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Exploring The Relationship between Teaching, Cognitive Presence and Social Presence in Online Learning

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Abstract

The rapid adoption of online learning is due to its several advantages over traditional classroom training. However, the remote nature of online learning can pose challenges for both students and instructors. Instructors were thrust into a big transition to online instruction with no preparation time or resources. Whether or not the quality of education has improved as a result of the shift from the more traditional face-to-face format to the more modern e-learning approach is the subject of some discussion. This study aims to address the relationship between teaching, cognitive presence and social presence in online learning. A quantitative study is done to explore online presence among learners who attend online classes. A purposive sample of 100 participants responded to the survey. The instrument used is a survey and is replicated from (Arbaugh et al., 2008). There are 4 sections altogether (refer to table 1). Section A has items on demographic profile. Section B has 13 items on teaching presence. Section C has 9 items on social presence and section D has 12 items on cognitive presence. The findings of this study suggest that online learning environments require a balance of teaching, cognitive presence, and social presence to facilitate effective learning. The exploration of the relationship between teaching, cognitive presence, and social presence in online learning has important implications for the design and delivery of online courses.

Keywords: Online Learning, Cognitive Presence, Social Presence

Introduction

Background of Study

The COVID-19 crisis has caused challenges to many work sectors to maintain their operations to remain stable. The education sector is no exception, where it was the first to accept the challenge to shift to online learning (Pokhrel & Chhetri, 2021). To cater to the rules and procedures set by the government, educators were also impelled to creatively redefine education practices to suit the online learning approach. This is hence, to prepare the entities to adapt to the new normal and post-COVID world. According to Christopher et al (2020) and Matthews et al (2021), two prominent predictors in ensuring the success of remote teaching mode are online presence and learner engagement. Learner engagement is the ability of a learner to actively participate in learning activities. On the contrary, presence in online learning means "being there on the Internet" (Oliveira et al., 2015). This applies to academic institutions where both instructors and learners are required to attend the online class, thus be present during the teaching and learning processes. Similarly, Singh et al (2022) added that, online presence supports interpersonal interaction as it allows both instructor and learner to virtually meet in class.

Meanwhile, Garrison et al (1999) defined online presence as a tool reflecting the learning process through the interaction of three interconnected dimensions: social presence, cognitive presence and teaching presence. They believe that the intersection of these three presences builds a positive and meaningful learning environment in the virtual medium of instruction. Moore & Miller (2022) shared the same view where they concur that the three dimensions are important to work side by side to achieve the success of online learning. While social presence mirrors one's "real self" when working in groups, cognitive presence displays the learner's ability to make meaning from the learning activities. Teaching presence, on the other hand, explains the appearance of the instructor and learning materials during class time.

As much as the presences of teaching, cognitive and social are vital to support effective learning, the impact on student motivation has rarely been emphasised and discussed publicly. It is good to highlight that with the presence of the three variables, students often reported that the clearer and more interesting tasks given to them through online learning make them be more motivated as they can brainstorm the tasks effectively in groups (Redmond, 2014; Liu & Yang, 2014). Besides that, timely feedback from the instructors is another trick to keep the learners motivated (Sheridan & Kelly, 2010). As learners get prompt responses from the instructor, the possibility of them losing track of what they have learned in class is very low. Learners tend to enjoy the learning process as they are guided by the feedback given by the instructors. Therefore, it is clear that teaching, cognitive and social presences are important factors in encouraging learner motivation.

In regards to the Malaysian context, learners agree that online presence does positively influence their learning satisfaction, in which social presence, for example, helps promote learners' affective and cognitive skills in online classes (Ho et al., 2022). Annamalai (2021) however, pointed out that learners feel burned out with online learning due to the burden of processing too much virtual information, besides having to learn to be digitally literate. Hence, with the inconclusive findings reported on this topic, this study is conducted to investigate the influence of presence on online learning. Overall, this paper contributes to the existing literature by offering clear explanations of how teaching presence, cognitive presence and social presence influence online learning. By analysing the highlighted variables, learners

can be mindful of the factors affecting online learning and strategise systematic ways to ensure learning effectiveness.

Statement of Problem

Online learning has become increasingly popular, particularly in the wake of the COVID-19 pandemic. As a result, there has been a significant shift towards exploring the impact of online teaching practices and their effectiveness in promoting student learning. Few studies have shown that online learning has facilitated and provides an ideal situation for many learners. One of the most significant advantages is during the closure of schools and universities due to the pandemic which has led to a significant increase in demand for online learning, as it provides a safe and accessible alternative to traditional classroom-based learning (Turnbull et al., 2021). Online learning has enabled students to continue their education without interruption, providing them with access to course materials, assignments, and instructional support remotely (Dhawan, 2020). Apart from that, online learning offers an ideal situation for students to develop cognitive presence where learners can construct meaning and make sense of course content at the comfort of their homes (Singh et al., 2022).

Online learning enables learners to access course materials, lectures, and discussions at their own pace and review materials as needed, promoting a deeper understanding of the content. Additionally, online learning often includes interactive multimedia content and tools such as virtual labs and simulations, which can provide a more engaging and active learning experience, enhancing cognitive presence (Singh et al., 2022; Turnbull et al., 2021). Moreover, online learning also facilitates social presence which refers to the sense of community and connection that learners experience in a course as it offers opportunities for learners to connect with their peers and instructors through online discussion forums, chat rooms, and group projects (Singh et al., 2022). Learners can also engage in collaborative learning, share ideas and resources, and receive feedback from their peers and instructors, promoting social presence (Turnbull et al., 2021).

