

Relationships among Teaching, Social, and Cognitive Presence in Online Learning

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ABSTRACT

This study examines undergraduate students' perceptions of teaching, social, and cognitive presence in online learning environments, grounded in the Community of Inquiry framework (Randy Garrison & Jennifer Arbaugh, 2007). Despite extensive research on these constructs, limited attention has been given to how learners perceive their interrelationships within online contexts. A quantitative design was employed with a purposive sample of 239 undergraduates. Data were collected through an online questionnaire comprising four sections: demographic information, and measures of teaching presence (13 items), social presence (9 items), and cognitive presence (12 items). Responses were recorded using a five-point Likert scale ranging from "Never" to "Always." Descriptive statistics were used to determine perceived levels of each presence, while Pearson correlation analysis examined relationships among the constructs. Findings indicate that all three presences were perceived at moderate to high levels. Strong positive correlations were found between social and teaching presence ($r = .754, p < .001$), teaching and cognitive presence ($r = .779, p < .001$), and social and cognitive presence ($r = .804, p < .001$), indicating a high degree of interdependence. These results support the view that teaching, social, and cognitive presence function as an integrated system in online learning. The study provides empirical support for the CoI framework and offers practical implications for designing online environments that enhance interaction, instructional effectiveness, and cognitive engagement.

Keywords: Teaching presence, social presence, cognitive presence, online learning

INTRODUCTION

The rapid expansion of online learning in higher education has significantly transformed the way teaching and learning are designed and delivered. Following the COVID-19 pandemic, educational institutions increasingly relied on digital platforms to ensure continuity in teaching and learning. Although online learning offers flexibility, accessibility, and scalability, concerns remain regarding the quality of interaction, student engagement, and meaningful learning experiences in virtual environments. Learners often experience feelings of isolation, limited communication, and reduced opportunities for active knowledge construction, which may negatively affect learning outcomes. As a result, studies on digital communication, learner connection, and engagement have become increasingly important in educational research.

To better understand the effectiveness of online learning environments, the Community of Inquiry framework developed by Randy Garrison, Terry Anderson, and Walter Archer has been widely adopted. The framework identifies three interconnected elements essential for meaningful online learning: teaching presence, social presence, and cognitive presence. Teaching presence refers to the design, facilitation, and direction of learning

processes; social presence reflects learners' ability to establish social and emotional connections; while cognitive presence represents the extent to which learners are able to construct meaning through reflection and discourse.

Previous studies have highlighted the importance of these presences in shaping online learning experiences. Harati et al. (2025), for example, examined social presence in online discussion forums and found that strong student interaction positively contributed to engagement. However, the study focused mainly on asynchronous discussions and did not explore the role of teaching and cognitive presence. Similarly, Tan (2020) reported that inadequate infrastructure and limited online learning experience during the Movement Control Order (MCO) reduced students' social presence and motivation. The findings suggest that learners' online experiences cannot be fully understood without considering the role of instructors and teaching presence. In another study, Kucuk and Richardson (2019) investigated the relationships among teaching, social, and cognitive presence, engagement, and satisfaction among online learners. Their findings revealed that teaching presence was the strongest predictor of student satisfaction compared to social presence.

Although existing studies provide valuable insights into online learning experiences, many have examined teaching, social, and cognitive presence separately or focused mainly on their individual effects. Limited research has explored the interrelationships among these presences collectively within a single online learning environment, particularly in the Malaysian higher education context. Understanding these relationships is important because the CoI framework proposes that meaningful online learning emerges through the interaction of all three elements rather than from any single presence alone.

Therefore, this study aims to investigate undergraduate students' perceptions of teaching, social, and cognitive presence and examine the relationships among these constructs in online learning environments.

Objective of the Study and Research Questions

This study is done to explore the perception of learners on types of presence in online learning. Specifically, this study is done to answer the following questions;

RQ1: How do learners perceive teaching presence in online learning?

RQ2: How do learners perceive social presence in online learning?

RQ3: How do learners perceive cognitive presence in online learning?

RQ4: Is there a relationship between all types of presence in online learning?

