An Investigation of the Influence of Social Presence in Online Group Activity

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.908000634

Received: 22 August 2025; Accepted: 28 August 2025; Published: 25 September 2025

ABSTRACT

The impact of social, instructional, and cognitive presences on online group work engagement was examined in this study, along with the connections between these presences. A qualitative survey of three sections (8 items for Teaching Presence, 7 for Cognitive Presence, and 8 for Social Presence) using a 5-point Likert scale was used to gather data from 286 diploma and bachelor students. Results show that students have a generally good view of the teacher's role and that online group discussions encourage cooperation and open communication. Students eventually showed great cognitive engagement as the collaboration developed, despite initial challenges in initiating discussions and handling divergent opinions during online group work. Additionally, the study demonstrated the interdependence of instructional and cognitive presence by revealing moderately positive connections between social presence and both. These findings highlight the need for instructional strategies that encourage early group projects and use technology to foster thoughtful discussion in order to strengthen online collaborative learning.

Keywords: Online Group Work; Social Presence; Teaching Presence; Cognitive Presence; Online Interaction.

INTRODUCTION

Background of Study

The shift to online education has fundamentally transformed the ways in which students interact, collaborate, and construct knowledge. Within this evolving digital learning ecosystem, social presence has emerged as a pivotal concept that significantly shapes learners' experiences and academic outcomes. Social presence refers to the extent to which students perceive others as authentic, emotionally connected participants during online interactions (Kreijns et al., 2021; Yan & Sun, 2025). This sense of connection enhances learners' feelings of belonging within a learning community, which fosters trust, empathy, and active engagement. Gao et al. (2024) found that when learners perceive a strong sense of social presence, they are more likely to contribute actively and engage meaningfully with their peers. Consequently, presence is not only a feature of the

technological platform used but also a humanizing element that elevates the quality of virtual learning.

In addition to social presence, the Community of Inquiry (CoI) framework introduces two additional essential dimensions: teaching presence and cognitive presence. Teaching presence involves the design, facilitation, and guidance of educational experiences by the instructor to support student learning (Singh et al., 2022; Watson et al., 2023). This includes organizing instructional content, setting learning goals, moderating discourse, and offering timely feedback. In contrast, cognitive presence refers to learners' ability to construct and validate meaning through reflective thinking and sustained dialogue (Wang et al., 2025; Tan & Jung, 2024). These presences function not as isolated constructs, but rather as interdependent dimensions that influence and reinforce one another in cultivating deep learning and collaborative engagement (Donelan & Kear, 2023).

The integration of these three presences is especially important in group activities, where collaboration is central to knowledge co-construction. Research has shown that the effectiveness of online group work increases when social, teaching, and cognitive presence are cultivated in a complementary manner (Villanueva et al., 2023; Alhazbi & Hasan, 2021). For example, a strong teaching presence can provide scaffolding that facilitates productive peer interaction, while a high level of social presence encourages open communication and trust, which in turn supports cognitive engagement. However, most studies tend to examine each presence individually, and limited empirical work has explored how social presence functions in relation to both teaching and cognitive presence during collaborative tasks in online environments. This limitation signals the need for a more integrative exploration of their interrelationships and their collective influence on student collaboration and learning outcomes.

Considering these factors, this study is designed to investigate the influence of social presence on interaction within online group activities, with particular emphasis on its connection with teaching and cognitive presence. The primary objective of this study is to explore the dynamics of online group interactions through the lens of the Community of Inquiry framework. Specifically, the research seeks to answer the following questions: (1) How does social presence influence interaction in online group work? (2) How does teaching presence influence interaction in online group work? (3) How does cognitive presence influence interaction in online group work? and (4) Is there a relationship between social presence and all types of presence in online group work? Through this inquiry, the study aims to provide deeper insights into the role of presence in digital collaboration, thereby informing the design of more inclusive, engaging, and effective online learning environments.

Statement of Problem

Although educational technologies and digital platforms continue to evolve, the challenge of achieving meaningful interaction in online group settings remains a pressing concern. Students frequently report a sense of disconnection due to the lack of spontaneous dialogue, limited access to non-verbal cues, and delays in receiving feedback (Ferri et al., 2020; Mustafa et al., 2022). These factors inhibit the development of interpersonal rapport, ultimately reducing motivation and group cohesion. Moreover, instructors often find it difficult to accurately assess students' emotional states or engagement levels, given the spatial and temporal separation in online classrooms (Yao et al., 2025). This limitation diminishes the ability of teaching presence to foster dynamic, real-time interaction and collaborative learning.

