Investigating the Effects of Direct Instruction and Facilitated Discourse on Social and Cognitive Presence in Blended Learning

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Abstract
Community of Inquiry—a theoretical framework that consists of three interrelated elements: teaching presence, social presence, and cognitive presence—has been used widely in online and blended learning as an instructional design model to create and sustain conditions that facilitate meaningful learning in a learning community. Teaching presence is often regarded as the most important element for developing and maintaining social and cognitive presence and directing the community for purposeful learning. However, little is known about the effects of sub-dimension of teaching presence on social and cognitive presence. This study examined the effects of two components of teaching presence: direct instruction and facilitated discourse on social and cognitive presence in blended learning. Data was gathered from 466 blended learning students in higher education using the Community of Inquiry Survey. Results from structural equation modelling revealed that social presence has (i) a full mediating effect in the relationship between direction instruction and cognitive presence, and (ii) a partial mediating effect on the relationship between facilitated discourse and cognitive presence. The finding provides valuable insights into how direct instruction and the facilitation of discourse shape social and cognitive presence.

Keywords: Blended learning, community of inquiry, teaching presence, social presence, cognitive presence, facilitating discourse, direct instruction

Adam, M.S., Hamid, J.A., Khatibi, A., & Azam, S.M. (2025) Investigating the effects of direct instruction and facilitated discourse on social and cognitive presence in blended learning. *Online Learning, 29*(1), 89–107. DOI: https://doi.org/10.24059/olj.v29i1.4182

With the global spread of online and blended learning, one of the key challenges colleges and universities face is to ensure that online teaching compensates for the lack of face-to-face presence of lecturers, and that their online and blended courses have the same quality as the conventional face-to-face programs (Morueta et al., 2016; Rasheed et al., 2020; Zhang et al., 2016). The Community of Inquiry (CoI) theoretical framework (Anderson et al., 2001; Garrison et al., 2000, 2001) was developed to address challenges in developing meaningful learning experiences in online and blended learning environments (Moore & Miller, 2022). The CoI theoretical framework consists of three core elements—teaching presence, social presence, and cognitive presence—that interact and influence each other to create a learning community that supports worthwhile learning experiences. This study aims to explore how direct instruction and the facilitation of discourse influence both social and cognitive presence.

Research suggests that each of the three elements of the CoI framework significantly contributes to develop and sustain a functional community of inquiry (Aslan & Turgut, 2021; Guo et al., 2021; Law et al., 2019; Shea & Bidjerano, 2009). However, teaching presence is often regarded as the most important and crucial of the three CoI presences (Dempsey & Zhang, 2019; Martin et al., 2022), probably because the primary function of teaching presence is to play the lead role in creating and maintaining a favourable climate in the learning community for collaborative inquiry (Garrison, Cleveland-Innes, et al., 2010). Establishing and maintaining a purposeful community of inquiry in online and blended learning begins with teaching presence (Garrison & Cleveland-Innes, 2005; Stillman-Webb et al., 2023), and it provides leadership, structure, and guidance that binds learners and instructors as a learning community without their physical presence (Garrison & Cleveland-Innes, 2005). Teaching presence was shown to have significant influence on learner satisfaction, motivation, learning engagement, perceived learning, and sense of learning community (Adam et al., 2023; Garrison, 2007; Martin et al., 2022; Wang, 2022).

Teaching presence is defined as the design, facilitation, and direction of cognitive and social presence for the purpose of developing an effective learning experience (Garrison, 2007). Teaching presence consists of three sub elements; design and organisation, facilitated discourse, and direct instruction (Anderson et al., 2001). Design and organisation reflects the process of planning including setting the curriculum, designing learning activities, and establishing timelines; facilitated discourse focuses on establishing a learning climate, maintaining interest, motivation, and purposeful collaboration; and direct instruction provides information and direction to members of the learning community and ensures that individuals achieve the intended learning outcomes (Anderson et al., 2001; Caskurlu, 2018).

More than a decade ago, in an article that reviewed the issues identified from research on the CoI presences in learning communities, Garrison (2007) emphasised the importance of teaching presence for a functional community and the significance of the roles of facilitated discourse and direct instruction in online teaching. He argued that “the teaching presence must consider the dual role of both moderating and shaping the direction of the discourse.” Both the roles are crucially important for an effective community of inquiry (p. 69). Shea et al. (2006) found direct instruction and facilitated discourse together contributed the most to predicting a sense of community and learning. Given the importance of direct instruction and facilitated discourse in developing and sustaining an effective community of inquiry, it is of vital

importance to extend our understanding about the roles of direct instruction and facilitated discourse on creating social and cognitive presence. However, up to now, far too little attention has been paid to investigate the effects of direct instruction and facilitated discourse on forming and sustaining a community of inquiry. Hence, this study investigates the effects of direct instruction and facilitated discourse on social and cognitive presence.

Review of the Related Literature

Social Presence

Social presence is defined as the degree to which participants in a learning community feel connected to each other (Swan et al., 2009). Social presence consists of affective expression, open communication, and group cohesion (Garrison, Anderson, et al., 2010). Affective expression includes learners' sharing emotional expressions, feelings, beliefs, and values, and it reflects the emotional climate of the community and the acceptance of the individual as a member of the learning community; open communication refers to expression of ideas and opinions across the learning community, and it reflects purposeful nature of community; and group cohesion refers to sense of belonging, interaction and identification with other members of the learning community, and it reflects the collaborative nature of community (Akyol & Garrison, 2008; Dempsey & Zhang, 2019; Garrison, Anderson, et al., 2010; Swan et al., 2009). The purpose of social presence in a community of inquiry is to provide a climate for cognitive presence. According to Garrison (2007), "social presence is of less importance if the learning activities are information acquisition" and does not require collaborative inquiry (p.63). He argued that social presence should move beyond establishing socio-emotional presence and personal relationships and should create purposeful relationships to achieve educational objectives of the learning community.