LITERATURE REVIEW

Connectivism and Presence in Online Learning

Connectivism explains learning as a process of forming connections within digital networks, where knowledge is distributed across people, resources, and technologies (Khatibi & Fouladchang, 2015; Yusof et al., 2013). In online learning environments, learners interact with peers, instructors, and digital resources to construct meaning collaboratively. Unlike traditional learning theories that emphasize individual knowledge acquisition, connectivism highlights participation, interaction, and networked learning as essential components of the learning process. However, critics argue that connectivism focuses heavily on technological connectivity while providing limited explanation of how meaningful engagement and deep learning are sustained in online environments. This limitation suggests the need for complementary frameworks that explain the quality of interaction and learning experiences more comprehensively.

In this regard, the Community of Inquiry framework provides a more structured understanding of online learning through three interconnected elements: teaching presence, social presence, and cognitive presence. Teaching presence refers to the design and facilitation of learning activities, social presence concerns learners' ability to establish social and emotional connections, while cognitive presence involves constructing meaning through

reflection and discussion. Together, these elements explain how meaningful online learning experiences can be developed beyond simple technological interaction.

Drawbacks of Online Learning

Although online learning offers flexibility and accessibility, researchers have identified several challenges related to interaction and engagement. The absence of face-to-face communication may lead to learner isolation, reduced motivation, and limited opportunities for meaningful collaboration (Kangwa et al., 2024; Keengwe et al., 2012). Instructors may also struggle to monitor students' understanding and engagement due to limited non-verbal cues and delayed feedback.

However, these challenges are not solely caused by the online environment itself. Existing studies often focus on technological limitations while overlooking the role of instructional design and facilitation in shaping learners' experiences. This suggests that ineffective online learning may not simply result from the digital medium, but from the lack of strong teaching, social, and cognitive presence that supports meaningful interaction and engagement.

Advantages of Online Learning

Online learning provides flexibility, accessibility, and opportunities for self-directed learning, allowing students to access educational resources regardless of time and location (Plaza et al., 2023). Researchers have also highlighted its potential to support collaboration, interaction, and access to diverse learning materials (Collazos et al., 2021). In addition, social presence has been found to reduce feelings of isolation and enhance learner engagement in online environments.

Nevertheless, the effectiveness of online learning depends not only on technological access but also on the quality of interaction among learners and instructors. While many studies emphasize the advantages of online learning, some tend to assume that access to technology automatically leads to effective learning experiences. In reality, meaningful learning requires active facilitation, communication, and engagement. Therefore, the success of online learning depends largely on how teaching, social, and cognitive presence are established and maintained within the learning environment.

Understanding Presence in Online Learning

The concept of presence is central to understanding the effectiveness of online learning. Within the Community of Inquiry framework, teaching presence, social presence, and cognitive presence work together to support meaningful learning experiences. Teaching presence structures and facilitates learning, social presence fosters trust and interpersonal connection, while cognitive presence encourages critical thinking and knowledge construction.

Although these presences are commonly presented as equally important, existing literature suggests that teaching presence may play a more foundational role in shaping the overall learning experience. Without effective instructional design and facilitation, opportunities for meaningful social interaction and deeper cognitive engagement may remain superficial. Furthermore, many studies discuss these presences independently, despite the CoI framework emphasizing their interdependence. As a result, the dynamic relationships among teaching, social, and cognitive presence remain insufficiently explored, particularly from learners' perspectives in authentic online learning contexts.

Past Studies

Previous studies have consistently reported that social presence contributes positively to student engagement, collaboration, satisfaction, and academic performance in online learning environments (Johnson et al., 2022; Smith & Lee, 2021). These findings suggest that learners are more likely to participate actively when they feel socially connected to their peers and instructors. However, many of these studies focus primarily on interaction

outcomes and provide limited discussion on how social presence interacts with teaching and cognitive presence collectively.

Similarly, studies on teaching presence indicate that effective instructional design, facilitation, and feedback significantly enhance learner engagement and satisfaction (Garcia et al., 2023). Wang and Chen (2024) further found that strong teaching presence supports higher levels of cognitive presence by encouraging reflection, discussion, and critical thinking. These findings imply that teaching presence may function as an enabling factor that shapes both social interaction and cognitive engagement in online learning environments.

Despite these findings, existing research remains limited in several ways. Many studies examine teaching, social, and cognitive presence separately rather than investigating their interconnected relationships within a single framework. In addition, much of the literature focuses on Western or general higher education settings, with comparatively limited attention given to the Malaysian higher education context. Therefore, further research is needed to examine how undergraduate students perceive teaching, social, and cognitive presence collectively and how these constructs relate to one another in online learning environments.