In addition to these challenges, the existing body of literature tends to emphasize each type of presence, namely social presence, teaching presence, and cognitive presence, as separate constructs, without adequately addressing how they interrelate within the context of group collaboration. Few empirical studies have explored the extent to which social presence may enhance or inhibit the development of teaching presence and cognitive presence during online group activities (Gaad, 2022; Schreder et al., 2023). This lack of integration contributes to a fragmented understanding of presence as a comprehensive concept and results in an absence of clear, evidence-based guidance for educators who are tasked with designing or facilitating collaborative learning experiences in virtual environments. Consequently, instructional strategies may fail to fully leverage the combined potential of these presences to improve group dynamics and support meaningful learning outcomes.

Additionally, existing online group practices often encounter difficulties such as unequal participation, reduced student engagement, and screen fatigue. Although tools like breakout rooms, forums, and collaborative documents are commonly used, they do not automatically ensure meaningful or equitable engagement (Standl et al., 2021; Bach & Thiel, 2024). Research has shown that students are likely to disengage from group sessions when they perceive a lack of emotional or cognitive connection, often choosing to remain silent or turn off their cameras (Rajan et al., 2024). These issues are particularly pronounced among students who are unfamiliar with online learning or belong to marginalized communities, thereby reinforcing disparities in participation and learning success (Means & Neisler, 2023).

In response to these challenges, the present study aims to investigate the specific ways in which social presence affects interaction in online group settings. It also seeks to determine whether social presence plays a role in enhancing or moderating the impact of teaching and cognitive presence. By exploring these relationships in depth, this research will generate empirical insights that can support the development of more targeted instructional designs and collaborative strategies. These insights are expected to assist educators and course designers in creating virtual learning spaces that promote not only functional but also socially and cognitively enriching experiences, thereby enhancing the quality and effectiveness of online group learning.

Objective of the Study and Research Questions

This study is done to explore interactions in online group work. Specifically, this study is done to answer the following questions;

- How does social presence influence interaction in online group work ?
- How does teaching presence influence interaction in online group work?
- How does cognitive presence influence interaction in online group work?
- Is there a relationship between social presence and all types of presence in online group work?

LITERATURE REVIEW

Theoretical Framework of the Study

Social Learning Theory, advocated by Bandura (1977), states that learning is achieved through observation, imitation and modelling in a social environment. In online learning, the theory is highly applicable since students learn through collaborative activities where they observe others, instructors and online interactions to build knowledge. Bandura's reciprocal determinism notion whereby personal factors, behaviour and environmental factors interact is in tandem with online group work dynamics. For example, students in virtual environments model behaviours such as communication skills, problem solving methods and participation strategies from peers and instructors (Ifinedo et al., 2020). Further, the theory gives importance to self-efficacy, which is crucial in online collaboration. Students with greater self-efficacy will engage more actively in group discussions, contribute ideas with confidence, and stay persistent on difficult tasks (Zheng et al., 2021). The lack of physical presence in online learning requires deliberate design to promote observational learning, such as formal peer feedback, video based demonstration, and interactive forums that mimic social modelling (Martin & Bolliger, 2022). Therefore, Social Learning Theory offers a sound framework for understanding how online group tasks can be designed optimally to improve collaboration and learning outcomes.

Group Work Online: Benefits and Expert Perspectives

The transition to online learning has emphasized the pedagogical potential of virtual group work, with recent research stressing its multilateral benefits. Collaborative learning in virtual spaces promotes critical thinking and problem-solving abilities, as students participate in dynamic exchanges of varied viewpoints, necessitating that they analyze, negotiate, and synthesize ideas cooperatively (Johnson et al., 2023). This process not only

enriches subject-matter knowledge but also develops higher-order cognitive abilities with transferable application to real-world contexts. Furthermore, online collaboration acts as a driver for digital literacy and 21st century skills, making students proficient in virtual communication tools, asynchronous collaboration, and adaptive learning strategies competencies increasingly required in contemporary professional environments (Cela-Ranilla et al., 2021).