The Mediating Effect of Social Presence on Cognitive Presence

The CoI framework aims to establish and sustain a learning community for a worthwhile educational experience. Within this framework, social presence plays a crucial role in binding learners into a purposeful community, providing the social means for collaboration and critical discourse necessary to achieve the educational objectives of the learning community. Social presence is a fundamental aspect of collaboration and critical discourse as it facilitates achieving cognitive objectives of learning by mediating critical thinking in a learning community (Mutezo & Maré, 2023). It provides a social, emotional, and collaborative learning climate through the development of interpersonal relationships among the members of the learning community (Annand, 2011). Thus, social presence acts as an essential antecedent for collaboration and critical discourse.

However, as posited by the CoI framework, social presence needs to be guided by teaching presence. It is unlikely that students' social interactions will naturally progress to purposeful educational engagement and critical discourse without such guidance. This conceptualization of the role of social presence is supported by several studies (e.g., Garrison & Cleveland-Innes, 2005; Li, 2022; Mutezo & Maré, 2023; Padmawidjaja et al., 2022; Shea & Bidjerano, 2009). According to these studies, social presence plays a mediating role in the relationship between teaching presence and cognitive presence.

Contrary to the findings that suggest the mediating role of social presence in the relationship between teaching presence and cognitive presence, Kozan (2016) argued that it was cognitive presence that influenced social presence, not the other way round. By comparing several possible models using structural equation modelling, Kozan (2016) demonstrated the possibility of two equally good structural equation models in terms of their fit indices—the first model included social presence as a partial mediator between teaching presence and cognitive presence, and the second one included cognitive presence as a full mediator between teaching presence and social presence. He concluded that it was cognitive presence rather than social presence that mediated the relationship, arguing that the model that included cognitive presence as full mediator between teaching presence and social presence was more parsimonious. More recently, Dempsey and Zhang (2019) re-examined similar models—in one model social presence was hypothesised to mediate the relationship between teaching presence and cognitive presence, and in the second model cognitive presence was assumed to mediate the relationship between teaching presence and social presence. They also found that the two models were equally good, supporting the finding of Kozan (2016). However, by referring to Kline (2015), Dempsey and Zhang (2019) argued that it would not be possible to derive a preferred model based on global fit indices criteria since the fit indices for all equivalent models will be the same. In structural equation modelling, the model preferred should be based on theoretical and conceptual grounds (Collier, 2020), and as Dempsey and Zhang (2019) argued, theoretically it makes little sense to view social presence as a response variable or intended outcome of the community of inquiry. The ultimate purpose of teaching and social presence is to enhance cognitive engagement, therefore, social presence can either be an independent variable or mediating variable.

Cognitive Presence

Cognitive presence is defined as the extent to which participants are able to "construct and confirm meaning through sustained reflection and discourse" (Garrison & Arbaugh, 2007, p. 161). The practical inquiry model by Garrison et al. (2001) illustrates how cognitive presence is operationalized into the four progressive phases of practical inquiry: triggering event, exploration, integration, and resolution. The first phase of practical inquiry—the triggering event—refers to identification of a problem or issue that needs to be resolved. The second phase—the exploration phase—involves exploring and gaining information regarding the identified problem through critical reflection and discourse. The third phase—the integration phase—involves constructing meaning from the information obtained in the exploration phase. The final phase—the resolution phase—involves selecting and testing the new knowledge to determine its suitability for resolving the identified problem. According to the practical inquiry model, reflection, structured collaborative interaction, and discourse are crucial for higher levels of cognitive presence and deep meaningful learning.

Cognitive presence is an important indicator of the quality of the learning experience in online and blended learning (Sadaf et al., 2021). Deep engagement in learning requires cognitive presence (Kucuk & Richardson, 2019). Cognitive presence indicates the extent to which learners are able to construct knowledge through interaction and guided discourse in the learning community, thus, it reflects the extent to which learning objectives are achieved (Gutiérrez-Santiuste et al., 2015). Learning results from integration of external interactions between the learner and the environment and an internal acquisition process involving cognition (Illeris, 2018). Thus, how meaningful one's learning experience depends on the level of cognition involved in the learning process.

The practical inquiry model elaborates the cognitive process in learning by demonstrating the key phases involved in the interaction between, what Illeris (2018) described as, the "shared and private world" of the learner. Therefore, in a community of inquiry, the primary purpose of teaching and social presence should be to enhance cognitive presence by providing and facilitating conditions required for practical inquiry. While teaching presence provides structure and leadership, social presence provides a condition for collaborative interaction and a suitable external environment for meaningful learning experience (Garrison, Cleveland-Innes, et al., 2010). Studies demonstrated that both teaching and social presence have significant impact on cognitive presence and learning (Gutiérrez-Santiuste et al., 2015).

Teaching Presence and Its Impact on Social and Cognitive Presence

In order to better understand the interactive and interrelated nature of the CoI presences and the role of teaching and social presence in developing and enhancing cognitive presence, it is important to note that the framework is based on social constructivist approaches to learning (Castellanos-Reyes, 2020; Garrison, 2007). Social constructivist theorists assert that learning is socially situated and knowledge is constructed as a result of social interaction. In this view, the process of learning works from outside in. A social constructivist approach reflects the importance of social context, the crucial role of communication, and collaboration in the learning process. The role of a teacher as a mentor and a facilitator is to create and use appropriate social context favourable for learning or constructing knowledge, and learning activities provided should be carefully planned and socially supported to stimulate both the social and inner processes of learning. Parallel to this perspective, the role of teaching presence in the community of inquiry theoretical framework is to regulate and bring together social and cognitive presence (Kreijns et al., 2014).