However, according to Martin et al (2022) there is a need to explore the critical aspect of the relationship between teaching, cognitive presence, and social presence in online learning. Few studies have shown that there is a lack of cognitive presence where learners encounter difficulties to construct meaning and understanding without the guidance of teachers and instructors (Martin et al., 2022; Singh et al., 2022; Turnbull et al., 2021). Consequently, few studies pointed out the absence of social presence has affected the learners' connection to others in the online learning environment as learners may experience feelings of isolation and disconnectedness (Dhawan, 2020; Martin et al., 2022). While previous research has examined the effects of cognitive and social presence independently, there has been limited investigation into the relationship between the two and the role of teaching practices in fostering them in online learning environments. Therefore, this research will address this gap in the literature by exploring the relationship between teaching, cognitive presence, and social presence in online learning, and identifying effective strategies for promoting these elements to enhance student learning outcomes and experiences in online learning environments.

Objective of Study and Research Questions

This study explores how teaching presence, cognitive presence and also social presence influence online learning. In addition to that, it also investigates the relationship between teaching presence, cognitive presence and social presence. Specifically, this study is done to answer the following questions;

- How does teaching presence influence online learning?
- How does cognitive presence influence online learning?
- How does social presence influence online learning?
- What is the relationship between teaching presence and social presence?
- What is the relationship between teaching presence and cognitive presence?
- What is the relationship between cognitive presence and social presence?

Literature Review

Online Presence in Online Classrooms

Despite academics and researchers agree on the benefits of online learning, such as accessibility, flexibility, and affordability, they have expressed a number of reservations about this method of teaching or learning (Dhawan, 2020). Not all course types are suited to online learning. Additionally, for students to succeed in an online learning environment, they require a variety of skill sets. Online education has been criticised for lacking the interaction necessary to foster higher-order learning and critical thinking. Many academics from various disciplines have examined various elements of online learning due to the advantages and issues. It has been discovered that online presence, specifically educational, social, and cognitive presence, is crucial to the success of online learning. According to Gunawardena and Zittle (1997), the level to which a person is viewed as 'real' in mediated communication is referred to as online presence. In other words, the other participants' perceived reality is an indicator of their existence. Students prefer to build psychological distance between themselves and other participants when they are not there, and the experience becomes focused on tasks and are dissociated (Rutter, 1984). Students' academic performance will suffer as a result of task-oriented or depersonalised experiences. There are few disagreements about what presence is and how to quantify it. There is, however, no method to measure the presence in real time and arrange for appropriate reactions. There is no recollection as to how each presence works. As a result, designing a presence-based educational framework for online education is difficult. It is also challenging to determine the link between internet presence and student performance. Finally, it was observed that online presence had an influence on student satisfaction and learning results. (Rourke et al., 2001; Tu, 2002; Shea et al., 2010).

Past Studies on Online Presence

A study conducted by Kilis and Yildirim (2019) looked at the posting patterns of student's cognitive presence, social presence, and teaching presence. The data obtained were from 91 students who are enrolled in an online associate degree programme from the Department of Medical Documentary and Secretary. The program was designed for 16 weeks, consisting of around 100 minutes of synchronous sessions for student-teacher contact hours each week. Students took part in six online asynchronous activities and discussion on their chosen LMS platform, Moodle while using the social networking site Facebook as the communication medium. The findings from the study deduced that students' postings showcased behaviours of teaching presence, cognitive presence and social presence at a highly significant level. The

factors for such presences were identified to be topics used in classes based on real-life cases and supplemented with adequate reflective activities for students. It is identified that students were able to excel in a large online setting if the conditions earlier were supplemented with; active communication on structured discussion activities, existence of cooperative student groups, regular activities by class instructors and comprehensive instant feedback (Kilis & Yildirim, 2019). Simply, the study managed to identify the potential remedies to difficulties in running a large online classroom.

In a study done by Guo et al (2021) on a freshman online course called Introductory Course of Mental Health at a Chinese university, it is found that the expressions of effectiveness and exploration were the most recurrently used social and cognitive presences. They were observed to be present in the students' communicative activities while undergoing the online course. Comprising two classes of 45 minutes sessions per week totalling to a 90 minutes per week of contact hours, the students' transcripts of WeChat messages were coded accordingly to identify signs of social and cognitive presences. The study found that academic performance was positively related to the social presence of humour use, affective expressions, and vocatives among peers. While, cognitive presences can be observed in the form of student-centred exploration and opinion exchanges between the students. The implication of this study is to highlight the proven effectiveness of a properly curated and organized Project-based Learning (PjBL) can contribute to students' academic performance.

In Nasir (2020), it is found that satisfaction from students was vital in an online learning setting. The study managed to look at the relationship between students' satisfaction and social presence while actively participating in online discussions in the classroom's designated LMS. Comprising 3000 online students from a private higher educational institute in Malaysia, the participants were enrolled in an online programme for a semester. It is found that social presence was the main contributor in predicting the level of satisfaction for the course. The students showed high levels of interaction and social presence by interacting actively with their classmates. Thus, it was observed that higher social presence level signified higher levels of course satisfaction. This was further proven from the affective expression, group cohesion and open communication amongst the participants. Other notable factors in the study were the age groups of the participants which were 22 until 35-year-olds. These age groups were found to be highly self-directed and independent learners. Other communicative elements observed from the study was that instructor feedback was utmost important for the participants in encouraging them to conduct more student-to-student conversation. Besides, students felt more at ease joining an online course if they had prior experiences in joining online courses. The number of completed courses by a student significantly dictates student's satisfaction towards a course (Nasir, 2020). Thus, instructors ought to be aware of students' comfortability and familiarity towards a course and its component on top of providing immediate feedback and technical support whilst commencing the course. The implication of this study is that stakeholders should be assertive in making online learning meaningful for the intended audience as students' satisfaction and social presence play vital roles in effective online learning.