In addition to cognitive benefits, online group work facilitates flexibility and inclusivity, supporting diverse schedules, learning rates, and geographical locations, and thus democratizing participation (Bower et al., 2023). Such flexibility is especially valuable for non-traditional students, including working professionals or students in remote areas. In addition, well designed virtual collaborations can foster social and emotional learning, countering the isolation that can accompany online learning. Research shows that thoughtful design, for example, icebreakers, peer feedback loops, and collaborative digital workspaces enhances interpersonal trust, empathy, and sense of community (Lowenthal & Dunlap, 2022). At the institutional level, online group work provides scalability and efficiency of resources, allowing instructors to facilitate large scale collaborative projects unfettered by physical classroom logistics (Wang et al., 2023). Cloud-based tools and Learning Management Systems further simplify coordination, rendering collaborative learning accessible and sustainable.

That said, the effectiveness of group work online is dependent on intentional instructional approaches to counteract inherent pitfalls, including unequal participation, technology differences, and the necessity of clear evaluation models (Hodges et al., 2023). When carefully considered, virtual collaboration not only duplicates but frequently augments the advantages of face to face group work in meeting the changing needs of globalized, digital first learning.

Past Studies

About ten studies that have been examining online group work consistently show that social presence, whether viewed broadly or through specific aspects like group cohesion, emotional expression, peer versus instructor presence, and factors such as interactivity and anonymity, is strongly linked to more cohesive and satisfying group experiences (Mete & Eunbee, 2016). Findings from both controlled experiments (using synchronous video/audio or text chat, with sample sizes between 60 and 135 and observational studies in asynchronous courses (with up to 2,159 participants) reveal that higher social presence is associated with improved group cohesion, effectiveness, and overall satisfaction (Mete & Eunbee, 2016). Besides, technological features that enhance interactivity, visibility, and media richness tend to boost social presence, although instructional design and group structure also have a significant impact (Youngjin & Alavi,2001). In some cases, the presence of instructors and group cohesion had a greater effect on perceived social presence than the communication medium itself (Karen & Lifang, 2019). Despite using diverse methodologies such as experimental, mixed-methods, observational, and quasi-experimental, the studies consistently find that stronger social presence enhances collaborative performance and task engagement in online group work (Mete & Eunbee, 2016).

The study by Nurul Nadia Mohammad and colleagues (2024) explored how social presence, to the extent to which participants feel others are real and emotionally engaged in online interactions, impacts communication, collaboration, and group performance in virtual learning environments. Using a quantitative survey involving 122 undergraduate students, the research examined the interrelationships between social presence, cognitive presence, and teaching presence. The findings revealed moderately significant correlations among these elements, highlighting social presence as a crucial factor in building trust, emotional connection, and a sense of community in online groups. These dynamics were shown to enhance group cohesion, effectiveness, and academic performance. Moreover, the paper discusses the importance of designing online learning environments that actively promote social presence. It underscores how reducing psychological distance and fostering positive impressions among remote learners can lead to greater motivation, satisfaction, and more successful collaboration in virtual settings.

Jungjoo Kim and colleagues (2011) conducted a study exploring the factors that influence distance learning, particularly in higher education contexts where collaborative and communicative discourse is essential for knowledge development. Among these factors, social presence emerged as a key element that needs to be

fostered, maintained, and strengthened to support discourse-based learning in online environments. The study investigated the relationships between social presence, learning satisfaction, and various demographic and contextual variables. Findings indicated that demographic factors such as gender, prior online learning experience, and employment status did not significantly affect either social presence or learning satisfaction. In contrast, effective media integration and high-quality teaching by instructors were strong predictors of both social presence and learning satisfaction. Additionally, while participant interactivity sign presence contributed to social presence, it did not have a direct impact on learning satisfaction. The study concludes with practical implications for educators and instructional designers aiming to enhance online learning experiences in higher education settings.

Conceptual Framework of the Study

The Social Learning Theory by Bandura (1977) states that there are three factors that influence learning and they are personal factors, behaviour and environmental factors. Learning becomes challenging when it is done online and even more so, through activities such as group work Group work allows learners to combine their ideas to complete a given task. Team members not only learn negotiation skills, they also improve on their communication skills Rahmat, 2020).

The conceptual framework of this study is presented in figure 1 below. This study investigates the interaction during group work online. According to Aderibigbe (2021), during group work online, learners need social presence, teaching presence and cognitive presence. Social presence is felt through interactions with the teacher and their peers. Next, teaching presence is needed more so in the online class because good planning by the teacher helps the class progress well. Lastly, cognitive presence refers to the opportunity for learners to interact with the learning materials through task and activities. This study also explores the relationship between all types of presence in group online.