Conceptual Framework

Figure 1 shows the conceptual framework of the study. This study is rooted in Garrison & Arbaugh's (2007) types of presence for online learning. They believe that learners need social, teaching and cognitive presence in online learning. Just like any other type of learning, students participating in online learning need satisfaction, attention, and relevance to feel confident in their learning (Rahmat,et.al., 2021). Social presence refers to the degree to which learners feel personally connected and engaged with their peers and instructors throughout the learning process. Cognitive presence refers to the degree to which learners actively construct meaning and engage in critical thinking. This is done through interactions with the course content and peers. Teaching presence refers to the degree to which an instructor actively engages with the students. He/she also facilitates interactions during online sessions. This study also explores whether there is a relationship between social presence and teaching and cognitive presence.

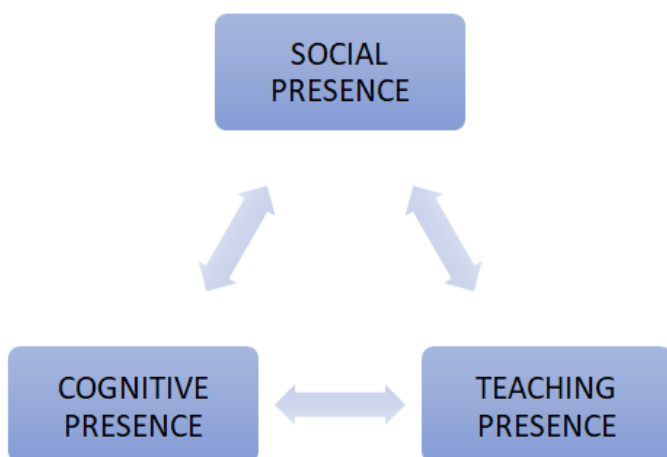


Figure 1- Conceptual Framework of the Study-

The Influence of Social Presence on Teaching and Cognitive Presence

METHODOLOGY

This quantitative study explored undergraduate students' perceptions of teaching, social, and cognitive presence in online learning environments. A purposive sampling technique was employed, involving 239 undergraduate students from Malaysian higher education institutions who had prior experience participating in online learning. Data were collected through an online questionnaire distributed via Google Forms. The online learning environments experienced by respondents included platforms such as Google Meet, Microsoft Teams, and institutional learning management systems.

Participation in the study was voluntary, and respondents were informed that their responses would remain anonymous and confidential. Informed consent was obtained before participants completed the questionnaire.

Table 1- Likert Scale

1	Never
2	Rarely
3	Sometimes
4	Very Often
5	Always

The instrument used is a 5 Likert-scale survey and is rooted from Garrison & Arbaugh (2007) to reveal the variables in table 1 below. The survey has 4 sections. Section A has items on demographic profile. Section B has 13 items on Teaching Presence. Section C has 9 items on Social Presence. Section D has 12 items on Cognitive Presence.

Table 2- Distribution of Items in the Survey

SECTION	TYPE OF PRESENCE	NO OF ITEMS	CRONBACH ALPHA
B	TEACHING	13	.959
C	SOCIAL	9	.911
D	COGNITIVE	12	.959
Total No. of Items		34	.975

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .959 for teaching, .911 for social and .959. The overall Cronbach alpha for all 34 items is .975, indicating good reliability of the instrument. Further descriptive analysis using SPSS is done to present findings to answer the research questions for this study.

FINDINGS

Findings for Demographic Profile

Table 3- Percentage for Demographic Profile

Question	Demographic Profile	Categories	Percentage (%)
1	Gender	Male	64%
		Female	36%
2	Cluster	Science & Technology	65%
		Social Sciences & Humanities	35%
3	Education Level	Foundation Level	18%
		Diploma Level	39%
		Degree Level	43%

Table 3 presents the percentage for the demographic profile. The majority of the respondents are from the Science and Technology cluster. 43% are at the degree level, followed by diploma level (39%) and foundation level (18%).

Findings for Teaching Presence

This section presents data to answer research question 1- How do learners perceive teaching presence in online learning? In the context of this study, teaching presence is measured by (i) design & organization, (ii) facilitation, (iii) direct instruction.

