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SOCIAL PRESENCE, CONSTRUCTS OF SOCIABILITY AND SOCIAL SPACE IN COMPUTER-MEDIATED ONLINE LEARNING

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Abstract

This study aims to look at the relationships between social presence, sociability, social space constructs and satisfaction in computer-mediated online learning. This study is quantitative in nature and uses factor analysis, namely Principal Component Analysis using Varimax rotation and Pearson's Bivariate Correlation to reveal the relationship between the three variables and satisfaction with learning online. The respondents in this study were 320 undergraduate students from the Islamic University of North Sumatra (UISU), Indonesia. The results show a significant relationship among the variables of the study at different levels. The findings of the study also indicate that, among the three variables, sociability has a high correlation with satisfaction with computer-mediated learning. The study concludes that in computer-mediated online learning, a conducive environment that leads to student learning satisfaction must promote the felt presence of group members (social presence), encourage interactivity (sociability), and promote positive group cohesion (social space). Further studies should be conducted to determine whether pedagogical techniques, gender, and age have a bearing on the outcomes of the three variables of the study.

1. Introduction

Creating positive social interaction is an important human communication need. This requirement extends to online learning environments too. Studies have shown that active online interaction increases the construction of new knowledge (Shanthi et al., 2017; Shanthi et al., 2019; Zhao & Jiang, 2010). Computer-mediated online learning is one of the Internet-based learning activities that allow students to play a bigger role in the learning process (Saifuddin, 2018). In computer-mediated online settings, social interactions are often described by one's perceptions of the presence of others (Akcaoglu & Lee, 2016).

A challenge that arises related to online lectures is to determine the right virtual environment for the best outcome of online learning so that it can achieve similar learning outcomes to those in face-to-face lectures. Currently, most computer-mediated online learning classes are carried out via video conferencing applications which allow educators and students to interact directly as though they are meeting face-to-face (Wijaya & Hamidah, 2020). Research in computer-mediated online learning has shown that besides better academic performance (Wijaya & Hamidah, 2020), student participation is much higher when lecturers encourage students to speak. One way to encourage students to speak is by throwing open-ended questions that encourage students to respond by sharing their thoughts; such questions produce possibilities and promote discovery and greater understanding of the subject matter taught online (Shanthi et al., 2019; Shanthi et al., 2021).

There are many challenges in computer-mediated online learning (Wijaya & Hamidah, 2020). Among the challenges faced by students at UISU is unstable Internet signal strength which results in difficulties in joining or following the online classes that lead to reduced online interaction that affects the three variables of this study. To overcome these two challenges, applications such as WhatsApp which is hand phone friendly are mainly used (Wijaya & Hamidah, 2020). This lightweight application also allows interactions via chats and information sharing among students and between students and their teachers (Najafi & Tridane, 2015).

Computer-mediated online learning could increase social presence in learning (Zhafira et al., 2020). Social presence is the ability of participants to identify themselves in their classroom environment, communicate purposefully in an environment of mutual trust, and develop interpersonal relationships by projecting each other's personalities (Shanthi et al., 2018). Social presence in online learning is enhanced by the expression of emotions, humour, and self-disclosure, which in turn encourages sociability supported by positive group cohesion (social space). This study hopes to establish that higher social presence, sociability, and a social space higher in positive group cohesion will lead to satisfaction in students who are learning in a computer-mediated environment.

This study aims to seek responses to the following hypotheses:

H1: Computer-mediated online learning environments higher in perceived sociability will increase the likelihood of the establishment of sound social space.

H2: Computer-mediated online learning environments higher in perceived sociability will increase the degree of perceived social presence.

H3: A higher perceived social presence will increase the likelihood of the establishment of sound social space.

H4: A higher perceived social presence will increase the likelihood of student satisfaction in computer-mediated online learning.

H5: A higher perceived social space will increase the likelihood of student satisfaction in computer-mediated online learning.

H6: A higher perceived sociability will increase the likelihood of student satisfaction in computer-mediated online learning.