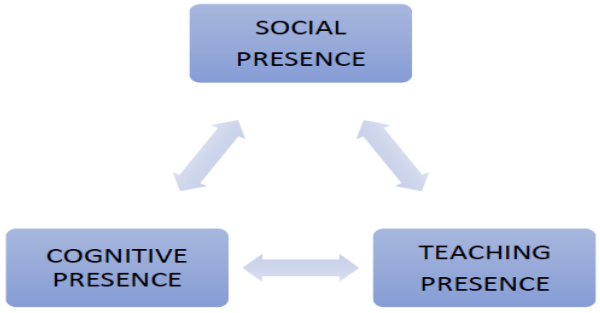

Fig 1. Conceptual Framework of the Study The Influence of Social Presence in Online Group Activity

METHODOLOGY

This quantitative study is done to explore online groupwork. A convenient sample of 286 participants responded to the survey. The instrument used is a 5 Likert-scale survey. Table 1 below shows the categories used for the Likert scale; 1 is for Never, 2 is for Rarely 3 is for Sometimes, 4 is for Very Often and 5 is for Always.

Table 1Likert Scale Use

1	Never
2	Rarely
3	Sometimes
4	Very Often
5	Always

Table 2 Distribution of Items in the Survey

SECTION	ELEMENTS (Aderibigbe, 2021)	NO. OF ITEMS
B	TEACHING PRESENCE	8
C	COGNITIVE PRESENCE	7
D	SOCIAL PRESENCE	8
	TOTAL ITEMS	23

The instrument used is a 5 Likert-scale survey and is replicated from Aderibigbe (2021). Table 2 shows the distribution of items in the survey. Section B has 8 items on Teaching Presence. Section C has 7 items on Cognitive Presence and section D has 8 items on Social Presence.

Table 3- Reliability of the Survey

CRONBACH'S ALPHA	NO. OF ITMES
.850	23

Table 3 shows the reliability of the survey. The analysis shows a Cronbach alpha of .850, thus, revealing a good reliability of the instrument chosen (Jackson, 2015). Further analysis using SPSS is done to present findings to answer the research questions for this study.

FINDINGS

Demographic Analysis

Table 4- Percentage for Demographic Profile

Question	Demographic Profile	Categories	Percen-tage (%)
1	Gender	Male	33%
		Female	67%
2	Semester	1-3	79%
		4-6	20%
		7 and above	1%
3	Faculty	Science , Engineering & Technology	38%
		Business and Management	59%
		Social Sciences	3%
4	Level of Study	Diploma	26%
		Degree	74%
5	Online Learning Experience	Less than one year	52%

		1 year and above	48%
6	Duration of online learning per week	2-4 hours per week	64%
		5-8 hours per week	26%
		More than 8 hours per week	10%
7	Class type	Mostly lectures	44%
		more activities than lectures	23%
		More lectures than activities	25%
		Mostly lectures	8%

The demographic profile comprises seven factors, as indicated in Table 4: gender, semester, faculty, level of study, online learning experience, weekly duration of online learning, and class type. According to the data, 67% of responders are female students and 33% are male students. Regarding to semester, 79% of responses are first-semester to third-semester students, 20% are fourth semester to sixth-semester students, and 1% are seventh-semester students. 38% of survey participants were students in the fields of science, engineering, and technology, 59% were students in business and management, and 3% were students in the social sciences. 74% of the study participants had a degree, and 26% had a diploma. According to the data poll, 52% of respondents have less than a year's experience with online learning, while 48% have one year or more. According to the survey, 64% of participants log between two and four hours per week, 26% log between five and eight hours, and only 10% log more than eight hours. About 44% of online learning classes are lectures, 23% are more activities than lectures, 25% are more lectures than activities, and just 8% are mostly activities.

Descriptive Statistics

Findings for Social Presence

This section presents data to answer research question 1-

How does social presence influence interaction in online group work ?