Conceptual Framework

This study is rooted from the variables used in the study by (Arbaugh, et.al., 2008). The study presented three important conditions for successful online learning and they are teaching presence, cognitive presence and social presence. Teaching presence. In an online class, the presence of the teacher is not missing. This is seen or felt through the teachers' use of

materials and also the method used by the teacher to convey the lesson meaningfully. Next, cognitive presence is the extent in which the learners are able make meaning from what they have learnt and this is done through cognitive engagement throughout the lesson. According to Rahmat et.al (2022) cognitive engagement allows learners to absorb meaning into the lesson from their own viewpoint. Social presence is needed in online learning so learners are not deprived from the connection with the people around them throughout the learning process.

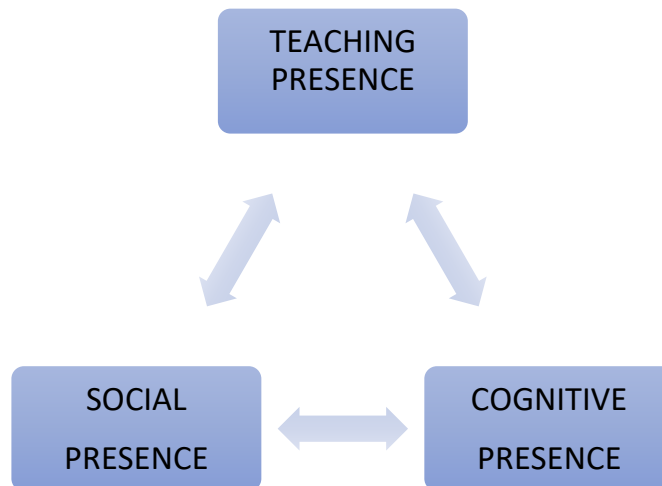


Figure 1-Conceptual Framework of the Study-Teaching presence, cognitive presence and social presence: How do they co-relate?

Methodology

This quantitative study is done to explore online presence among learners who attend online classes. A purposive sample of 100 participants responded to the survey. The instrument used is a survey and is replicated from (Arbaugh, et.al., 2008). There are 4 sections altogether (refer to table 1). Section A has items on demographic profile. Section B has 13 items on teaching presence. Section C has 9 items on social presence and section D has 12 items on cognitive presence.

Table 1

Distribution of Items in the Survey

SECTION	TYPE OF PRESENCE	SUB-CATEGORIES	ITEMS	TOTAL
B	TEACHING PRESENCE	Design & Organisation	4	13
		Facilitation	6	
		Direct Instruction	3	
C	SOCIAL PRESENCE	Affective Expression	3	9
		Open Communication	3	
		Group Cohesion	3	
D	COGNITIVE PRESENCE	Triggering Event	3	12
		Exploration	3	
		Integration	3	
		Resolution	3	
		TOTAL NO OF ITEMS		34

Table 2
Reliability of Survey

Cronbach's Alpha	N of Items
.962	34

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .962, thus, revealing a good reliability of the instrument chosen/used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

Findings

Findings for Demographic Profile

Q1.Level of Study

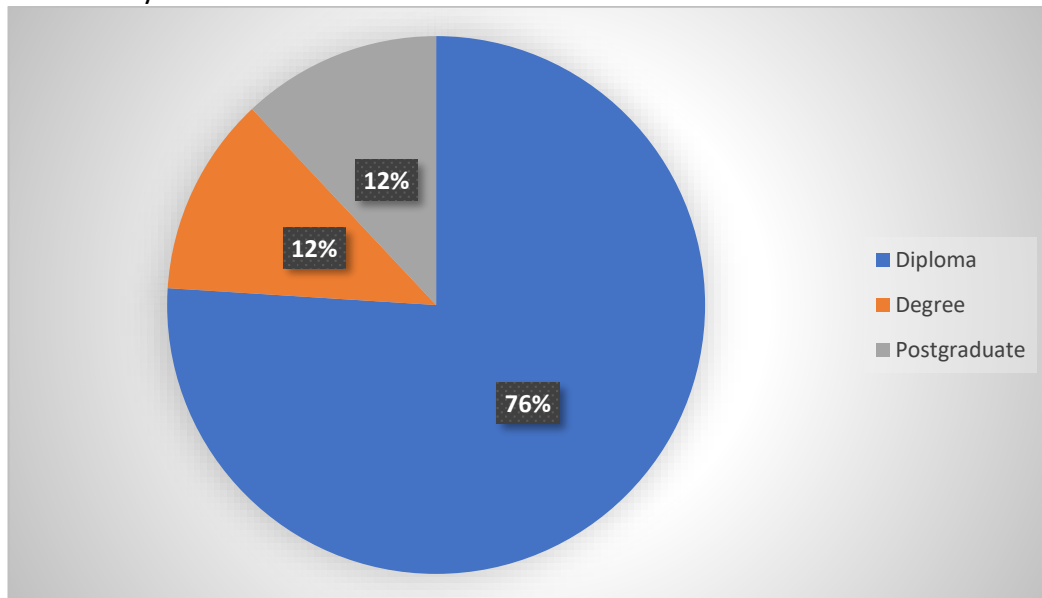


Figure 2- Percentage for Level of Study

Figure 2 shows the level of study of the respondents. 76% are doing their diploma studies. 12 % of the respondents are doing their degree while 12% are postgraduate students.