1.1. Literature Review

Social presence is the interpersonal involvement (quality and state of being there) of two communicators using a communication medium (Short et al., 1976). Social presence is closely related to two other constructs namely sociability (a medium attribute) and social space (a group attribute) (Kreijns et al., 2021). Sociability refers to the capacity of computer-mediated communication (CMC) and other electronic platforms by which one could express, perceive, and experience another person's presence, which then, might foster the socio-emotional aspects of the learning experience. Next, social space refers to the network of interpersonal relationships in online group learning) which portrays the sense of community in which psychological phenomena such as group climate, social identity, mutual trust, and group cohesion could be detected.

Social presence is also defined as the degree and the effect of the prominence of others' presence in the interaction of interpersonal relationships. The quality of social presence is seen from the degree of salience of the participants in the interpersonal relationship. The quality itself may vary by the communication media. Factors such as facial expression, posture, and nonverbal clues also contribute to the degree of social presence (Gunawardena, 1995). It is also posited that social presence is related to the learners' satisfaction with the course and the instructor at the times they are learning (Lowenthal, 2009). When a positive degree is established, a positive affective relationship will form (sociability), and finally learning outcomes and learning satisfaction will be achieved and task accomplishment could be enhanced (Kreijns et al., 2021). In addition to this, there is a positive relationship between social presence and learning satisfaction in online classes in which students with high levels of social presence are more likely to own a high level of learning satisfaction (Nasir, 2020).

The degree of social presence might be influenced by factors such as age, gender, year of study, college major, and computer literacy level (Mathews & Lelanie, 2020). It was found that age affects learning satisfaction in online classes (Nasir, 2020). Another research concluded that female students have more potential to create a positive degree of social presence than male students because female students were more aware of the presence of other participants whom they treated as friends while male students were not conscious of their views in the online forum. Therefore, male students tended to use more 'crude and harsh' language, while female students would use more 'polite and friendly' language (Thayalan et al., 2012).

However, Shanthi et al. (2022), discovered that online social presence is not related to gender but is related to three other aspects namely interactivity, online communication, and social context. The study found that online social presence is enhanced by interaction when teachers assign task-oriented work, however, negative group cohesion such as personal attack and dominance decreases social-oriented

(sociability) in their social relationships. Studies have revealed that shyness could affect the sociability of learning activities (Singh & Singh, 2017). Apart from that, the existence of a partner's image was found to enhance the consciousness of natural communication, and this indirectly promotes self-correction as one of the learners' learning performances (Yamada, 2009). The size of the group was found to be a contributing factor to social space, sociability, and social cohesion too (Akcaoglu & Lee, 2016). It was posited that smaller groups and a higher number of interactions to follow could improve the ability to work together and develop better personal impressions of group members. These in turn enhance the perceptions of sociability in the online class environment.

Educators should also consider the degree of interaction integration in the learning scenarios (Weidlich et al., 2022). Ritonga et al. (2022) concluded that utilizing the latest online learning platforms and methods that are varied, meaningful, interactive, and fun could potentially bring out the maximum social presence of educators or learners and this strong social presence could foster learners' high-quality learning achievement in both cognitive and affective aspects. However, Mathews and Lelanie (2020) found no relationship between students' levels of social presence, preferred synchronous tools, and learning performance. The social presence of the students does not affect their learning performance and their preferred synchronous tool.

2. Research Methods

A cross-sectional, questionnaire-based research approach was used in this study to evaluate the association between social presence, sociability, and social space and online learning satisfaction among undergraduates at Universitas Islam Sumatera Utara (UISU) in Indonesia. Students attended online classes for a semester. At the end of the semester, an online questionnaire was distributed to collect data on the students' perceived experience of learning in computer-mediated online learning. The questionnaire was adapted from Kreijns et al. (2004). It contained four parts – Part A (demographic questions), Part B (questions on social presence), Part C (questions on sociability), and Part D (questions on social space).

2.1. Participants

Data were collected from students from a public university who were taking up various courses (see Table 1) in a fully online mode. The online questionnaire was shared with students after they had completed their course at the end of the semester and three hundred and twenty responses were received 163 (50.9%) male and 157 (49.1%) female).