Teaching presence, which originates from course design and continues with what the instructor does to direct and facilitate learning, plays the leading role in developing and maintaining community climate. Existing research recognizes the crucial role played by teaching presence in establishing and maintaining community of inquiry (Shea et al., 2006; Shea & Bidjerano, 2009). Zhang et al. (2016) found that teaching presence has a significant positive effect on constructivist and interactive learning engagement. It has also been shown that teaching presence and its sub-constructs are crucial for establishing a community of inquiry and meaningful learning (Garrison & Cleveland-Innes, 2005a; Zilka et al., 2018). According to Vaughan et al. (2013); teaching presence brings together and directs social and cognitive presence to achieve educational objectives of the learning community. Evidence indicates student perception of teaching presence has a causal effect on social presence and cognitive presence (Garrison & Cleveland-Innes, 2005; Geng et al., 2019; Kozan, 2016; Kozan & Richardson, 2014; Law et al., 2019; Shea & Bidjerano, 2009). According to Wang (2022), sub-constructs of teaching presence explained 53% and 57% of cognitive and social presence respectively.

Direct Instruction and Facilitated Discourse

Once the design and organisation phase of a course is completed, and its implementation begins, teaching presence consists mainly of direct instruction and facilitated discourse. Direct instruction describes the role of instructor as the provider of intellectual and scholarly leadership through sharing subject matter knowledge with students (Anderson et al., 2001). Direct

instruction includes assessing the accuracy of student understanding, providing feedback in a timely manner, introducing new information, guiding discussions, and scaffolding construction of new knowledge (Garrison, Cleveland-Innes, et al., 2010; Zhang et al., 2016). Through direct instruction, the instructor helps students to focus on relevant issues, and to identify their strengths and areas of improvement in relation to their course objectives (Garrison & Arbaugh, 2007). The assessment and feedback are important components of direct instruction. Assessment informs direct instruction through diagnosing the needs of learners, and timely feedback guides learners towards achieving educational objectives. The other component of teaching presence, facilitated discourse, is conceptualised as the means by which the instructor facilitates students' interaction with subject matter provided and with each other for the purpose of developing personal meaning and understanding (Anderson et al., 2001). Through facilitated discourse, the instructor sets a climate for learning, helps students engage in discussions in a productive way, identify areas of agreement and disagreement, clarify their thinking with course topics, explore new concepts; facilitated discourse also reinforces student contributions (Anderson et al., 2001; Shea et al., 2006).

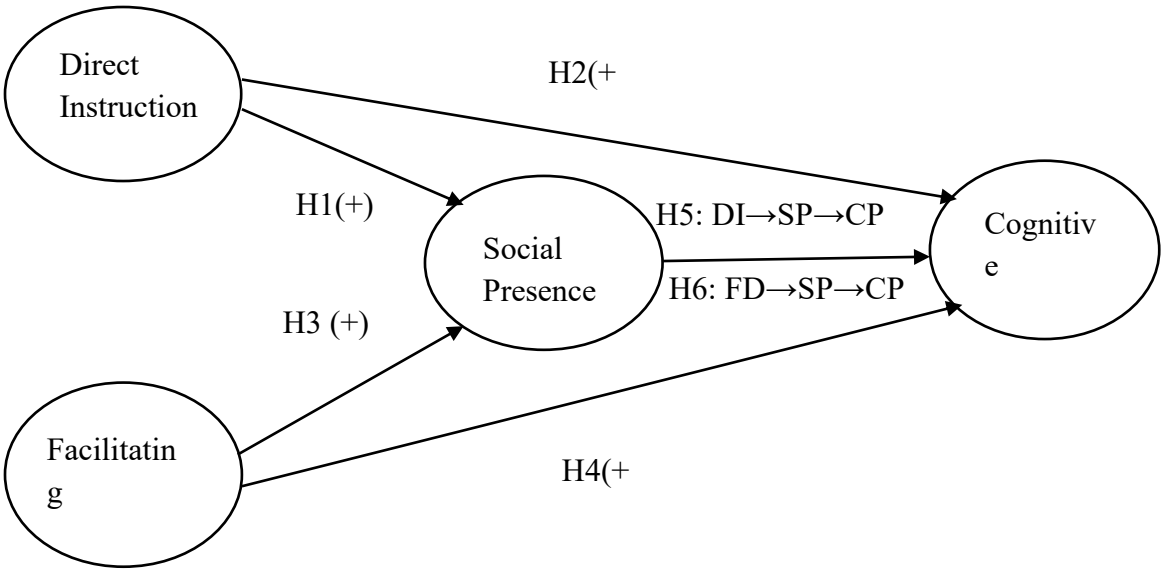
The CoI theoretical framework and existing research suggests that direct instruction and facilitated discourse will have positive influence on social and cognitive presence. According to Hosler and Arend (2012), direct feedback that is specific, timely, and encouraging, and facilitated discussions that keep students motivated and meaningful have strong influence on students' critical thinking. A qualitative analysis in a mixed-method study by Miller (2022) found that feedback—an indicator of direct instruction—provided by the instructor had a positive influence on student perceptions of social presence, however, the quantitative analysis of the study showed no significant change in student perceptions of social presence. In addition, Wang (2022), who examined the relationships among different dimensions of the CoI presences, found that facilitated discourse had a significant positive correlation with cognitive presence, as well as with social presence; direct instruction, on the other hand, exhibited a significant positive correlation with cognitive presence, but not with social presence. Overall, these studies suggest that both direct instruction and facilitated discourse play a role in developing social and cognitive presence in a learning community.

The Current Study

Drawing from the CoI theoretical framework (Anderson et al., 2001; Garrison et al., 2000, 2001) and existing research on the causal effect of teaching presence on social and cognitive presence (Dempsey & Zhang, 2019; Garrison, Cleveland-Innes, et al., 2010; Garrison & Cleveland-Innes, 2005b; Li, 2022; Moore & Miller, 2022; Mutezo & Maré, 2023; Shea & Bidjerano, 2009; Wang, 2022), this study developed the hypothesised model shown in Fig 1.