Q2. Gender

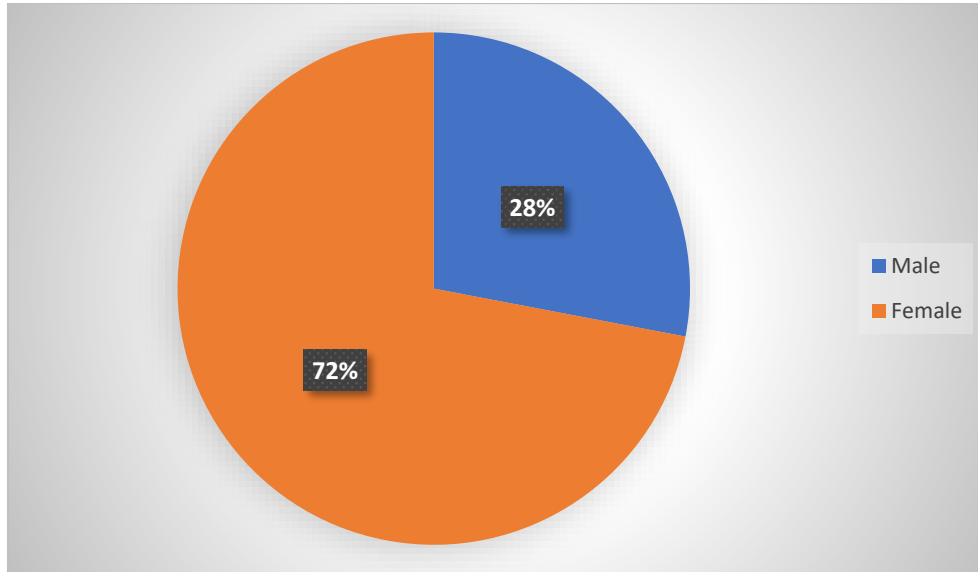


Figure 3- Percentage for Gender

With reference to figure 3, it can be seen that 28% of the respondents are male and 72% are female.

Q3 Age Group

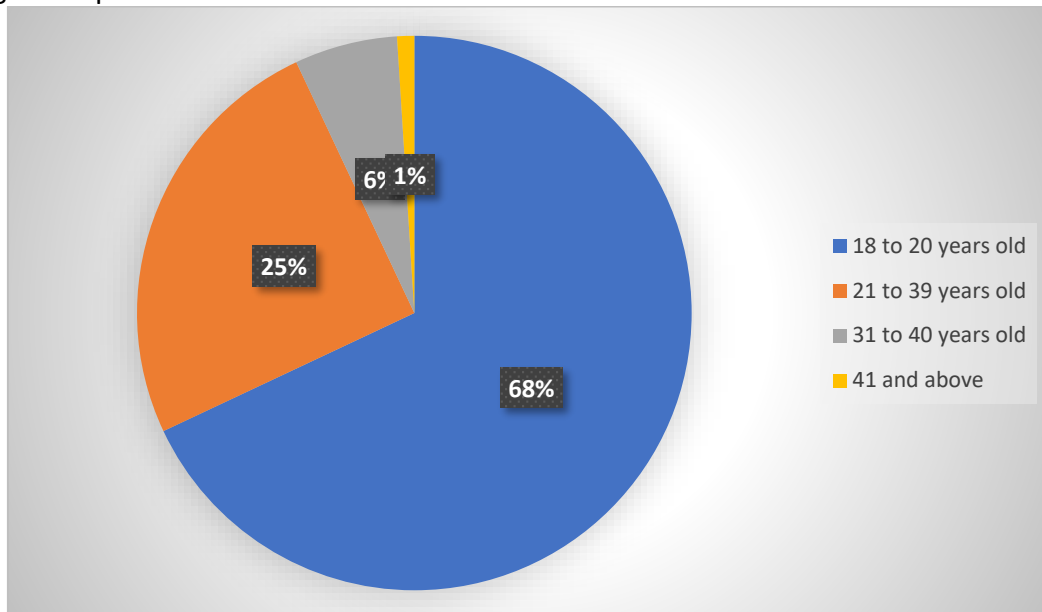


Figure 4- Percentage for Age Group

Figure 4 shows the percentage for age group. 68% of the respondents are aged from 18-20 years old. 25% are aged from 21 to 30 years old. In addition to that, 6% are aged from 31 to 40 years old and 1% are aged from 41 and above.

Q4 Faculty

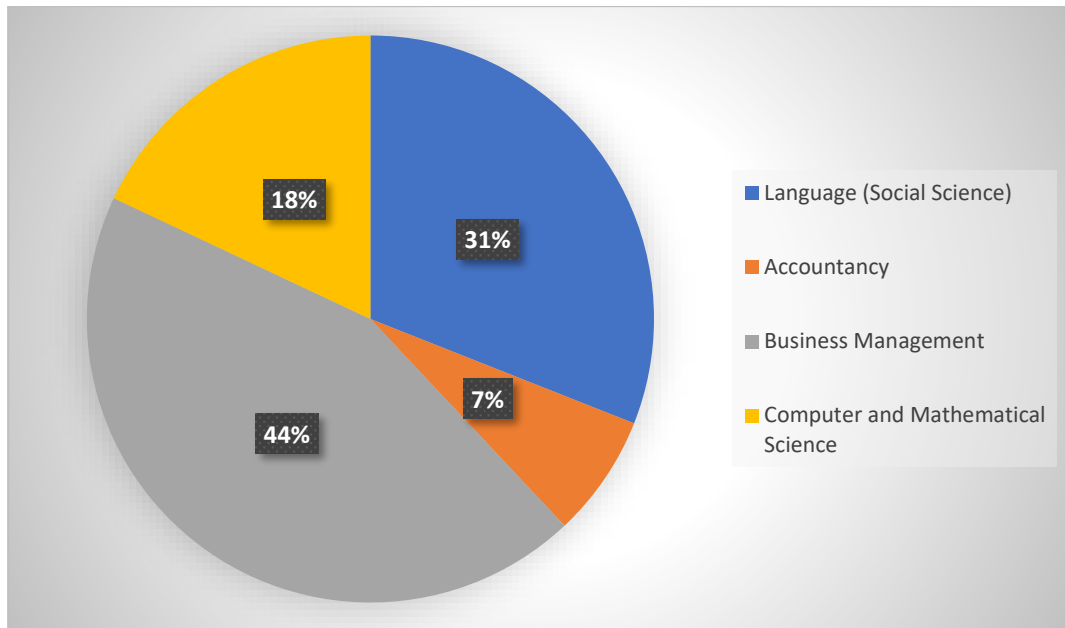


Figure 5- Percentage for Faculty

Figure 5 presents the percentage for faculty. 31% of the respondents are from the social sciences faculty. 7% are from the accountancy. Next, 44% are from the business management faculty while 18% are from the computer and mathematical science.