Table 1. Respondents Based on Faculties

Faculty	Respondents	
	Number	%
Economy	65	20.3
Laws	38	11.8
Religious studies	0	0
Literature	51	15.9
Education and Teacher Training	0	0

Social Science and Politics	52	16.3
Agriculture	101	31.6
Medicine	12	3.8
Engineering	1	0.3

2.2. Research Framework

The research framework suggests several relationships between the constructs of sociability, social presence, and social space. These relationships are subsumed in a model of relationships as seen in Figure 1. The framework emphasizes the promotion of sociability and positive group cohesion in social space in a computer-mediated learning environment because it complements social presence that emphasizes communication and collaboration in the learning environment. Adding social space as a variable in the model acknowledges the need to create a conducive virtual learning environment in which the students can interact with other group members and the learning activities, they carry out are determined by the level of sociability which is equally important.
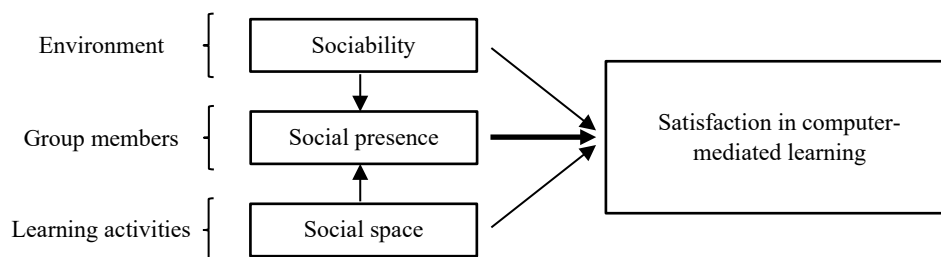

Figure 1. Research Framework

3. Findings

The factor analysis (Principal component analysis using varimax rotation) was done on the seven test items of the refined sociability scale, the five test items of the social presence scale, and the eleven test items of the social space scale. The extraction was restricted to only four factors because the purpose of this analysis was not to reveal factors but rather to confirm the uniqueness of the scales concerning each other. Because the social space scale has two dimensions while the sociability scale and the social presence scale have only one respectively, the restriction was set to four. The factors explained 66.7% of the total variance.

The social presence scale consists of 5 items as shown in Table 2. However, item number five, "Real-time conversations in this ODL environment can hardly be distinguished from face-to-face conversations" produced a low factor score. It shows that item number five does not measure the dimension of social presence and needs to be excluded. The dimension with item number five tends to lower the reliability of the measurement (Cronbach alpha), from 0.861 to 0.758 (refer to Table 5). Hence, in this study item, number five is removed from measuring the social presence scale.

Table 2. Social Presence Scale

No of item	Item	Mean	Standard Deviation	Factor Social Presence
Q1	When I have an online conversation, I have my communication partner in my mind's eye.	4.83	1.53	0.776
Q2	When I am chatting online, I have my communication partner in my mind's eye.	4.83	1.46	0.815
Q3	When I have an online conversation, I feel that I am dealing with very real persons and not with abstract anonymous persons.	5.01	1.52	0.707
Q4	When I have an online conversation, I feel that I am dealing with very real persons and not abstract anonymous persons.	4.97	1.66	0.562
Q5	Online chatting/conversation can hardly be differentiated from face-to-face conversation in an online environment.	4.67	1.73	0.479

Table 2 presents the sociability scale which consists of 7 items. However, two items (Q1 and Q2) in the Sociability scale need to be excluded due to low factor scores. A low factor score implies that the item does not measure the construct correctly. The Cronbach alpha with all items included is 0.822. When the items of Q1 and Q2 are removed, the reliability increases to 0.876 (refer to Table 5).

Table 3. The Sociability Scale

No of item	Item	Mean	Standard Deviation	Factor Sociability
Q1	The online learning environment enables me to easily contact my teammates.	5.15	1.49	0.313
Q2	I do not feel lonely learning in the online learning environment.	4.48	1.97	0.208
Q3	The online learning environment enables me to get a good impression of my teammates.	4.56	1.74	0.740
Q4	The online learning environment enables us to develop into a well-performing team.	4.43	1.76	0.777
Q5	I am satisfied with the online learning environment.	4.66	1.79	0.784
Q6	The online learning environment allows for non-task related conversations.	4.60	1.65	0.426
Q7	The online learning environment enables me to make close friendships with my teammates.	4.33	1.83	0.734

The social space scale consists of 11 items as depicted in Table 3. The first seven items measure the social space for positive group behaviour. Another four items measure the social space for negative group behaviour. All items produced factor scores more than 0.4 with high consistency where the Cronbach alpha for both constructs are 0.925 and 0.807 respectively (refer to Table 4).