Figure 1

Hypothesised Structural Relationship Among Direct Instruction, Facilitating Discourse, Social Presence and Cognitive Presence



The study hypotheses were as follows:

H1: Direct instruction will have a positive direct effect on social presence.
H2: Direct instruction will have a positive direct effect on cognitive presence.
H3: Facilitated discourse will have a positive direct effect on social presence.
H4: Facilitated discourse will have a positive direct effect on cognitive presence.
H5: Direct instruction will have a positive indirect effect on cognitive presence through social presence.
H6: Facilitated discourse will have a positive indirect effect on cognitive presence through social presence.

Research Method

Participants

In this study, blended learning refers to an instructional model that integrates face-to-face and online learning, with over 30% of the content delivered online. The participants were students enrolled in blended learning courses from three higher education institutes in the Maldives. The inclusion criteria were continuing blended learning students who completed one semester of blended learning at the selected institutes. A total of 466 students from various disciplines including education, nursing, hospitality and tourism studies, and business and management participated in the study. The participants age ranged from 18 to 45 years, and 68% were females while 32% were males. The relatively large number of female students in the study was due to the high proportion of females in the study population at the time of data collection. According to the Ministry of Higher Education (2020), 64% of the total percentage of students pursuing higher education were female students during data the collection period.

Participation was voluntary with informed consents. Information about the study and invitation to participate were given through a faculty member and through online invitation with informed consent and the survey link. Table 1 provides demographic information of respondents of this study.

Table 1

Participant Demographics

Demographic Profile		Frequency (N=466)	Valid Percentage
Gender	Female	317	68%
	Male	149	32%
Age	Below 20	23	4.9%
	21-30	258	55.4%
	31-40	147	31.5%
	41 and above	38	8.1%

Measures

This study used the Community of Inquiry survey questionnaire (Arbaugh et al., 2008) to measure students' perception of direct instruction, facilitated discourse, social presence and cognitive presence. Participants responded to the questionnaire on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree) with a midpoint of neither agree or disagree.

Direct instruction was measured using 3 items (e.g., the lecturer helped to focus discussion on relevant issues in a way that helped course participants to learn), and facilitated discourse was assessed using 6 items (e.g., the lecturer helped the course participants in learning activities in a way that helped me to learn).

Social and cognitive presence were assessed using 9 and 12 items respectively. The social presence scale consists of 3 subcategories and each one of the subcategories was measured using 3 items. The subcategories were "affective expression" (e.g., I was able to form distinct impressions of some course participants), open communication (e.g., I felt comfortable participating in the course discussion), and group cohesion (e.g., I felt comfortable disagreeing with other course participants while still maintaining a sense of trust). Cognitive presence consists of 4 subcategories; each one was assessed using three items. The subcategories were triggering event (e.g., Problems posed increased my interest in course issues), exploration (e.g., I utilised a variety of information sources to explore problems posed in this course), integration (e.g., Combining new information helped me answer questions raised in course activities, and resolution (e.g., I have developed solutions to course problems that can be applied in practice).

Data Analysis

First, a preliminary analysis was conducted to prepare data for final analysis. Data was first checked for accuracy and suitability for analysis. Questionnaires with a large percentage of missing information and questionnaires with suspicious missing patterns—such as all extreme values—were not included in the analysis. The resulting sample included 466 students. The percentage of missing data was less than 2.5% and missing data was missing at random. According to Cokluk and Kayri (2011) when the missing data is small, missing data can be

treated with any treatment methods as the result will be similar. This study employed Expectation-Maximization method to estimate the missing data. After the missing data treatment, data was analysed for normality by examining Skewness and Kurtosis indices. All the Skewness and Kurtosis values were within acceptable range, suggesting no serious violation of the normality assumptions.

Second, confirmatory factor analysis containing both first order (direct instruction, facilitated discourse) and second order factor analysis (social and cognitive presence) was conducted to determine the factor structure of the measures via maximum likelihood estimation procedure using AMOS 20 software. Finally, structural relationships among the observed variables was examined using structural equation modelling. Along with the relative chi-square test, this study used fit indices (CFI, TLI, NFI, and IFI) suggested by Bentler and Benett (1980), and values greater than .90 are regarded as an acceptable fit. For the relative chi-square test, a value less than 3 is considered good (Kline, 2015). For the mediation analysis, this study examined the direct effect, and the indirect effect while controlling for the direct effect Hayes (2022), with a bootstrap sample of 5,000 as suggested by Collier (2020).

Results

The CFA results showed that the measurement model fits the observed data well and confirms the reliability and validity of the measures (relative chi-square test value = 1.427, CFI = 0.986, TLI = 0.984, NFI = 0.954, IFI = 0.986 and RMSEA = 0.030). As shown in Table 2, the factor loadings of items of direct instruction and facilitated discourse, and subconstructs of social and cognitive presence were all greater than 0.70. The average variance extracted (AVE) for each construct was greater than 0.50, indicating sufficient degree of convergent validity (Fornell & Larcker, 1981). Composite reliability values for the constructs were also greater than the accepted minimum of 0.70 recommended by Hair et al. (1998).

Table 2

Standardised Factor Loading, T-Values, and Composite Reliability of Measurement Scale

Construct	Standardised Factor Loading	t-value
Direct Instruction (CR=.867, AVE=0.685)		
– The lecturer helped to focus discussion on relevant issues in a way that helped course participants to learn	.904	19.081
– The lecturer provided feedback that helped me understand my strengths and weaknesses relative to the course goals and objectives.	.802	24.442
– The lecturer provided feedback in a timely fashion	.772	*
Facilitating Discourse (CR=.931, AVE= .691)		
– The lecturer was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn	.791	19.429
– The lecturer was helpful in guiding participants towards understanding course topics in a way that helped me clarify my thinking	.827	20.731

