creswell (2013) was applied in this study to determine the relationship between the level of interaction and presence, and the influence of the combination of these elements on student learning in an online course. The course of interest in this study is a foundational research methods course that is required for students enrolled in graduate programs at a large Midwestern university. The course covers the fundamentals of research design and students leave the course with knowledge and skill sets necessary for planning, conducting, and evaluating educational research.

According to Creswell (2013), survey research is used to provide descriptions of trends, attitudes, and opinions for a group of participants who represent a population. In this study, a survey was used to gather data on student perceptions of the elements of interaction and presence, and learning in the introductory graduate research methods course. The survey was administered to students enrolled in the online course over a period of one year; that is from summer 2013 to summer 2014. During that time period, eight sections of the online course were offered. Enrollment in these sections averaged about 18 students per section and across all the four semesters over which the study was conducted.

The survey used in this study comprised of 3 demographic questions, 4 ratings questions regarding the importance of the course to their learning, 33 Likert scale items constructed on a 1 = strongly disagree to 4 = strongly agree scale (14 assessing student perceptions of interaction and 19 assessing perceptions of Presence), and 2 open-ended items asking students to make recommendations on how best to improve interaction and presence in the course. The survey questions were developed based on past literature related to the theory of Transactional Distance theory and the Community of Inquiry framework and was administered to all students enrolled in the online course sections from summer 2013 to summer 2014. The survey was administered at the end of each semester and at the end of the course in order to prevent faculty-student coercion in data collection and also to ensure that student responses were not influenced by formative and summative grades awarded in the course.

Internal consistency estimates of reliability for the entire survey items yielded a Cronbach Alpha of 0.98 (Table 1). Item analyses were also conducted on the subscales of interaction and Presence. Coefficient alpha values were 0.96 for all 14 items measuring interaction and 0.98 for all 19 items measuring Presence. Analyses of each of the subscales items also revealed strong reliability indices. All reliability estimates meet the standard requirements of 0.70 and above as suggested by Green and Salkind (2014).

**Table 1. Cronbach Alpha Reliability Indices for Survey Subscales Items**

| Subscale | # of Items | Cronbach Alpha |
|---|---|---|
| Interaction | 14 | .96 |
| Instructor-Learner | 5 | .96 |

| | | |
|---|---|---|
| Learner-Learner | 5 | .88 |
| Learner-Content | 4 | .93 |
| Presence | 19 | .98 |
| Social Presence | 4 | .84 |
| Cognitive Presence | 7 | .97 |
| Teaching Presence | 8 | .96 |

Student data gathered from the survey was analyzed using Excel and Statistical Package for Social Sciences (SPSS). Student responses to the open-ended questions were coded and analyzed for themes. For the quantitative data, descriptive statistics such as means, standard deviation, and percentages were used to describe student perceptions of the elements of interaction and presence, and learning in the online course. Next, correlation analysis was conducted to examine the nature of the relationships among the elements of interaction and presence, and learning. Finally, regression analysis was conducted to determine the combination of elements of interaction and presence that students perceived to be most essential to their learning.

## 4. Result

*4.1 Students' Ratings of the Importance of the Elements of Interaction and Presence to Their Learning*

About 96 percent of the students indicated the online learning approach was important to their learning while 88 percent rated their overall experience in the course as being good to excellent. When asked to rank order the 3 levels of interaction according to the extent to which each of the areas were perceived to be essential to their learning, student ratings suggest a perception of instructor-learner interaction to be most important. Ratings of the three areas of interaction are presented in Table 2. The results show that the larger percentage (82%) of students rated instructor-learner interaction to be most/somewhat essential with an average rating of agreement of 3.64 (SD = 3.9) on a 4-point scale; followed by learner-content (71% and an average of 3.53). The ratings were least on learner-learner interaction (64% and an average of 3.42).

**Table 2. Student Ratings of the Subscales of Presence**

| Area of Interaction | Percent Ratings | | | Mean | SD |
|---|---|---|---|---|---|
| | Most Essential | Somewhat Essential | Least Essential | | |
| Learner-Instructor | 53% | 29% | 18% | 3.64 | .58 |
| Learner-Learner | 35% | 29% | 36% | 3.42 | .50 |
| Learner-Content | 53% | 18% | 29% | 3.53 | .54 |
| Overall | | | | 3.53 | .37 |

When it comes to presence, ratings were highest on teaching presence; 88% of students rated this area as being more/somewhat essential to their learning (Table 3). Ratings were lowest on social presence with 64% of the students indicating that this area was most to somewhat essential. Mean values across all three areas also reflect students rank orders (i.e., highest mean on Teaching Presence).

**Table 3. Student Ratings of the Subscales of Presence**

| Area of Presence | Percent Ratings | | | Mean | SD |
|---|---|---|---|---|---|
| | Most Essential | Somewhat Essential | Least Essential | | |
| Social | 35% | 29% | 36% | 3.37 | .57 |
| Cognitive | 47% | 24% | 29% | 3.37 | .66 |
| Teaching | 59% | 29% | 12% | 3.55 | .56 |
| Overall | | | | 3.45 | .46 |

*4.2 The Relationships among the Elements of Interaction, Presence, and Learning and Satisfaction with Their Learning*

Correlation analysis was conducted on the survey data to determine the extent to which the three learning elements of Interaction and Presence were related. Correlation coefficients obtained from analyses of the six element scales are presented in Table 4. All correlation values were significant at the 0.05 level. The results show correlation values that are positive and mostly moderate to strong in magnitude; ranging from .64 (the relationship between Learner-Learner Interaction and overall learning experience) to .97 (the relationship between Teaching Presence and Learner-Content interaction). The correlation values indicate that students who rated their learning experience higher also tended to rate the elements of interaction and presence consistently higher. In other words, the results suggest that in general, students who rated their learning experience highly also indicated or noted that the elements of interaction and presence, specifically learner-instructor interaction and Teaching Presence, were most important to their learning.