Table 4. The Social Space Scale

No of item	Item	Mean	Standard Deviation	Reliability score Positive group behaviour	Reliability score Negative group behaviour
Q1	Group members felt free to criticize the ideas, statements, and/or opinions of others.	5.17	1.55	0.578	
Q2	We reached a good understanding of how we	4.99	1.61	0.638	

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	had to function in group work.				
Q3	We worked hard on the group assignment.	5.39	1.55	0.796	
Q4	I maintained contact with all other group members.	5.42	1.52	0.750	
Q5	The group conducted open and lively online conversations and discussions.	5.07	1.60	0.753	
Q6	Group members took the initiative to get in touch with others.	4.99	1.59	0.748	
Q7	Group members asked others how the work was going.	5.13	1.55	0.706	
Q8	Group members felt that they were attacked personally when their ideas, statements and/or opinions were criticized.	4.22	1.83		0.797
Q9	Group members grew to dislike others.	3.63	1.95		0.863
Q10	I did the lion's share (most work) of the work.	4.93	1.65		0.521
Q11	The group had conflicts.	3.94	1.94		0.806

Table 5. Reliability Statistic

	Cronbach's Alpha	N of Items
Social Presence	0 .861	4
Sociability	0.876	5
Social Space		
*- Positive group behaviou*r	0.925	7
*- Negative group behaviou*r	0.807	4

Pearson's correlation coefficient is a measure of linear association between two variables. Table 5 depicts Pearson's Bivariate Correlation Coefficients between social presence, sociability, satisfaction towards online learning, and satisfaction towards gadgets and social space for 320 respondents. There are high and significant relationships between social presence with sociability and social space for positive group behaviour and also sociability with satisfaction towards online learning and social space for positive group behaviour. Moderate and significant relationships are found between social presence with satisfaction towards online learning and satisfaction towards gadgets as well as satisfaction towards online learning and social space for positive group behaviour.

Table 6. Pearson's bivariate correlation coefficients between social presence, sociability, and social space

	Social Presence	Sociability	Satisfaction towards online learning	Social Space	
				Positive group behaviour	Negative group behaviour
Social Presence	1	0.722**	0.633**	0.712**	0.222**
Sociability		1	0.731**	0.745**	0.474**
Satisfaction towards online learning			1	0.686**	0.457**
Social Space: *Positive group behaviour*				1	0.523**
Social Space: *Negative group behaviour*					1

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

With the correlation between the various factors determined (see Table 6), the following conclusions are made:

1. There is a positive correlation between perceived sociability and social space. As such hypothesis 1 - Computer-mediated learning environments higher in perceived sociability will increase the likelihood of the establishment of sound social space is accepted.

2. The correlation coefficient between social presence and sociability is 0.722. With this, hypothesis 2 – Computer-mediated learning environments higher in perceived sociability will increase the degree of perceived social presence is accepted.

3. There is a high correlation between perceived social presence and social space therefore, Hypothesis 3 – A higher perceived social presence will increase the likelihood of the establishment of sound social space is accepted.

4.the high correlation of 0.633 between social presence and student satisfaction towards online learning also means that hypothesis 4 – A higher perceived social presence will increase the likelihood of student satisfaction in computer-mediated online learning is accepted.

5. The correlation coefficient of 0.686 between student satisfaction towards online learning and social space also means that hypothesis 5 – A higher perceived social space will increase the likelihood of student satisfaction in computer-mediated learning is accepted.

6. The correlation coefficient between perceived sociability and student satisfaction in computer-mediated learning is at 0.731, therefore hypothesis 6 – A higher perceived sociability will increase the likelihood of student satisfaction in computer-mediated learning is also accepted.