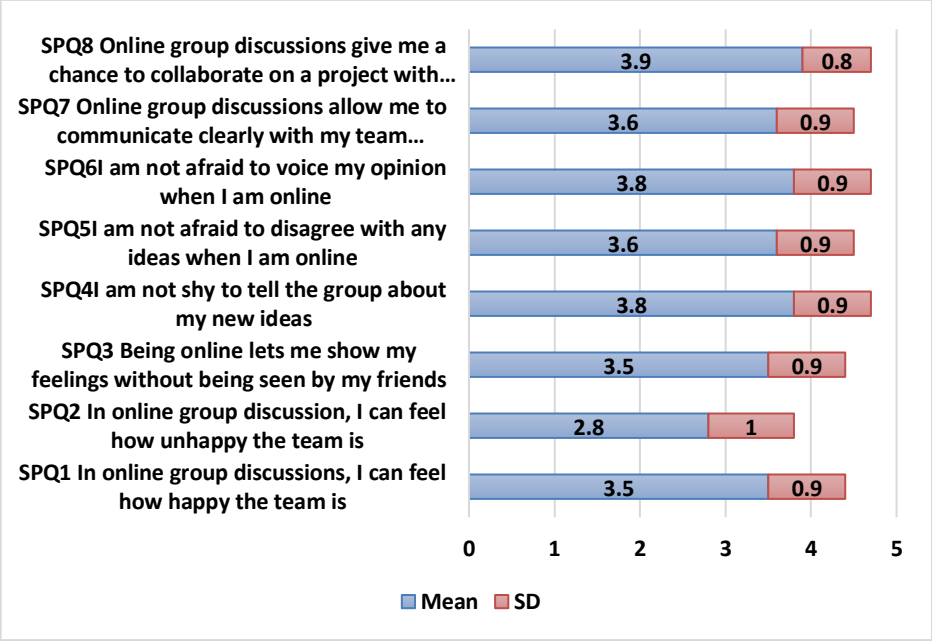

Figure 2- Mean for Social Presence

Figure 2 shows the mean for social presence. The highest mean is item 9 (mean=3.9,SD=0.8) which states that online group discussions gave the learners a chance to collaborate with their team members. Next, two items share the same mean of 3.8. The first is item 4 (mean=3.8,SD=0.9) which reveals that the learners were not shy to tell their peers about their new ideas. Next, item 6 (mean=3.8, SD=0.9) shows that the students were not afraid to voice their opinion when they were online. The lowest mean is item 2 (mean=2.8, SD=1) that states that in online group discussions, they could feel how unhappy the team was.

Findings for Teaching Presence

This section presents data to answer research question 2- How does teaching presence influence interaction in online group work?