**Table 4. Interrelationships between Interaction, Presence, and Student Learning**

| Elements | Learner-Instructor | Learner-Learner | Learner-Content | Social Presence | Cognitive Presence | Teaching Presence |
|---|---|---|---|---|---|---|
| Learner-Instructor | - | | | | | |
| Learner-Learner | .74 | - | | | | |
| Learner-Content | .80 | .71 | - | | | |
| Social Presence | .80 | .90 | .74 | - | | |
| Cognitive resence | .81 | .79 | .88 | .81 | - | |
| Teaching Presence | .88 | .70 | .97 | .75 | .87 | - |
| Learning Experience | .77 | .64 | .58 | .70 | .70 | .77 |

*4.3 The Influence of the Combination of Elements of Interaction and Presence on Learning*

The elements of Interaction and Presence were regressed on students' rating of their learning experience using multiple regression analysis. The predictors were Learner-Learner interaction, Learner-Instructor interaction, Learner-Content interaction, Social Presence, Cognitive Presence, and Teaching Presence, while the criterion variable was learning experience. The linear combination of the predictors was significantly related to student learning experience, $F = 10.30$, $p < 0.05$. The multiple correlation coefficient was .93. All together the predictor variables explained 86% of students' ratings of learning. Results of the regression coefficients are presented in Table 5. The findings suggest the variable deemed most essential to learning in the online course is Teaching Presence ($\beta = 2.06$), followed by Learner-instructor interaction ($\beta = 2.04$). Learner-Learner Interaction ($\beta = .19$) appeared to be the least perceived to be influential to the students' learning.

**Table 5. Beta Coefficients for the Predictors of Interaction and Presence**

| Elements | β |
|---|---|
| Learner-Instructor Interaction | 2.04** |
| Learner-Learner Interaction | .19 |
| Learner-Content Interaction | .22 |
| Social Presence | .69* |
| Cognitive Presence | .49 |
| Teaching Presence | 2.06** |

*$p < 0.05$, **$p < 0.01$.

## 5. Discussion and Conclusion

As previously indicated, as enrollment in online courses continue to increase, it is important that instructors who teach online have a firm understanding of what might be important to ensure student satisfaction or high quality learning experiences in their courses. Student ratings of their learning experience in online courses have been positively connected with the overlapping elements of interaction and presence (Annand, 2011; Richardson & Swan, 2003). In addition, it is important to note that these interacting processes or relationships occur irrespective of students' level of performance in the course (Picciano, 2002). The elements of interaction and presence that have been connected with high quality learning experiences include: Learner-Instructor interaction, Learner-Learner interaction, Learner-Content interaction, Social Presence, Cognitive Presence, and Teaching Presence. In this study, on the average, students rated all six elements positively and deemed them essential to their learning experience. The results however suggest that the elements that appear to be most significantly essential to learning in the online environment are Teaching Presence, Learner-Instructor interaction, and Social Presence.

The results from a study by Ke (2010) confirmed that teaching presence is important in an online

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course. Teaching presence involves the extent to which the teacher is perceived to be present in the course, from the design of the learning materials to the encouragement of learning, fostering of collaboration, and directing student work (Rubin & Fernandes, 2013). In courses where the instructor appears to be present, student satisfaction or ratings of the quality of learning experience is more likely to be high. Teaching presence comprises of the number of teacher contacts in the course and is assessed as instructor saliency or productive online instructional effort (Shea, Hayes, & Vickers, 2010). With this definition, one gathers that students expect their instructors to demonstrate a high level of presence in the online course. Three subcategories that have been associated within teaching presence are: appropriate instructional design and organization of learning materials, appropriate facilitation of discussions online, and high quality direct instruction of the subject matter to students (Anderson, Rourke, Garrison, & Archer, 2001).

When it comes to the issue of Learner-Instructor interaction, Garrison et al. (2000) noted that student interaction with an instructor aids in establishing perceptions of teaching presence based on the design, organization, facilitation of discourse, and direct instruction provided by the instructor. Regarding the third element, Social Presence, Rubin and Fernandes (2013) described this as "the strength of the social relationships and emotional connection among the members of a class or learning community" (p. 119) and further point out that social presence has three elements: "identifying with a learning community, communicating openly in a trusting environment, and developing interpersonal relationships" (as cited in Garrison & Arbaugh, 2007, p. 119). Garrison et al. (2000) also described social presence as the projection of learners' personal characteristics into a community of inquiry through use of emotional expression, open communication, and various means to establish group cohesion. Akyol, Garrison and Ozden (2009) noted that social presence provides students with a means of collaboration and learning with and from each other. Teachers affect the degree of social presence by the way they design assignments, such as using group activities, as well as by teaching activities such as creating informal discussion areas, rewarding students for having discussions with one another, modeling openness and encouraging it among students, and through many other teaching behaviors (Rubin & Fernandes, 2013). In summary, course design, instructor behavior, and student characteristics all may affect student learning and therefore need to be thought out carefully by online instructors to ensure meaningful and significant learning among students in online environments.

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