In addition, it was also found that there is a moderate and significant relationship between social presence and satisfaction with online learning. The relationship between satisfaction with online learning and social space for positive group behavior is significant too.

The findings of this study are summarised in Table 7.

Table 7.   Summary of Findings

High Correlation		
Social Presence	⟶	Sociability
	⟶	Social Space (positive group)
Sociability	⟶	Satisfaction towards online learning
	⟶	Social Space (positive group)
Moderate Correlation		
Social Presence	⟶	Satisfaction towards online learning
Social Space (positive group)	⟶	Satisfaction towards online learning.

The study affirms the findings of Weidlich et al. (2022), whose findings stated that the degree of interaction in the learning scenarios enhances integration in virtual classroom environments. Only when the presence of other students is felt, when they interactively ask and answer questions, and interact with respect to the feelings of fellow students, can bring about satisfaction to learning in a computer-mediated learning environment. Table 7 also highlights the importance of encouraging positive group cohesion in a computer-mediated learning environment, both the variables of social presence and sociability have a

high correlation with positive group cohesion in social space. This finding is in line with Akcaoglu and Lee (2016), and Shanthi et al. (2022), both these studies stressed the importance of using politeness strategies while interacting with group members. Another outcome of the study also indicated that social space where there is positive group cohesion is only moderately correlated to satisfaction with online learning. This indicates that, that the felt presence of others (social presence) and the opportunity for learners to socialize with their peers, and teachers have a positive significant impact on the learners' satisfaction with learning online compared to the way students interact online. Hence, it can be concluded from Table 7 that, a combination of high social presence, and active sociability where positive group cohesion is achieved, increase satisfaction toward online learning. This study is significant in that it examined the virtual environment from three aspects; social presence, sociability, and social space to promote a better online learning experience and has posited that interaction in online learning often translates to students' engagement in their academic activities before positively affecting students' satisfaction.

4. Conclusion

The study seeks to understand the relationships among social presence, sociability, and social space constructs in computer-mediated online learning. Although the analysis of the survey shows a significant relationship between social presence with sociability and social space for positive group behaviour, and also between sociability with online learning satisfaction and social space for positive group behaviour. Therefore, the overall data gathered from the participants generally paints a positive picture of satisfaction with online learning and the three dependent variables of social presence, sociability, and social space for positive group behaviour.

Al-khresheh (2022) and Al-Arif et al. (2022) reviewed several studies on propagating conducive student-centred learning conditions in English as a foreign language classrooms from teachers' perspectives. This includes working on students' ICT literacy, ICT skills, motivation, and positive attitudes towards the use of ICT in English learning activities as the Internet increases the students' engagement and motivation (Fatiha et al., 2014). Meanwhile, Jacobs and Renandya (2016) presented ten elements of student-centred learning. Therefore, this could be an area to further look into in computer-mediated online communication.

Aljohani (2017) posits that the constructivist approach emphasises that students can be more motivated to learn EFL when they construct meanings that are more relevant to real life in enjoyable, interesting, and meaningful computer-mediated online communication.

On further analysis of the four major attributes, some concerning aspects have emerged from this survey. Moreover, the influence of variables such as social presence, sociability, satisfaction with online learning, and social space towards promoting a student-centred approach in the Indonesian EFL context have also been put under the lens of this study. After all, learners' autonomy is considered critical in encouraging a student-centred EFL teaching approach (Godwin-Jones, 2019).

A promising result from this study revealed that the students responded positively between sociability and satisfaction with online learning and social space for positive group behaviour. Another notable aspect that provides language learners with more opportunities to be exposed to the EFL language

both inside and outside the classroom through the technology-integrated mechanism can be found in flipped instructions (Bergmann & Sams, 2012 as cited in Ravanpour, 2022). He further argued that technology-based instruction can increase students' engagement.

Further studies need to be undertaken on this subject the role played by factors like gender, location, and status of the school and class size in determining the teachers' perception regarding student-centred learning was also studied. Another area for future studies should also be conducted to find out which of the pedagogical techniques; namely teacher-centred, learner-centred, or learning-centred pedagogy brings out the maximum social presence, sociability and social space that could foster high-quality learning achievements in computer-mediated learning environments.

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