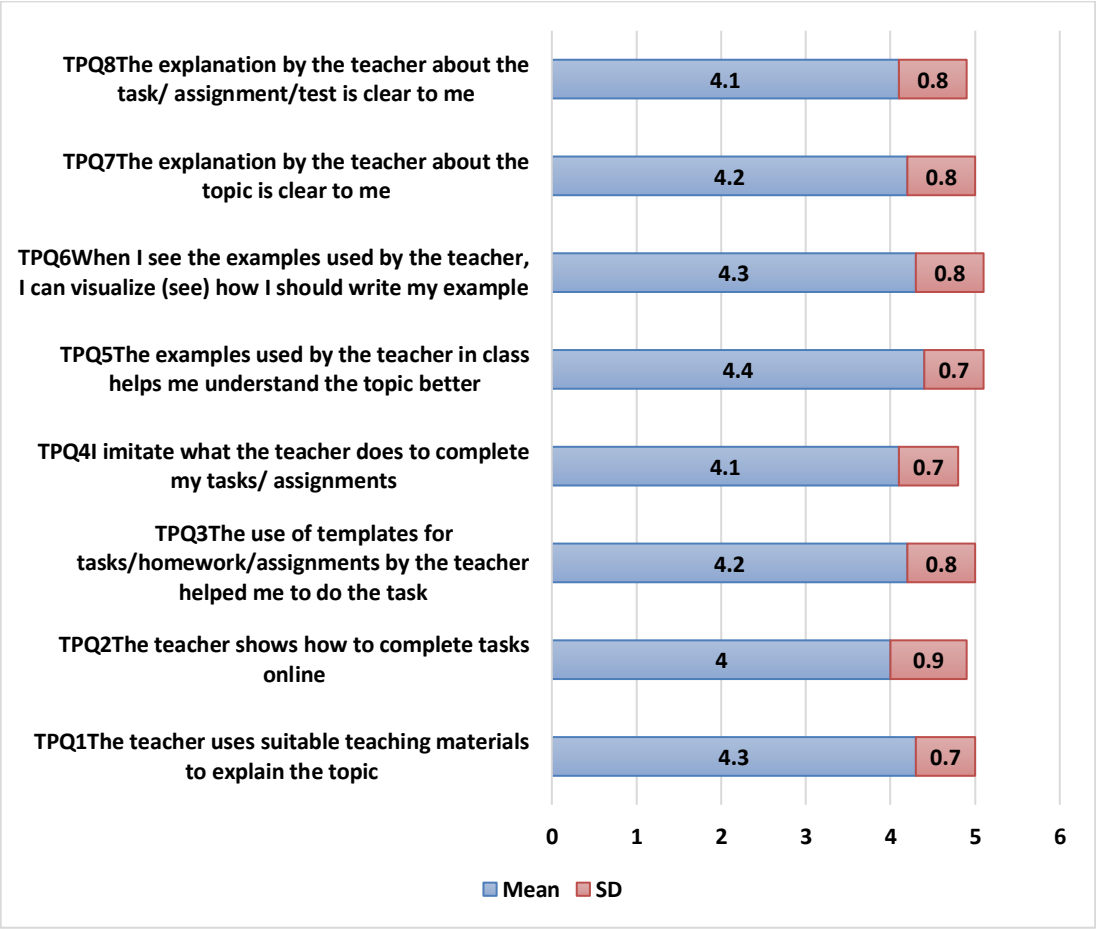

Figure 3- Mean for Teaching Presence

Based on the data presented in Figure 3, students generally perceive teaching presence positively in the context of online group work. The highest mean score was recorded for TPQ5 (Mean = 4.4, SD = 0.7), indicating that the examples provided by the teacher helped students understand the topic better. This was followed by TPQ1 and TPQ6 (Mean = 4.3), suggesting that appropriate teaching materials and the use of examples supported students in visualizing how to approach their tasks. The lowest mean score was for TPQ2 (Mean = 4.0, SD = 0.9), which, although still positive, reflects slightly more varied perceptions regarding the teacher's demonstration of how to complete tasks online. Overall, the mean scores, ranging from 4.0 to 4.4, indicate a consistent and favourable view of the teacher's role in guiding, explaining, and supporting students' learning processes in online group settings.

Findings for Cognitive Presence

This section presents data to answer research question 3- How does cognitive presence influence interaction in online group work?