Q5 Semester

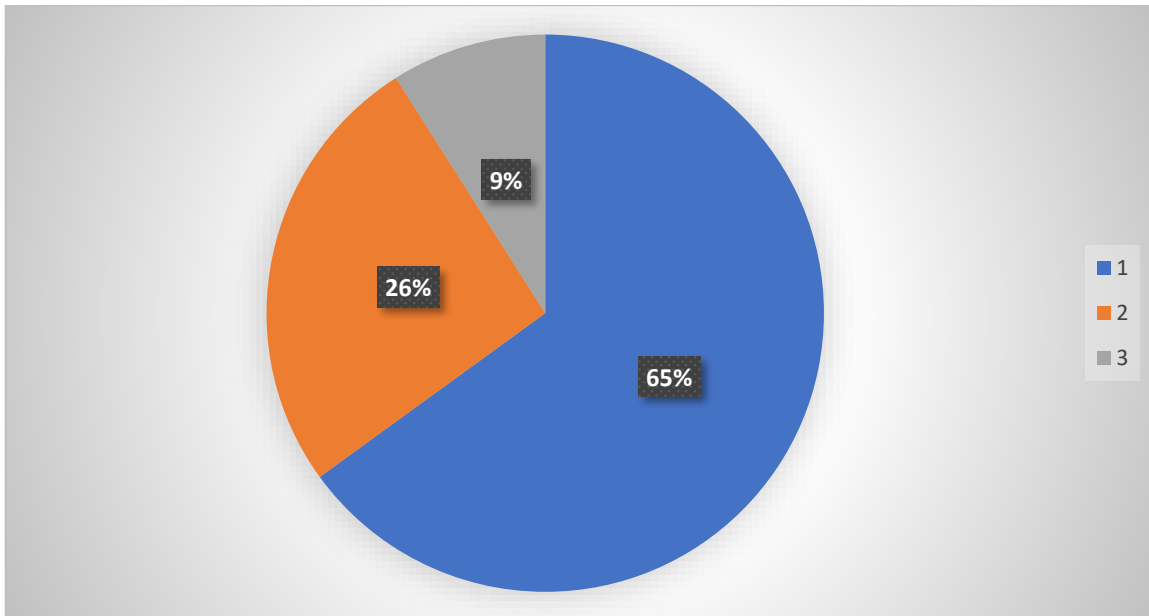


Figure 6- Percentage for Semester

Figure 6 shows the percentage for semester. 65% of the respondents are studying in semester 1. In addition to that, 26% of the respondents are in semester 2 and 9% are in semester 3.

Findings for Teaching Presence

This section presents data to answer research question 1: How does teaching presence influence online learning?