Table 4- Mean for (i) Design & Organization

ITEM	MEAN	SD
TPQ 1: The instructor clearly communicated important course topics.	4.5	.66016
TPQ 2: The instructor clearly communicated important course goals.	4.5	.69080
TPQ 3: The instructor provided clear instructions on how to participate in course learning activities.	4.5	.67907
TPQ 4: The instructor clearly communicated important due dates/time frames for learning activities.	4.6	.61018

Table 4 illustrates the mean for learners' views on teaching presence in terms of design and organization. Learners feel that an instructor's clear communication on important deadlines for learning activities is crucial [M=4.6]. In addition, it is also reported that learners also feel supported and engaged in online learning with clear mentions of course topics, course goals, and guidelines to take part in course learning activities [M=4.5].

Table 5- Mean for (ii) Facilitation

ITEM	MEAN	SD
TPQ 5: The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	4.5	.73214
TPQ 6: The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	4.5	.68407
TPQ 7: The instructor helped to keep course participants engaged and participating in productive dialogue.	4.5	.69736
TPQ 8: The instructor helped keep the course participants on task in a way that helped me to learn.	4.5	.63303
TPQ 9: The instructor encouraged course participants to explore new concepts in this course.	4.5	.69625
TPQ 10: Instructor actions reinforced the development of a sense of community among course participants.	4.5	.75591

Table 5 shows the mean scores for teaching presence by the facilitation of discourse. All items for this category are perceived as important, with M=4.5 for each. Participants view that the instructor was helpful in guiding discussions and interaction. These include identifying areas of agreement and disagreement and understanding about the subjects to help them learn and clarify their thinking. Besides, the instructor also helped learners to

have two-way communication by engaging and participating in productive dialogue. Learners are also encouraged to explore new concepts in the course and the instructor also allows them to develop a sense of community among their classmates.

Table 6- Mean for (iii) Direct Instruction

ITEM	MEAN	SD
TPQ 11: The instructor helped to focus the discussion on relevant issues in a way that helped me to learn.	4.5	.69062
TPQ 12: The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.	4.4	.75897
TPQ 13: The instructor provided feedback in a timely fashion.	4.4	.73952

Table 6 presents the mean scores and standard deviations for items related to Direct Instruction. The highest-rated item was TPQ 11, "The instructor helped to focus discussion on relevant issues in a way that helped me to learn," with a mean of 4.5 (SD = 0.69), indicating strong agreement among students regarding the relevance and effectiveness of instructional discussions. TPQ 12, which addressed the usefulness of feedback in identifying strengths and weaknesses, received a mean score of 4.4 (SD = 0.76). Similarly, TPQ 13, concerning the timeliness of feedback, also recorded a mean of 4.4 (SD = 0.74). These findings suggest that students generally perceived the instructor's guidance and feedback as timely, focused, and supportive of their learning.

Findings for Social Presence

This section presents data to answer research question 2: How do learners perceive social presence in online learning? In the context of this study, social presence is measured by (i) affective presence, (ii) open communication and (iii) group cohesion.

Table 7- Mean for (i) Affective Expression

ITEM	MEAN	SD
SPQ 1Getting to know other course participants gave me a sense of belonging in the course.	4.3	.77058
SPQ 2I was able to form distinct impressions of some course participants.	4.2	.77554
SPQ 3Online or web-based communication is an excellent medium for social interaction.	4.2	.90692

Table 7 shows the mean scores and standard deviations for items measuring Affective Expression. The highest mean was recorded for SPQ 1, "Getting to know other course participants gave me a sense of belonging in the course," with a score of 4.3 (SD = 0.77), indicating that students generally felt a sense of community in the online environment. SPQ 2, which assessed the ability to form distinct impressions of other participants, had a mean of 4.2 (SD = 0.78), suggesting moderate success in building interpersonal awareness. Likewise, SPQ 3, "Online or web-based communication is an excellent medium for social interaction," also received a mean of 4.2 but with a slightly higher standard deviation (SD = 0.91), reflecting more varied opinions on the effectiveness of online platforms for social engagement. Overall, the results suggest a positive perception of social connection and affective engagement in the online course.