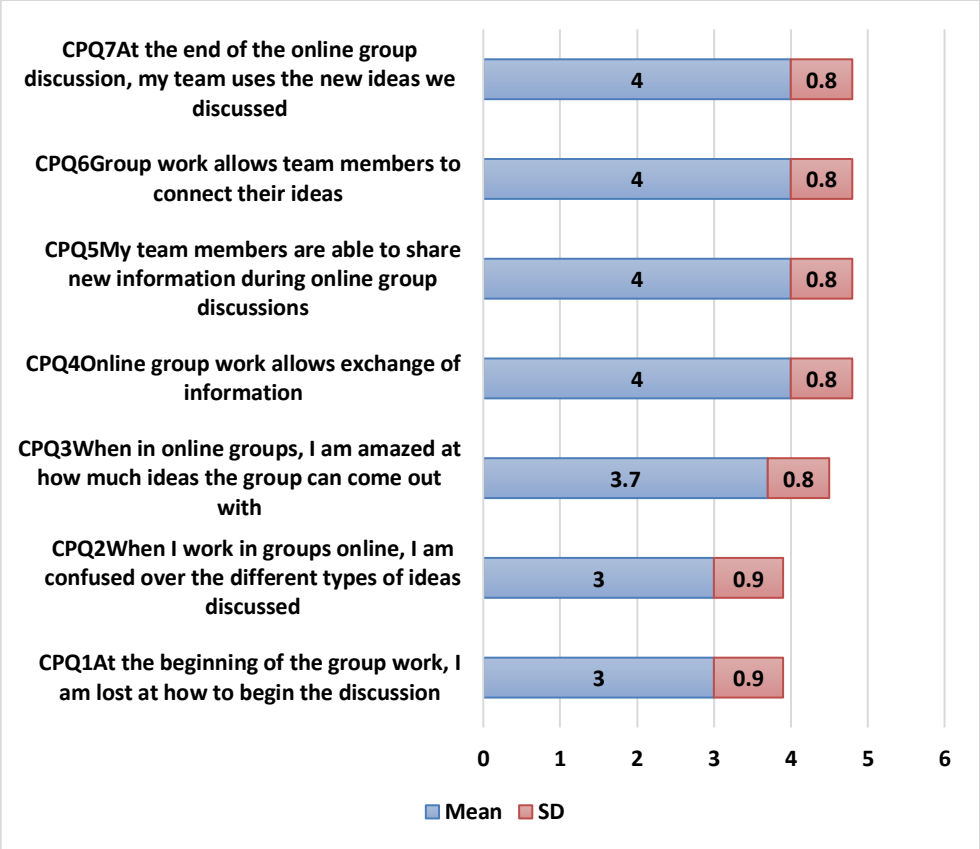

Figure 4- Mean for Cognitive Presence

The findings of the study on cognitive presence uncover imperative insights into the ways in which meaning is constructed and intellectual engagement occurs among students in online group work activities. Whereas early phases of collaboration indicated moderate difficulty reflected by lower mean scores on items such as "I am lost at how to begin the discussion" (M=3.0, SD=0.9) and "confusion over divergent ideas" (M=3.0, SD=0.9) the later stages reflected strong cognitive engagement. Strong agreement was noted among participants on items such as "online group work allows exchange of information" (M=4.0, SD=0.8), "team members share new information effectively" (M=4.0, SD=0.8), and "connecting ideas to synthesize new knowledge" (M=4.0, SD=0.8), suggesting that structured conversation within the groups supports upper-level thinking. Importantly, the top-rated item, "amazement at the group's ideation capacity" (M=3.7, SD=0.8), dovetails with the Community of Inquiry framework, which informs that cognitive presence reaches a peak when learners move from exploration to resolution through ongoing discourse (Fiock et al., 2023). These findings support previous research highlighting the contribution of scaffolded collaboration in virtual environments, where early disorientation (a natural process in cognitive presence) gives way to meaningful co-construction of knowledge when assisted by explicit guidelines and peer engagement (Wang et al., 2025). The findings highlight the necessity of pedagogical interventions that buffer early-stage uncertainty, such as pre-defined discussion protocols or instructor modelling while harnessing technology to facilitate amplification of reflective conversation and application of ideas, and in so doing, deepen online collaborative learning.

Exploratory Statistics (correlation)

Findings for Relationship between social presence and all types of presence in online group work This section presents data to answer research question 4- Is there a relationship between social presence and all types of presence in online group work?

To determine if there is a significant association in the mean scores between social presence and all types of presence in online group work, data is analysed using SPSS for correlations. Results are presented separately in table 4, 5 and 6 below.

Table 4- Correlation between Social and Teaching Presence

		SOCIAL PRESENCE	TEACHING PRESENCE
SOCIAL PRESENCE	Pearson (Correlation	1	.438**
	Sig (2-tailed)		.000
	N	286	286
TEACHING PRESENCE	Pearson (Correlation	.438**	1
	Sig (2-tailed)	.000	
	N	286	286

**Correlation is significant at the 0.01 level (2-tailed)

Table 4 shows there is an association between social and teaching presence. Correlation analysis shows that there is a moderate significant association between social and teaching presence (r=.438**) and (p=.000). According to Jackson (2015), 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 moderate positive relationship between social and teaching presence.

Table 5- Correlation between Social and Cognitive Presence

		SOCIAL PRESENCE	COGNITIVE PRESENCE
SOCIAL PRESENCE	Pearson (Correlation)	1	.394**
	Sig (2-tailed)		.000
	N	286	286
COGNITIVE RESENCE	Pearson (Correlation)	.394**	1
	Sig (2-tailed)	.000	
		286	286

**Correlation is significant at the 0.01 level (2-tailed)

Table 5 shows there is an association between social and cognitive presence. Correlation analysis shows that there is a moderate significant association between social and cognitive presence (r=.394**) and (p=.000). According to Jackson (2015), 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 moderate positive relationship between social and cognitive presence.

Table 6- Correlation between Teaching and Cognitive Presence

		TEACHING PRESENCE	COGNITIVE PRESENCE
TEACHING PRESENCE	Pearson (Correlation	1	.408**
	Sig (2-tailed)		.000

	N	286	286
COGNITIVE RESENCE	Pearson (Correlation	.408**	1
	Sig (2-tailed)	.000	
	N	286	286

**Correlation is significant at the 0.01 level (2-tailed)

Table 6 shows there is an association between teaching and cognitive presence. Correlation analysis shows that there is a moderate significant association between teaching and cognitive presence (r=.408**) and (p=.000). According to Jackson (2015), 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 moderate positive relationship between teaching and cognitive presence.

CONCLUSION

Summary of Findings and Discussions

The findings in Figure 2 suggest that online group discussions are a good way for students to collaborate and communicate openly. The item with the highest rating suggests that these conversations effectively promote teamwork. Additionally, two other highly rated categories imply that students feel free to express their thoughts and share novel ideas, pointing to a welcoming and non-threatening atmosphere. The item with the lowest rating, on the other hand, indicates that participants find it challenging to gauge their teammates' emotional states—more especially, their level of unhappiness—during online conversations. This implies that although online conversations are useful for exchanging opinions and collaborating cognitively, they might not include the nonverbal clues that are essential for figuring out a group's emotional dynamics. The results of Figure 2 support Gao et al.'s (2024) statement that students are more likely to actively participate and interact with their peers when they feel a strong sense of social presence. As a result, presence enhances the quality of virtual learning by being a feature of the technological platform and the human component.