– The lecturer helped to keep course participants engaged and participating in productive dialogue.	.860	22.024
– The lecturer helped course participants on learning activities in a way that helped students to learn.	.866	22.214
– The lecturer encouraged course participants explore new concepts	.815	*
– Lecturer actions reinforced the development of a sense of community among course participants	.827	25.440
Social presence (CR=.862, AVE= 676)		
– *Affective Expression* items	.787	12.596
– *Open Communication* items	.818	15.176
– *Group Cohesion* items	.860	*
Cognitive Presence (CR=.929, AVE= .766)		
– *Triggering Event* items	.834	*
– *Exploration* items	.905	17.769
– *Integration* items	.913	18.215
– *Resolution* items	.845	15.030

*= Items constrained for identification purposes
C.R= Composite Reliability
AVE = Average Variance Extracted

The result of structural equation modelling showed that relative chi-square was 1.424, which is below the acceptable maximum of 3. The CFI, TLI, NFI and IFI (CFI = 0.986, TLI = 0.984, NFI = 0.954, IFI = 0.986) were all greater than 0.90. Similarly, the RMSEA was .030, which is below the acceptable maximum of .05. The coefficient of determination (R squared) values for the endogenous construct social and cognitive presence suggests that direct instruction and facilitating discourse explained 41% variance in social presence, and direct instruction, facilitating discourse and social presence contributes 69% in estimating cognitive presence.

Table 3
Results for Hypothesized Relationships

Hypothesised relationships	**Standardised estimates**	**t-values**	**P value**	**Results**
H1: Direct instruction → Social Presence	0.414	4.229	< .001	Supported
H2: Direct instruction → Cognitive presence	0.097	1.249	.212	Not supported
H3: Facilitating Discourse → Social Presence	0.253	2.678	<.01	supported
H4: Facilitating Discourse → Cognitive Presence	0.283	3.880	< .001	supported
Squared multiple correlation (R-squared)				

Social Presence	0.41
Cognitive Presence	0.69

The analysis of the structural model, as shown in Table 3, revealed that facilitated discourse had a significant positive direct effect on both social presence (H3) and cognitive presence (H4). The direct instruction had a significant positive direct effect on social presence (H1), however, the effect of direct instruction on cognitive presence was not significant (H2). The mediation analysis of structural models showed (see Table 4) that the indirect effects of direct instruction (H5) and facilitated discourse (H6) on cognitive presence through social presence were both significant. This implies that social presence acted as a full mediator in the relationship between direct instruction and cognitive presence and partial mediator in the relationship between facilitated discourse and cognitive presence.

Table 4
Results of Mediation Analysis

Relationships	**Direct effect**	**Indirect effect**	**Confidence interval**		**P value**	**Conclusion**
			Low	**High**		
Direct instruction → Social presence → Cognitive presence	0.097	0.228	0.115	0.381	$p < .001$	Full mediation
Facilitating discourse → Social presence → Cognitive presence	0.253	0.515	0.015	0.269	$p < .001$	Partial mediation

Discussion

Prior studies have investigated combined effects of sub-constructs of teaching presence on social and cognitive presence (Garrison, Cleveland-Innes, et al., 2010; Kozan, 2016; Kozan & Richardson, 2014; Li, 2022; Mutezo & Maré, 2023; Padmawidjaja et al., 2022) This study took a further step by investigating the effects of direct instruction and facilitated discourse of teaching presence on social and cognitive presence. The purpose of the study was to determine how direct instruction and facilitated discourse influence the development of social and cognitive presence. As mentioned earlier, it was hypothesised that direct instruction and facilitated discourse would influence social and cognitive presence, and the effect of direct instruction and facilitated discourse on cognitive presence would be mediated by social presence (Garrison, Cleveland-Innes, et al., 2010).

Effects of Direct Instruction on Social and Cognitive Presence

With regards to direct instruction, the finding suggests significant indirect effects on cognitive presence through social presence. This means that direct instruction helps students to feel a sense of belonging to the learning community and encourages social interaction which in turn helps them to engage cognitively and collaboratively to construct personal understanding and construction of knowledge. The finding is consistent with conceptualization of direct instruction as defined in the CoI theoretical framework and its role as "sustaining respect and responsibility (social) and inquiry through resolution (cognitive)" (Dempsey & Zhang, 2019, p. 65). The finding supports Shea et al. (2006) who confirmed that strong and active involvement of instructor in direct instruction and facilitated discourse is associated with students' sense of connectedness and learning, and Akyol et al. (2011) who found students' perception of direct facilitation is associated with higher level of learning and sense of learning community. Earlier research suggests that the instructor's ability to provide effective direct instruction (e.g., the instructor's ability to focus discussions on relevant issues and give feedback that help to understand) contributes significantly in their learning (Kupczynski et al., 2010). Overall, in addition to confirming the positive association of direct instruction with social and cognitive presence reported in previous studies, the current study contributes to the literature by revealing the direction of the relationship among these variables and identifying their roles in the relationship. The implication is that instructors aiming to facilitate cognitive presence through direct instruction should recognize the role of social presence in enhancing students' critical thinking and cognitive presence.

Concerning the direct effect, even though the study hypothesized that direct instruction would have a positive direct effect on cognitive presence, the results indicate that there was no significant direct effect from direct instruction to cognitive presence. This means the relationship between direct instruction and cognitive presence was fully mediated by social presence. The finding is consistent with the roles of direct instruction and social presence in a learning community. In a community of inquiry, the role of direct instruction is to provide scholarly guidance, where learning depends heavily on collaborative interaction among the members. The purpose of social presence is to facilitate learning by providing a favorable social climate for these interactions.

Prior studies indicated that teaching presence (the aggregate effect of course design, direct instruction, and facilitated discourse) had both direct and indirect effects on cognitive presence (Garrison, Cleveland-Innes, et al., 2010; Gutiérrez-Santiuste et al., 2015; Mutezo & Maré, 2023; Padmawidjaja et al., 2022). Since these studies investigated the combined effect of teaching presence factors on cognitive presence through social presence, their findings may not contradict the findings of the current study. In fact, the specific effect of each component of teaching presence can differ from the aggregate effect. Further studies could explore the difference between the specific effects of teaching presence and its combined effect on social and cognitive presence.