Table 8- Mean for (ii) Open Communication

ITEM	MEAN	SD
SPQ4 I felt comfortable conversing through the online medium.	4.1	.90360
SPQ 5I felt comfortable participating in the course discussions.	4.2	.81579
SPQ 6I felt comfortable interacting with other course participants.	4.3	.78037

Table 8 presents the mean scores and standard deviations for the dimension of open communication. Overall, the findings indicate that respondents were generally comfortable communicating in the online learning environment. Among the items, "I felt comfortable interacting with other course participants" recorded the highest mean score ($M = 4.3$, $SD = .78037$), followed by "I felt comfortable participating in the course discussions" ($M = 4.2$, $SD = .81579$). Meanwhile, the item "I felt comfortable conversing through the online medium" obtained a mean score of 4.1 ($SD = .90360$). These findings suggest that students demonstrated a high level of comfort in engaging and communicating with others during online learning activities.

Table 9- Mean for (iii) Group Cohesion

ITEM	MEAN	SD
SPQ7I felt comfortable disagreeing with others course participants while still maintaining a sense of trust.	3.9	.99893
SPQ 8I felt that my point of view was acknowledged by other course participants.	4.1	.90557
SPQ 9Online discussions help me to develop a sense of collaboration.	4.2	.90085

Table 9 presents the mean scores and standard deviations for the dimension of group cohesion. The findings show that respondents generally demonstrated positive perceptions towards collaboration and trust in the online learning environment. The item "Online discussions help me to develop a sense of collaboration" recorded the highest mean score ($M = 4.2$, $SD = .90085$), indicating that online discussions contributed positively to collaborative learning. This was followed by "I felt that my point of view was acknowledged by other course participants" ($M = 4.1$, $SD = .90557$). Meanwhile, the item "I felt comfortable disagreeing with other course participants while still maintaining a sense of trust" obtained the lowest mean score ($M = 3.9$, $SD = .99893$), although the result still reflects a relatively positive level of group cohesion among participants.

Findings for Cognitive Presence

This section presents data to answer research question 3: How do learners perceive cognitive presence in online learning?

Table 10- Mean for (i) Triggering Event

ITEM	MEAN	SD
CPQ1 Problems posed increased my interest in course issues.	4	.89104
CPQ 2Course activities piqued my curiosity	4.1	.86051
CPQ 3I felt motivated to explore content-related questions.	4.3	.75145

Learners reported a notably positive perception of the "Triggering Event" phase of cognitive presence in their online learning experiences, indicating effective initial engagement. The mean scores illustrate that problems introduced within the course successfully heightened their interest in course-related issues ($M=4.0$, $SD=.89104$).

Furthermore, course activities were widely perceived as effective in stimulating curiosity ($M=4.1$, $SD=.86051$), and learners expressed a high degree of motivation to actively explore content-related questions ($M=4.3$, $SD=.75145$). These consistently high mean values underscore the success of the instructional design in initiating learners' cognitive processes and fostering an inquisitive mindset from the outset of the learning journey.

Table 11- Mean for (ii) Exploration

ITEM	MEAN	SD
CPQ 4I utilised a variety of information sources to explore problems posed in this course.	4.2	.82820
CPQ 5Brainstorming and finding relevant information helped me Resolve content-related questions.	4.3	.78179
CPQ 6Online discussions were valuable in helping me appreciate different perspectives.	4.2	.77660

The "Exploration" component of cognitive presence was also perceived very favourably by learners, reflecting their active and resourceful engagement with the course material. Participants indicated that they effectively utilised a diverse array of information sources to delve into problems presented in the course ($M=4.2$, $SD=.82820$). Critically, learners found that the processes of brainstorming and seeking relevant information significantly aided them in resolving content-related questions ($M=4.3$, $SD=.78179$). Moreover, online discussions were highly valued for their role in facilitating the appreciation of varied perspectives ($M=4.2$, $SD=.77660$). These findings collectively highlight that the online learning environment successfully supported learners in actively seeking, processing, and making sense of information, a crucial aspect of cognitive development.

Table 12- Mean for (iii) Integration

ITEM	MEAN	SD
CPQ 7: Combining new information helped me answer questions raised in course activities.	4.3	.75932
CPQ 8Learning activities helped me construct explanations/solutions.	4.3	.75895
CPQ 9: Reflection on course content and discussions helped me understand fundamental concepts in this class.	4.3	.75145

The mean scores for integration-related items from Table 12 indicate a high level of agreement among participants. Items CPQ 7, CPQ 8, and CPQ 9 all received mean ratings of 4.3, with standard deviations ranging from 0.751 to 0.759. These findings suggest that students strongly perceived the effectiveness of integrating new information to address course-related questions (CPQ 7), constructing explanations and solutions through learning activities (CPQ 8), and using reflection to grasp fundamental concepts discussed in the course (CPQ 9). The consistent mean scores reflect a positive perception of how these integration processes contributed to their learning experiences.