Students' perceptions of the teacher's role in online group projects are overwhelmingly positive, according to the data in Figure 3. In particular, the examples included were useful for comprehending concepts and illustrating how to accomplish tasks. The teacher's online task demonstrations were deemed somewhat less effective than other portions of the lesson, even though every aspect of the teaching presence was highly praised. Students think their teachers are doing a great job of directing and assisting their learning in online group situations, as seen by the generally high scores.

Figure 4 shows that students first find it difficult to get started and handle conflicting viewpoints when working in online groups. Nevertheless, they become more involved and productive as the partnership goes on. They overwhelmingly concur that working in groups online facilitates information sharing, interchange of ideas, and the synthesis of new knowledge. The group's "amazement at the group's ideation capacity," which indicates that the talks assist them in moving from concept exploration to solution formulation a sign of deep thinking was the most encouraging finding. According to this, the initial misunderstanding in online group work can be resolved with the right help and direction, such as explicit instructions or teacher examples, resulting in productive and significant knowledge creation. According to the findings in Figure 4, the students in this study did not belong to the category of students who are more likely to stop participating in group activities when they feel that they are not emotionally or cognitively connected, frequently opting to keep quiet or switch off their cameras (Rajan et al., 2024).

According to research results, there is a direct correlation between the three forms of presence—social, cognitive, and instructional. Both instructional and cognitive presence are often rated positively by students who have a strong sense of social connection. This suggests that students' capacity for critical thinking and learning is enhanced when they have positive relationships with peers and receive excellent instruction from

their teachers. These three components must essentially complement each other for a successful online learning environment and support it with statements (Villanueva et al., 2023; Alhazbi & Hasan, 2021)

Implications and Suggestions for Future Research

The study's conclusions provide significant support for the Community of Inquiry (CoI) concept, especially given how closely related its three main presences—social, cognitive, and teaching—are. The study supports the notion that these three components help one another rather than existing independently. For example, the results indicate that social presence is positively correlated with both cognitive and teaching presence. This is in line with the CoI paradigm, which holds that a strong social presence where students experience a feeling of community and belonging is a fundamental component that facilitates deeper cognitive engagement and effective instruction. The study's conclusion that "amazement at the group's ideation capacity" replaces initial bewilderment in online group work lends more credence to the CoI's model of cognitive presence, which describes a process from triggering events and investigation to integration and resolution. The findings support the CoI framework's understanding of online learning as a whole process in which success depends on intellectual engagement, instructional design, and the human factor. The results recommend several significant adjustments to online group instruction. Since students first have trouble starting and juggling contradictory ideas, teachers should use scaffolding techniques to reduce this early ambiguity. This could entail setting clear, precise guidelines, establishing established discussion procedures, and setting an example of productive teamwork and communication strategies. For instance, a teacher could show students how to combine disparate ideas or offer an organised conversation framework. Additionally, since demonstrations were thought to be marginally less successful, educators ought to concentrate on making them more participatory and interesting. This could entail a combination of live Q&A sessions, pre-recorded videos, and technology that enables more active student participation during the demonstration. Teachers can assist students in overcoming the early phases of collaboration more rapidly and achieving more significant and fruitful knowledge creation by proactively addressing these initial obstacles and modifying their teaching strategies.

Future research could be built on these findings by employing a mixed-methods approach that blends qualitative information from focus groups and interviews with quantitative data. This could offer a better knowledge of the emotional experiences of students in online groups as well as the difficulties they faced, like the inability to identify emotional cues and resolve conflicts without face-to-face communication. To monitor how students' social and cognitive presence changes over the course of a semester, longitudinal research would also helpful. This would offer a more dynamic perspective on the progression from initial confusion to significant engagement. Lastly, comparative studies of different online tools and platforms could assess how well they promote nonverbal communication and emotional expression. This research would assist inform the development of more effective teaching strategies and technology innovations, as well as provide educators with specific recommendations on which technologies best support the human element of online learning.

ACKNOWLEDGMENT

We are deeply appreciative of the guidance provided by Professor Dr. Noor Hanim Rahmat in the preparation of this paper.

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