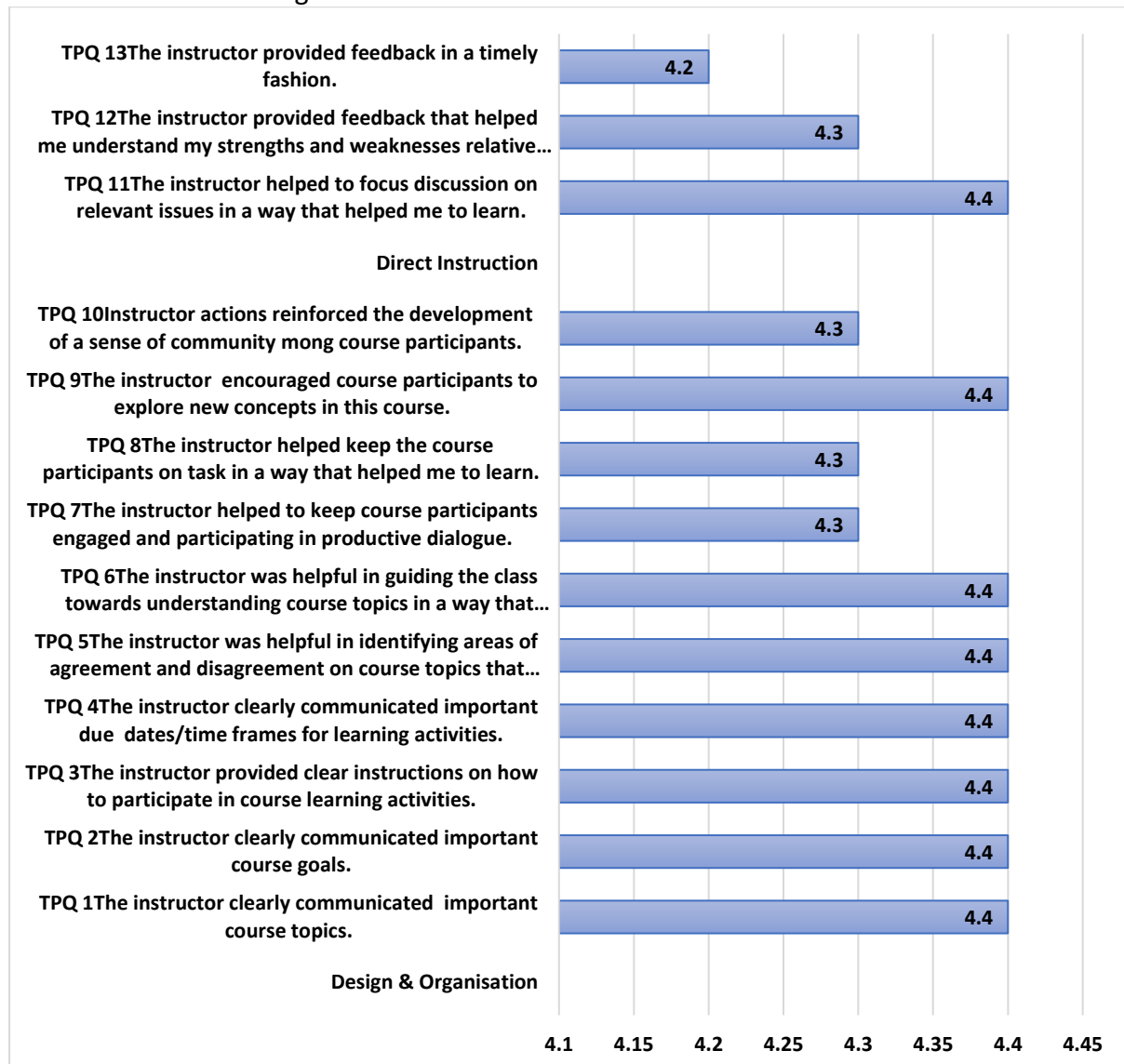


Figure 7- Mean for Teaching Presence

Figure 7 shows the mean for teaching presence. Several items shared the highest mean of 4.4. Respondents reported that instructor “communicated important course topics”, “communicated important course goals”, “provided clear instructions on how to participate in course learning activities”, “communicated important due dates/time frames for learning activities”, “was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn”, and “was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking” and also “encouraged course participants to explore new concepts in this course”.

Findings for Cognitive Presence

This section presents data to answer research question 2: How does cognitive presence influence online learning?

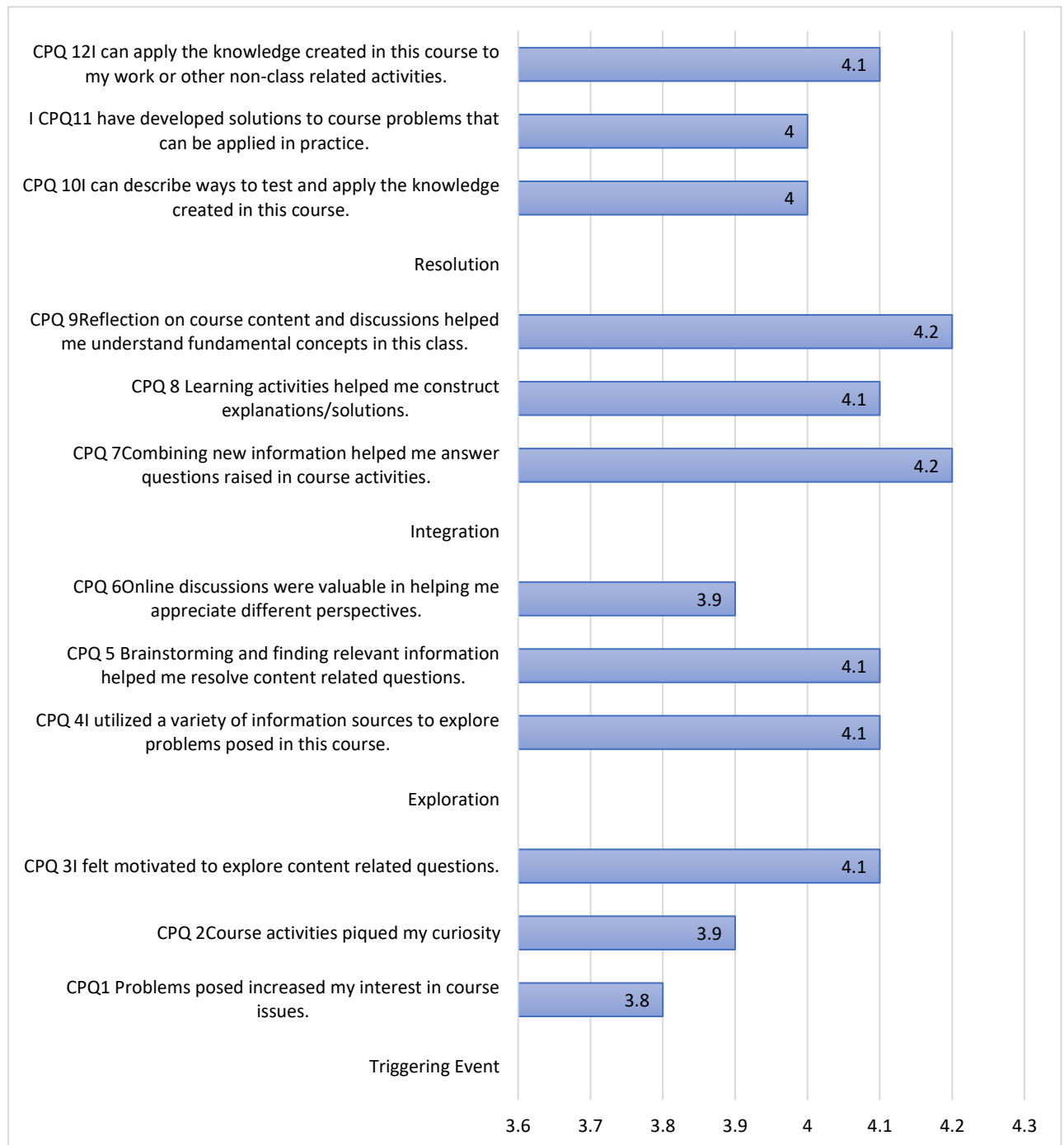


Figure 8- Mean for cognitive presence

Figure 8 presents the mean for cognitive presence. The highest mean is 4.2 for the items “Combining new information helped me answer questions raised in course activities”, and “can describe ways to test and apply the knowledge created in this course”. This is followed by the mean of 4.1 for “motivated to explore content related questions”, “utilized a variety of information sources to explore problems posed in this course”, “Brainstorming and finding relevant information helped me resolve content related questions”, “Learning activities

helped me construct explanations/solutions”, and also “can apply the knowledge created in this course to my work or other non-class related activities”.