Table 13- Mean for (iv) Resolution

ITEM	MEAN	SD
CPQ 10I can describe ways to test and apply the knowledge created in this course.	4.2	.77877
I CPQ11 have developed solutions to course problems that can be applied in practice.	4.2	.78578
CPQ 12I can apply the knowledge created in this course to my work or other non-class related activities.	4.3	.73448

Table 13 presents the mean scores for the resolution phase, indicating generally high levels of agreement among respondents. Items CPQ 10 and CPQ 11 both recorded a mean of 4.2, while CPQ 12 had a slightly higher mean of 4.3. The standard deviations for these items ranged from 0.734 to 0.786, showing relatively low variability in responses. These results suggest that students felt confident in their ability to test and apply the knowledge gained from the course (CPQ 10), develop practical solutions to course-related problems (CPQ 11), and transfer their learning to work or other real-life contexts (CPQ 12). Overall, the findings highlight a strong sense of resolution and application among the participants.

Findings for the Relationship between all types of presence in online learning

This section presents data to answer research question 4: Is there a relationship between all types of presence in online learning?

To determine if there is a significant association in the mean scores between all types of presence in online learning, data is analysed using SPSS for correlations. Results are presented separately in tables 14, 15 and 16 below.

Table 14: Correlation between Social and Teaching Presence

		SOCIAL PRESENCE	TEACHING PRESENCE
SOCIAL PRESENCE	Pearson (Correlation	1	.754**
	Sig (2-tailed)		.000
	N	239	239
TEACHING PRESENCE	Pearson (Correlation	.754**	1
	Sig (2-tailed)	.000	
	N	239	239

Table 14 shows there is an association between social and teaching presence. Correlation analysis shows that there is a highly significant association between social and teaching presence ($r=.754^{**}$) and ($p=.000$). According to Jackson (2015), the coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between social and teaching presence.

Table 15: Correlation between Teaching and Cognitive Presence

		TEACHING PRESENCE	COGNITIVE PRESENCE
TEACHING PRESENCE	Pearson (Correlation	1	.779**
	Sig (2-tailed)		.000
	N	239	239
COGNITIVE PRESENCE	Pearson (Correlation	.779**	1
	Sig (2-tailed)	.000	
	N	239	239

Table 15 shows that there is an association between teaching and cognitive presence. Correlation analysis shows that there is a highly significant association between teaching and cognitive presence ($r=.779^{**}$) and ($p=.000$). According to Jackson (2015), the coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between teaching and cognitive presence.

Table 16: Correlation between Cognitive and Social Presence

		COGNITIVE PRESENCE	SOCIAL PRESENCE
COGNITIVE PRESENCE	Pearson (Correlation	1	.804**
	Sig (2-tailed)		.000
	N	239	239
SOCIAL PRESENCE	Pearson (Correlation	.804**	1
	Sig (2-tailed)	.000	
	N	239	239

Table 16 shows there is an association between cognitive and social presence. Correlation analysis shows that there is a highly significant association between cognitive and social presence ($r=.804^{**}$) and ($p=.000$). According to Jackson (2015), the coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between cognitive and social presence.

CONCLUSION

Summary of Findings and Discussions

This study explored learners' perceptions of teaching presence, social presence, and cognitive presence in an online learning environment, guided by the Community of Inquiry (CoI) framework. The results indicate that learners reported strong positive perceptions of teaching presence, particularly in the areas of design and organisation, facilitation, and direct instruction, with consistent mean scores of 4.4–4.6. Similarly, students viewed social presence positively, with affective expression, open communication, and group cohesion all receiving mean scores above 4.0, suggesting that learners felt a sense of belonging, comfort in communication, and collaboration within the course. Regarding cognitive presence, learners indicated high engagement across all four phases: triggering event, exploration, integration, and resolution—highlighting their motivation to explore content, integrate new information, and apply knowledge meaningfully. Correlation analyses further revealed strong and statistically significant positive relationships among all three presences: teaching and social presence ($r = .754$, $p < .001$), teaching and cognitive presence ($r = .779$, $p < .001$), and social and cognitive presence ($r = .804$, $p < .001$). These findings underscore the importance of a well-balanced presence across instructional design, interpersonal interaction, and cognitive engagement in supporting effective online learning experiences.

