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Examining Key Determinants of Social Presence and Satisfaction in Online Learning: An Exploration with Undergraduate Student

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Abstract

The increasing popularity of online learning and its associated technology in higher education, particularly due to the COVID-19 pandemic, has garnered significant attention worldwide. This study focuses on investigating and developing the construct of social presence and its relationship with satisfaction in computerized learning environments. The study explores various dimensions of social presence, including social respect, social sharing, open communication, and social navigation, and their impact on satisfaction in online learning. The findings demonstrate that social presence plays a significant role in influencing satisfaction, and a statistically significant correlation exists among the observed variables. The implications of these results are important for higher education institutions, instructional designers, instructors, and learners. This study also provides valuable theoretical foundations for further discussions on social presence and satisfaction in online learning. To effectively meet learners' expectations and enhance social presence and satisfaction, higher education institutions offering online programs should understand their learners' needs. Instructors can contribute to learners' engagement and success by strategically incorporating instructional course designs, arranging materials, and generating clear learning activities that enhance social presence. By providing a high level of social presence in online learning environments, instructors can promote student satisfaction and facilitate effective comprehension of learning materials.

Introduction

Online learning platforms have gained widespread acceptance in tertiary education worldwide as a cost-effective and convenient method of delivering education. This approach offers learners numerous opportunities to pursue their education in diverse settings (Bates & Poole, 2003; Allen & Seaman, 2010). In response to the COVID-19 pandemic, universities and higher education institutions have increasingly prioritized online teaching over traditional classroom instruction, aiming to minimize face-to-face interactions. To facilitate this shift, familiarity with digital tools such as computers, laptops, mobile phones, and internet connectivity has become essential for both instructors and students, as they can help alleviate the challenges associated with teaching during the

pandemic (Wut & Xu, 2021). Consequently, both synchronous and asynchronous communication methods have proven viable and effective in promoting students' academic success (Nieuwoudt, 2020)

The concept of social presence, encompassing effective communication, open communication, and group cohesion, has been extensively discussed in the context of online and computerized learning environments by Garrison (2007). Some argue that computerized learning environments fail to produce the same outcomes as traditional classrooms due to the lack of face-to-face interaction. Furthermore, several studies have indicated that online learning lacks social presence, resulting in a lack of community (Rovai, 2002; Kear et al., 2014; Poquet et al., 2018). Consequently, social presence and satisfaction levels are closely associated with online learning, particularly considering the substantial differences between online and face-to-face learning methods.

The instructor-learner interaction plays a pivotal role in promoting effective classroom instruction and fostering a sense of togetherness in the class (Aragon, 2003). Social presence is crucial for facilitating successful group communication along with cognitive presence, which involves exploration, construction, critical thinking, and practical learning (Salmon, 2004). However, establishing social presence between instructors and students in online environments remains challenging (Wut & Xu, 2021). University students, including undergraduates, postgraduates, and non-traditional students (NTS) aged 25 or over, commonly participate in online learning through distance education. These individuals often juggle their roles as students with the responsibilities of supporting their families, such as employment or other social commitments. In Indonesia, while NTS have the option to pursue further studies at universities, only a few institutions offer dedicated distance-learning programs. The Indonesia Open University stands out as a suitable choice for those seeking to balance work, family responsibilities, and higher education, as it offers flexible courses that accommodate their schedules.

Amid rapid technological advancements, extensive research has focused on social presence and satisfaction within online learning platforms. However, limited attention has been given to students' learning behaviors and responses specifically in relation to social presence and satisfaction, particularly since the outbreak of COVID-19 when students have been compelled to adapt to online academic activities (Adedoyin & Soykan, 2020). Therefore, our study aims to examine four sub-components of social presence and satisfaction. The study focuses on Indonesian undergraduate students due to the challenges faced by the country in implementing online learning, particularly regarding inadequate ICT network infrastructure (Harto, 2020).This paper presents a research model with second-order components and emphasizes the functions of social presence, including social respect, sharing, navigation, and openness in communication, as well as satisfaction factors such as learner interface, interaction with instructors, personalization, content, and course quality in online learning. Furthermore, the study identifies, validates, and examines the relationships among all sub-dimensions of social presence and satisfaction constructs.

Literature Review

Social presence, initially introduced by Short et al. (1976), refers to the degree of salience of the other person in the interaction and the resulting salience of interpersonal relationships. While the concept originated in telecommunications studies, it has evolved to encompass online learning. Over time, the definition has been

refined to describe the extent to which a person is perceived as a real person in mediated communication. Research on social presence in online learning has expanded to include broader concepts and dimensions. Social presence is widely viewed as the interactions between an instructor and their students, playing an essential role in instructional efficacy and building a sense of community.

The theory of social presence is widely employed to describe how learners socially interact with one another in online learning environments. Cobb (2009) identified three categories of social presence: emotional expression, communicational openness, and group cohesion. Numerous researchers have reported that improved student interaction in online learning enhances social presence (Tu & McIsaac, 2002; Zhao et al., 2014; Poquet et al., 2018).Social presence is vital in engaging and enhancing instructor-learner interactions in online learning. Increasing social presence fosters more active and realistic interactions between instructors and learners, as well as among learners and their peers. In online learning environments, where traditional signifiers such as mutual gaze, voice tone, physical contact, and facial expressions are absent, building a genuine community becomes a challenging endeavor (Gunawardena & Zittle, 1997).