Findings for Social Presence

This section presents data to answer research question 3: How does social presence influence online learning?

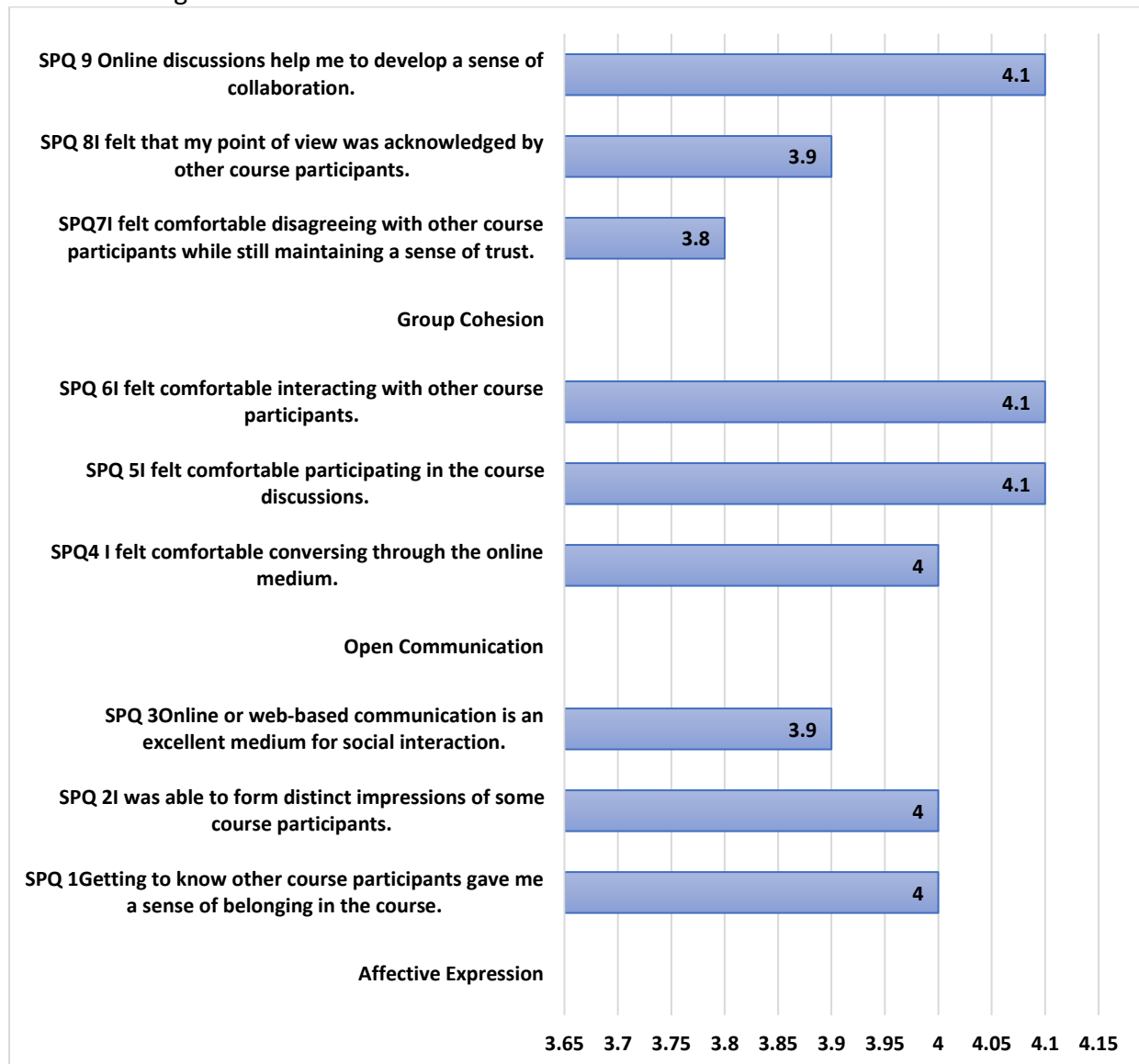


Figure 9- Mean for social presence

Figure 9 shows the mean for social presence. Three items share the same highest mean of 4.1 and they are; “ felt comfortable participating in the course discussions”, “felt comfortable interacting with other course participants”, and “Online discussions help me to develop a sense of collaboration”. This is followed by the mean of 4 for the items “1Getting to know other course participants gave me a sense of belonging in the course”, “was able to form distinct impressions of some course participants”, and “felt comfortable conversing through the online medium”.

Findings for Relationship between Teaching and Social Presence

This section presents data to answer research question 4: What is the relationship between teaching presence and social presence? To determine if there is a significant association in the mean scores between metacognitive, effort regulation, cognitive, social and affective strategies data is analysed using SPSS for correlations. Results are presented in table 3 below.

Table 3

Correlation between teaching & social presence

		TOTALTEACHING	TOTALSOCIAL
TOTALTEACHING	Pearson Correlation	1	.532**
	Sig. (2-tailed)		.000
	N	100	100
TOTALSOCIAL	Pearson Correlation	.532**	1
	Sig. (2-tailed)	.000	
	N	100	100

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

Table 3 shows there is an association between teaching and social presence. Correlation analysis shows that there is a high significant association between teaching and social presence ($r=.532^{**}$) 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 strong positive relationship between teaching and social presence.