The strong relationships identified among teaching, social, and cognitive presence reinforce the interconnected nature of the Community of Inquiry framework. In particular, the strong correlation between teaching presence and cognitive presence suggests that effective instructional facilitation may play a crucial role in promoting learners' higher-order thinking and knowledge construction in online environments. This supports findings by Wang and Chen (2024), who reported that guided discussions and instructional support enhanced learners' critical engagement.

Similarly, the strong relationship between social and cognitive presence indicates that learners are more likely to engage meaningfully with course content when they feel socially connected and psychologically comfortable within the online environment. This finding aligns with Johnson et al. (2022) and Smith and Lee (2021), who emphasized the importance of social interaction in sustaining learner engagement and collaborative learning.

These findings collectively suggest that meaningful online learning is not solely dependent on technological access, but also on the instructor's ability to foster interaction, communication, and cognitive engagement simultaneously.

Limitations of the Current Research

This study has several limitations. First, the study employed a cross-sectional quantitative design, which limits the ability to determine causal relationships among the variables. Second, the use of purposive sampling may limit the generalisability of the findings to other higher education contexts. Third, the study relied on self-reported perceptions, which may be influenced by respondents' subjective experiences. Future studies may benefit from longitudinal or mixed-methods approaches to provide deeper insights into the development of teaching, social, and cognitive presence over time.

Implications and Suggestions for Future Research

Theoretical and Conceptual Implications

Theoretically, this study reinforces the relevance and applicability of the Community of Inquiry (CoI) framework in understanding online learning experiences. The high levels of perceived teaching, social, and cognitive presence, along with the strong correlations among them, provide empirical support for the framework's central claim that these three elements must work together to foster meaningful online learning. Conceptually, the findings extend the CoI model by demonstrating how each type of presence contributes to learner engagement and satisfaction in a real-world online learning context. The strong association between teaching and cognitive presence highlights the critical role of instructional design and facilitation in promoting higher-order thinking. Similarly, the link between social and cognitive presence suggests that interpersonal interactions are not just peripheral but central to cognitive development in virtual environments. This study thus adds to the growing body of literature that views online learning not only as a technological or instructional challenge, but as a socially and cognitively complex process that requires holistic and integrated pedagogical approaches.

Pedagogical Implications

The findings of this study suggest several important pedagogical implications for online teaching and learning. First, the consistently high ratings for teaching presence, particularly in design, facilitation, and direct instruction, underscore the need for instructors to set clear learning goals, provide structured content, and provide timely feedback. Effective instructional design that keeps students informed and engaged is essential for maintaining focus and supporting learning outcomes. Second, the strong correlation between social and cognitive presence underscores the importance of fostering a sense of community in online environments. Instructors should create opportunities for meaningful peer interaction and collaboration to help students feel connected and valued. Third, learners' positive perceptions of cognitive presence suggest that online activities should be designed to promote critical thinking, reflection, and real-world application. Strategies such as problem-based tasks and open-ended discussions can enhance cognitive engagement. Moreover, the significant relationships among all three presences emphasise the importance of a balanced approach, where teaching clarity, social connection, and cognitive challenge are integrated to support student motivation and performance. Lastly, these findings point to the need for professional development programs that equip educators with skills in online pedagogy, particularly in designing and facilitating courses that effectively cultivate all three types of presence.

Suggestions for Future Research

While this study provides valuable insights into learners' perceptions of teaching, social, and cognitive presence in online learning, several areas warrant further investigation. Future research could explore how these

perceptions vary across different learner demographics, such as age, academic discipline, or digital literacy levels, to determine if certain groups experience presence differently. Additionally, longitudinal studies could examine how perceptions of presence evolve and how they influence long-term learning outcomes, retention, or course satisfaction. Mixed-methods or qualitative approaches, such as interviews or focus groups, may also offer deeper insights into learners' personal experiences and interactions in online environments. Furthermore, future studies could investigate the role of emerging technologies such as AI, virtual reality, or adaptive learning systems in shaping or enhancing the three types of presence. Finally, comparative studies across different online platforms or institutional settings may help identify best practices for fostering effective online learning communities across various contexts.

Future studies should also investigate whether teaching presence mediates the relationship between social presence and cognitive presence through regression analysis or Structural Equation Modeling (SEM), as this may provide deeper insight into how meaningful online learning experiences are developed.

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