The study contributes to the literature by investigating the specific role played by direct instruction and revealing social presence as a full mediator between direct instruction and cognitive presence. The finding indicates that elements of direct instruction, such as presenting

content, asking relevant questions, focusing discussions on relevant issues, assessing learning, clarifying misconceptions and providing timely explanatory feedback, enhance students' social presence, which in turn contributes to a meaningful learning experience

Effects of Facilitated Discourse on Social and Cognitive Presence

The results of this study revealed that facilitated discourse had a direct effect on both social and cognitive presence. This suggests that actively encouraging and managing discussions and interactions among participants directly enhances students' ability to project themselves socially and emotionally in a community (social presence). It helps students feel more connected and engaged with each other, fostering a sense of belonging and interpersonal relationships. Facilitated discourse also promotes deeper thinking, critical analysis, and a better understanding of the material, thereby enhancing the overall learning experience (cognitive presence). The finding implies that when discussions are effectively guided, they not only improve the social dynamics within the group but also enhance intellectual engagement and learning outcomes.

The finding confirms Wang (2022) who demonstrated significant positive correlation between facilitated discourse and social presence and facilitated discourse and cognitive presence. The finding is also consistent with evidence from a number of earlier studies on facilitated discourse (Hosler & Arend, 2012; Kupczynski et al., 2010; Tathahira, 2020; Wang & Liu, 2020). Hosler and Arend (2012), for example, reported that students' perceived level of their critical thinking was positively associated with aspects of teaching, such as, relevant assignment, explanatory and timely feedback, and instructors' active involvement in facilitating discourse that keeps students focused and encourages participation at a meaningful level. Hosler and Arend (2012) argued that facilitating discourse is a "key to engendering critical thinking or cognitive presence" (p.219). These results suggest that in online learning, facilitated discourse is a useful means to encourage students to student interaction, interaction with learning materials, and engagement in collaborative construction of knowledge.

However, in previous research, the positive association between the instructor facilitating discourse and cognitive presence was not always evident. For instance, Costley (2015) compared the effects of three types of instructor posts on students' critical thinking—no instructor posting, posts with direct instruction, and posts that contain facilitated discourse—and found that lack of instructor posting and posting that contain facilitated discourse has no significant effect on students' critical thinking. One possible reason for this might be, according to Tathahira (2020), the use of teaching and learning methods that reflect instructor as the center of learning or the instructor being too dominant in teaching and learning activities. Nonetheless, a key feature that makes a blended or online learning environment more conducive to facilitate critical thinking or cognitive presence is its potential to incorporate student-centred and active learning, rather than time-limited teacher dominant traditional classroom. This suggests that although instructor facilitation is crucial for cognitive presence, teacher interaction should not show their monopoly on power.

Another important finding of this study, regarding facilitated discourse, is the indirect effect of facilitated discourse on cognitive presence through social presence. The finding validates the role of social presence as providing a social climate for inquiry. The finding supports the claim that facilitated discourse is required to maintain focus and engagement of

students in a collaborative learning environment (Anderson et al., 2001). Earlier research has shown that teaching presence has significant indirect effect on cognitive presence through social presence (e.g., Dempsey & Zhang, 2019; Garrison et al., 2010; Mutezo & Maré, 2023). This study adds to the literature by specifically revealing the role of social presence in the relationship between facilitated discourse and cognitive presence. Although, prior studies failed to look into possible indirect or mediating effect of social presence in the relationship between facilitated discourse and cognitive presence as such, evidence from studies such as Garrison and Cleveland-Innes (2005) suggests facilitating discourse is required in order to guide social presence to facilitate cognitive presence and learning, therefore, supporting the possible indirect effect of social presence in the relation between facilitated discourse and cognitive presence as found in this study. Garrison and Cleveland-Innes (2005) argued that social presence alone is not sufficient to stimulate cognitive presence. According to Garrison and Cleveland-Innes (2005), facilitating cognitive presence requires focused critical discourse. They suggest that it is instructor facilitation that guides social presence to stimulate critical thinking and facilitate cognitive process in learning. The finding of this study also supports the claim that facilitated discourse is required to maintain focus, and engagement of students in a collaborative learning environment (Anderson et al. (2001). This evidence suggests that instructor-led facilitation is essential for guiding interactions among learning community members, thereby enhancing social presence, cognitive presence, and meaningful learning.

Limitations

Despite noteworthy strengths, there are several limitations associated with this study. First, the study relied solely on self-reported measures. Although constructs related to human behaviour such as students' response and perceptions to their learning environment are best measured by self-reports (Howard, 1994), some scholars argues that the self-reports are prone to several kinds of response bias, and findings about correlational and causal relationships may be influenced by the problems of common method variance (Donaldson & Grant-Vallone, 2002). Second, the study sample was not a random sample. Invitation to participate in the study was sent to students who satisfied the inclusive criteria, and as participation was voluntary, those participating in the study may not be an accurate representation of the study population. Further research may be needed to generalise the findings. Moreover, the finding of this study by itself does not allow for the conclusion of causality or directionality between associated variables since structural modelling is not causal modelling. The hypothesised model of the study was based on CoI theoretical framework and prior research on the topic. The analysis of structural modelling only confirmed that the hypothesised model was a good fit to the data. An experimental or quasi-experimental model is needed to further confirm the causality between the associated variables. Another limitation is related to the fact that this study is conducted in a blended learning context with the focus on online learning components of blended learning. In a blended learning class, there is a clear feeling of human connection that significantly differs from a full online class. Therefore, future research should consider conducting similar investigations within fully online settings to provide a more comprehensive understanding of the effects of direct instruction on social and cognitive presence in online learning contexts

Conclusion

The present study confirms the significance of perceived direct instruction and facilitated discourse for students' perception of social presence and cognitive presence in blended learning. The results also confirm the mediating role of social presence in the effects of direct instruction

on cognitive presence, and the effects of facilitated discourse on cognitive presence. The finding suggests that students' positive perception of direct instruction and facilitated discourse in blended learning is needed to support social presence or for students to interact with each other in a meaningful way that helps them to construct and confirm meaning. Overall, the finding suggests that for effective blended learning, teachers and instructors who facilitate blended learning should use direct instruction and facilitating discourse strategies that help students to feel that they are being directed, guided, and supported in their learning.