Findings for Relationship between Teaching and Cognitive Presence

This section presents data to answer research question 5: What is the relationship between teaching presence and cognitive presence? This section presents data to answer research question 4: What is the relationship between teaching presence and social presence? To determine if there is a significant association in the mean scores between metacognitive, effort regulation, cognitive, social and affective strategies data is analysed using SPSS for correlations. Results are presented in table 4 below.

Table 4

Correlation between teaching & cognitive presence

		TOTALTEACHING	TOTALCOGNITIVE
TOTALTEACHING	Pearson Correlation	1	.581**
	Sig. (2-tailed)		.000
	N	100	100
TOTALCOGNITIVE	Pearson Correlation	.581**	1
	Sig. (2-tailed)	.000	
	N	100	100

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

Table 4 shows there is an association between teaching and cognitive presence. Correlation analysis shows that there is a high significant association between teaching and cognitive presence ($r=.581^{**}$) 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 strong positive relationship between teaching and cognitive presence.

Findings for Relationship between Cognitive and Social Presence

This section presents data to answer research question 6: What is the relationship between cognitive presence and social presence?

To determine if there is a significant association in the mean scores between metacognitive, effort regulation, cognitive, social and affective strategies data is analysed using SPSS for correlations. Results are presented separately in table 5 below.

Table 5

Correlation between cognitive & social presence

		TOTALCOGNITIVE	TOTALSOCIAL
TOTALCOGNITIVE	Pearson Correlation	1	.708 ^{**}
	Sig. (2-tailed)		.000
	N	100	100
TOTALSOCIAL	Pearson Correlation	.708 ^{**}	1
	Sig. (2-tailed)	.000	
	N	100	100

^{**}. Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows there is an association between cognitive and social presence. Correlation analysis shows that there is a high significant association between cognitive and social presence ($r=.708^{**}$) 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 strong positive relationship between cognitive and social presence.

Conclusion

Summary of Findings and Discussions

The findings revealed that the three variables: teaching presence, cognitive presence and social presence have positively impacted students in their online learning experience. Firstly, learners mentioned that teaching presence influences a positive online learning experience when the instructor communicated explicitly and thoroughly in ensuring the learners are well-aware with the course goals, course learning activities and time frames. Instructors' roles as

facilitators in the online classroom medium plays a pivotal element in creating a conducive environment for the learners to participate in a meaningful learning experience that relies heavily on the learners' engagement and elements of interactions with the instructor. In contrast, Zulfikar (2019) stated that compared to a strategy that just focused on discussion forums on issues introduced by instructors, this one emphasises the importance of instructors and their presence (teacher-led discussion). Research on student-driven online networks is sparse. Earlier research indicated that students would rather have peers' moderate online conversations than lecturers, and that when students took on this role, they engaged more frequently and posted more messages per week than when instructors led the discussions. Online discussions guided by peers resulted in increasingly in-depth contributions.

Secondly, cognitive presence is a critical term for describing the emergence of ideas over time in online inquiry-based interactions. The majority of studies measuring and evaluating cognitive presence have utilised self-report instruments or quantitative content analysis. Instructors required improved methods to evaluate the cognitive development of their students and design suitable coaching sessions. The findings in this study revealed that synthesizing and utilising information learnt during the online course provided a pathway for the learners to learn skills such as applying the knowledge obtained in real-life situations and producing solutions to overcome issues or a problem encountered. Previous study by Ba (2022) supported this view that instructors can now provide swift and accurate solutions to student inquiries regarding their cognitive presence phase progression. In addition, her research contributes to the expanding body of literature on the capability of learning analytics to track student development and enhance theory-based knowledge evaluations.

Furthermore, this study reveals the importance of social presence affecting a positive online learning experience. Engagement between peers enhances collaborative learning and learners reported that a sense of comfortableness is essential in ensuring an optimum environment in an online learning course. Killis (2019) supported this view by stating that students' efforts, self regulation, the presence of a warm and comfortable learning environment, the instructor's effort and supervision, and the students' innate qualities may all contribute to a high level of social presence. Previous studies concentrated primarily on college students, who may have stronger self-control but poorer socialisation. Yet, it is reasonable to believe that both students and teachers contributed to the development of students' sense of social agency. Throughout the course of the semester's discussion activities, students' preferences for the helpful actions of their professor and peers emerged. By performing acts of kindness that expand students' options for self-expression and transparency, a teacher can support the openness and sense of community of their pupils. They can make it simpler for children to participate, ask questions, and feel at ease in the classroom and beyond. Classmates' acts of kindness may similarly enhance students' sense of community, communication, and collaborative work both inside and outside of the classroom, which may have a positive effect on students' social presence.

Through this study, it can be concluded that the relationship between the three variables are proven to be positive. Therefore, a positive online learning experience could be with a balance of teaching, cognitive presence, and social presence to facilitate effective learning.

(Pedagogical) Implications and Suggestions for Future Research

The exploration of the relationship between teaching, cognitive presence, and social presence in online learning has important implications for the design and delivery of online courses. The findings of this study suggest that online learning environments require a balance of

teaching, cognitive presence, and social presence to facilitate effective learning. Teachers should be trained to use online tools and platforms effectively to increase cognitive and social presence in their online classes. Future research should examine the impact of teaching, cognitive presence, and social presence on student learning outcomes, explore the role of online tools and platforms in facilitating cognitive and social presence, and investigate the effectiveness of different approaches to training teachers and instructors in online learning environments. Additionally, future research could examine the relationship between teaching, cognitive presence, and social presence among different student populations, bigger sample size, and in different online learning contexts.

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