Declarations

The authors declared no conflicts of interest.

The study was conducted in accordance with the ethical standards and approval of The Maldives National University, Maldives.

Informed consent was obtained from all individual participants included in the study.

References

Adam, M. S., Hamid, J. A., Khatibi, A., & Azam, S. M. F. (2023). Autonomous motivation in blended learning: Effects of teaching presence and basic psychological need satisfaction. *Learning and Motivation*, *83*, 101908. https://doi.org/10.1016/j.lmot.2023.101908

Akyol, Z., & Garrison, D. R. (2008). The development of a community of inquiry over time in an online course: Understanding the progression and integration of social, cognitive and teaching presence. *Journal of Asynchronous Learning Networks*, *12*, 3–22. https://files.eric.ed.gov/fulltext/EJ837483.pdf

Anderson, T., Rourke, L., Garrison, D. R., & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks,* 5(2), 1-17. https://doi.org/10.24059/olj.v5i2.1875

Annand, D. (2011). Social presence within the community of inquiry framework. *The International Review of Research in Open and Distributed Learning*, *12*(5), 40–56. https://doi.org/10.19173/irrodl.v12i5.924

Arbaugh, J. B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., Richardson, J. C., & Swan, K. P. (2008). Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *The Internet and Higher Education*, *11*(3), 133–136. https://doi.org/10.1016/j.iheduc.2008.06.003

Aslan, S. A., & Turgut, Y. E. (2021). Effectiveness of community of inquiry based online course: Cognitive, social and teaching presence. *Journal of Pedagogical Research*, *5*(3), 187–197. https://doi.org/10.33902/JPR.2021371365

Caskurlu, S. (2018). Confirming the subdimensions of teaching, social, and cognitive presences: A construct validity study. *The Internet and Higher Education*, *39*, 1–12. https://doi.org/10.1016/j.iheduc.2018.05.002

Castellanos-Reyes, D. (2020). 20 years of the community of inquiry framework. *TechTrends*, *64*(4), 557–560. https://doi.org/10.1007/s11528-020-00491-7

Cokluk, O., & Kayri, M. (2011). The effects of methods of imputation for missing values on the validity and reliability of scales. *Educational Sciences: Theory and Practice*, *11*(1), 303–309. https://files.eric.ed.gov/fulltext/EJ919903.pdf

Collier, J. E. (2020). *Applied Structural Equation Modeling Using AMOS: Basic to Advanced Techniques*. Routledge. https://doi.org/10.4324/9781003018414

Dempsey, P., & Zhang, J. (2019). Re-examining the construct validity and causal relationships of teaching, cognitive and social presence in community of inquiry framework. *Online Learning*, *23*(1). https://doi.org/10.24059/olj.v23i1.1419

Donaldson, S. I., & Grant-Vallone, E. J. (2002). Understanding self-report bias in organizational behavior research. *Journal of Business and Psychology*, *17*, 245–260. https://doi.org/10.1023/A:1019637632584

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.2307/3151312

Garrison, D. R. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, *11*(1), 61–72. https://files.eric.ed.gov/fulltext/EJ842688.pdf

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), 87–105. https://doi.org/10.1016/S1096-7516(00)00016-6

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, *15*(1), 7–23. https://doi.org/10.1080/08923640109527071

Garrison, D. R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education*, *13*(1–2), 5–9. https://doi.org/10.1016/j.iheduc.2009.10.003

Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *The Internet and Higher Education*, *10*(3), 157–172. https://doi.org/10.1016/j.iheduc.2007.04.001

Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: interaction is not enough. *The American Journal of Distance Education*, *19*(3), 133–148. https://doi.org/10.1207/s15389286ajde1903_2

Garrison, D. R., Cleveland-Innes, M., & Fung, T. S. (2010). Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework. *The Internet and Higher Education*, *13*(1), 31–36. https://doi.org/10.1016/j.iheduc.2009.10.002

Geng, S., Law, K. M., & Niu, B. (2019). Investigating self-directed learning and technology readiness in blending learning environment. *International Journal of Educational Technology in Higher Education*, *16*(1), 1–22. https://doi.org/10.1186/s41239-019-0147-0

Guo, P., Saab, N., Wu, L., & Admiraal, W. (2021). The Community of Inquiry perspective on students' social presence, cognitive presence, and academic performance in online project-based learning. *Journal of Computer Assisted Learning*, *37*(5), 1479–1493. https://doi.org/10.1111/jcal.12586

Gutiérrez-Santiuste, E., Rodríguez-Sabiote, C., & Gallego-Arrufat, M.-J. (2015). Cognitive presence through social and teaching presence in communities of inquiry: A correlational–predictive study. *Australasian Journal of Educational Technology*, *31*(3). https://doi.org/10.14742/ajet.1666

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (Vol. 5). Prentice Hall.

Hosler, K. A., & Arend, B. D. (2012). The importance of course design, feedback, and facilitation: Student perceptions of the relationship between teaching presence and cognitive presence. *Educational Media International*, *49*(3), 217–229. https://doi.org/10.1080/09523987.2012.738014

Howard, G. S. (1994). Why do people say nasty things about self-reports? *Journal of Organizational Behavior*, 399–404. https://www.jstor.org/stable/2488212

Illeris, K. (2018). A comprehensive understanding of human learning. In *Contemporary theories of learning* (pp. 1–14). Routledge.

Kozan, K. (2016). A comparative structural equation modeling investigation of the relationships among teaching, cognitive and social presence. *Online Learning*, *20*(3), 210–227. https://files.eric.ed.gov/fulltext/EJ1113302.pdf

Kozan, K., & Richardson, J. C. (2014). New exploratory and confirmatory factor analysis insights into the Community of Inquiry survey. *The Internet and Higher Education*, *23*, 39–47. https://doi.org/10.1016/j.iheduc.2014.06.002

Kreijns, K., Van Acker, F., Vermeulen, M., & Van Buuren, H. (2014). Community of inquiry: Social presence revisited. *E-Learning and Digital Media*, *11*(1), 5–18. https://doi.org/10.2304/elea.2014.11.1.5

Kucuk, S., & Richardson, J. C. (2019). A structural equation model of predictors of online learners' engagement and satisfaction. *Online Learning*, *23*(2), 196–216. https://files.eric.ed.gov/fulltext/EJ1218390.pdf

Kupczynski, L., Ice, P., Wiesenmayer, R., & McCluskey, F. (2010). Student perceptions of the relationship between indicators of teaching presence and success in online courses. *Journal of Interactive Online Learning*, *9*(1). https://www.ncolr.org/jiol/issues/pdf/9.1.2.pdf

Law, K. M., Geng, S., & Li, T. (2019). Student enrollment, motivation and learning performance in a blended learning environment: The mediating effects of social, teaching, and cognitive presence. *Computers & Education*, *136*, 1–12. https://doi.org/10.1016/j.compedu.2019.02.021

Li, L. (2022). Teaching presence predicts cognitive presence in blended learning during COVID-19: The chain mediating role of social presence and sense of community. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.950687

Ministry of Higher Education. (2020). Higher Education Statistics 2019. https://www.mohe.gov.mv/images/resources/resources/Higher%20Education%20Statistics%202019.pdf

Martin, F., Wu, T., Wan, L., & Xie, K. (2022). A meta-analysis on the community of inquiry presences and learning outcomes in online and blended learning environments. *Online Learning*, *26*(1), 325-359. https://doi.org/ 10.24059/olj.v26i1.2604

Miller, B. J.-S. (2022). *Encouraging student persistence through increased social and instructor presence: A video feedback approach* [PhD Thesis]. Arizona State University.

Moore, R. L., & Miller, C. N. (2022). Fostering cognitive presence in online courses: a systematic review (2008-2020). *Online Learning*, *26*(1), 130–149. https://files.eric.ed.gov/fulltext/EJ1340528.pdf

Morueta, R. T., López, P. M., Gómez, Á. H., & Harris, V. W. (2016). Exploring social and cognitive presences in communities of inquiry to perform higher cognitive tasks. *The Internet and Higher Education*, *31*, 122–131. https://doi.org/10.1016/j.iheduc.2016.07.004

Mutezo, A. T., & Maré, S. (2023). Teaching and cognitive presences: The mediating effect of social presence in a developing world context. *Cogent Education*, *10*(1), 2171176. https://doi.org/10.1080/2331186X.2023.2171176

Padmawidjaja, L., Radianto, W. E., Salim, I. R., Putri, D. P. K. K., & Pebruanto, D. S. W. (2022). Mediating role of social presence towards teaching presence and cognitive presence of management study program. *JMBI UNSRAT (Jurnal Ilmiah Manajemen Bisnis Dan Inovasi Universitas Sam Ratulangi)*, *9*(1). https://doi.org/10.35794/jmbi.v9i1.38640

Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education*, *144*, 103701. https://doi.org/htthttps://doi.org/10.1016/j.compedu.2019.103701

Sadaf, A., Wu, T., & Martin, F. (2021). Cognitive presence in online learning: A systematic review of empirical research from 2000 to 2019. *Computers and Education Open*, *2*, 100050. https://doi.org/10.1016/j.caeo.2021.100050

Shea, P., & Bidjerano, T. (2009). Community of inquiry as a theoretical framework to foster "epistemic engagement" and "cognitive presence" in online education. *Computers & Education*, *52*(3), 543–553. https://doi.org/10.1016/j.compedu.2008.10.007

Shea, P., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *The Internet and Higher Education*, *9*(3), 175–190. https://doi.org/10.1016/j.iheduc.2006.06.005

Stillman-Webb, N., Hilliard, L., Stewart, M. K., & Cunningham, J. M. (2023). Facilitating student discourse: Online and hybrid writing students' perceptions of teaching presence. *Computers and Composition*, *67*, 102761. https://doi.org/10.1016/j.compcom.2023.102761

Swan, K., Garrison, D. R., & Richardson, J. C. (2009). A constructivist approach to online learning: The Community of Inquiry framework. In *Information technology and constructivism in higher education: Progressive learning frameworks* (pp. 43–57). IGI Global. https://doi.org/ 10.4018/978-1-60566-654-9.ch004

Tathahira, T. (2020). Promoting students' critical thinking through online learning in higher education: Challenges and strategies. *Englisia: Journal of Language, Education, and Humanities*, *8*(1), 79–92. https://doi.org/10.22373/ej.v8i1.6636

Vaughan, N. D., Cleveland-Innes, M., & Garrison, D. R. (2013). *Teaching in blended learning environments: Creating and sustaining communities of inquiry*. Athabasca University Press.

Wang, Y. (2022). Effects of teaching presence on learning engagement in online courses. *Distance Education*, *43*(1), 139–156. https://doi.org/10.1080/01587919.2022.2029350

Wang, Y., & Liu, Q. (2020). Effects of online teaching presence on students' interactions and collaborative knowledge construction. *Journal of Computer Assisted Learning*, *36*(3), 370–382. https://doi.org/10.1111/jcal.12408

Zhang, H., Lin, L., Zhan, Y., & Ren, Y. (2016). The impact of teaching presence on online engagement behaviors. *Journal of Educational Computing Research*, *54*(7), 887–900. https://doi.org/10.1177/0735633116648171

Zilka, G. C., Cohen, R., & Rahimi, I. (2018). Teacher presence and social presence in virtual and blended courses. *Journal of Information Technology Education. Research*, *17*, 103. https://doi.org/10.28945/4061