Several dimensions and factors contribute to the exploration of social presence. Yen and Tu (2011) categorized social presence into dimensions such as social setting, virtual interaction, collaboration, and secrecy. Sung and Mayer (2012) emphasized that the social setting is constructed through computer-mediated communication (CMC) and learners' perceptions of CMC or the online learning situation. Kim (2011) identified five factors that influence social presence, including reciprocal attention, assistance, emotional interconnectedness, sense of community, and openness of interaction. Additionally, social respect, sharing, identity, open-mindedness, and intimacy are elements of social presence in online learning (Sung and Mayer, 2012).

Discussing social presence in online learning can be complex and requires effort from course designers, instructors, and participants (Aragon, 2003). Affective expression plays a prominent role in the initial stages of social presence development, encompassing aspects such as belongingness, impressions toward the lesson, open communication, and group cohesion related to trust and collaboration (Poquet et al., 2018). The significance of sociability has been underscored by Akcaoglu and Lee (2016), as it creates an effective social space where learners trust each other and feel connected to the group.

Table 1 provides an overview of the factors pertaining to social presence in online learning highlighted in different studies, including the present study. Factors identified by various researchers include course design, instructor strategies, participant strategies, social context, online communication, interactivity, privacy, affective connectedness, open communication, collectiveness, mutual attention and empathy, interdependent support, social sharing, open-mindedness, social identity, intimacy, sociability, social space, cohesion, affective expression, and social navigation (present study).

In Indonesia, the factors highlighted in the present study are imperative to discuss, especially considering the widespread shift to online learning. Many Indonesians still have doubts about the quality and inequality in access to online learning, perceiving a lack of social respect, social sharing, social navigation, and open communication

(Berliyanto & Santoso, 2018). Developing countries, including Indonesia, face challenges in implementing online learning due to the instability of ICT networks and issues with the quality of online learning systems (Harto, 2020).

Table 1. Factors of Social Presence Highlighted in Different Studies

Author	Factor
Aragon (2003)	Course design, instructor strategies, and participant strategies
Yen and Tu (2011)	Social context, online communication, interactivity, and privacy
Kim (2011)	Affective connectedness, open communication, collectiveness, mutual attention and empathy, and interdependent support
Sung and Mayer (2012)	Social context, social sharing, open mindedness, social identity, and intimacy
Akcaoglu and Lee (2016)	Sociability, social space, and cohesion
Poquet et al. (2018)	Affective expression, open communication, and group cohesion
Present Study	Social respect, social sharing, open communication, and social navigation

Satisfaction in Online Learning

The theory of learning satisfaction, initially introduced by Argyris (1960) to assess employee satisfaction in the workplace, has significant implications for educational environments, particularly online learning. Researchers have expressed different views on learning satisfaction, with some linking it to student satisfaction and perceptions (Soon et al., 2000), while others emphasize its importance in determining online instruction quality (Allen & Seaman, 2010; Garrison & Cleveland-Innes, 2005). Satisfaction with teaching designs and online environments plays a crucial role in enhancing the quality of learning (Rubin et al., 2013), making student satisfaction a critical indicator of online program quality and success.

The learner interface is a major concern in online learning platforms, encompassing ease of use, user-friendliness, ease of understanding, and operational stability (Shee & Wang, 2008). Phirangee (2016) highlighted the lack of meaning, dialogue, selective listening, and attribution in the learner interface of online learning environments. Course structure also plays a vital role in learning satisfaction, relying on well-designed curricula, teaching materials (e.g., examples, exercises, multimedia applications), and effective organization (Yukselturk & Yildirim, 2008; Sun et al., 2008; Goh et al., 2017; Pham et al., 2019). Instructors must establish social presence through instructional course designs, materials organization, and clear direction of learning activities (Shea et al., 2005), with collaborative course design serving as the foundation (Yamagata-Lynch et al., 2015).

The following table 2 presents the factors influencing satisfaction identified in different studies, including the present study. Factors highlighted by various researchers include learner interface, learner community, system content, personalization, learner dimension, instructor dimension, course dimension, technology dimension, design dimension, environmental dimension, system quality, service quality, content quality, learner perspective, instructors' attitudes, supportive issues, course design, interaction with the instructor, interaction with peers, online

learning system quality, quality of online learning instruction and course materials, and quality of online learning administrative and support services (present study).

Table 2. Factors Influencing Satisfaction Identified in Different Studies

Author	Factor
Shee and Wang (2008)	Learner interface, learner community, system content, and personalization
Sun et al. (2008)	Learner dimension, instructor dimension, course dimension, technology dimension, design dimension, and environmental dimension
Ozkan and Koseler (2009)	System quality, service quality, content quality, learner perspective, instructors' attitudes, and supportive issues
Goh et al. (2017)	Course design, interaction with the instructor, and interaction with peers
Pham et al. (2019)	Online learning system quality, quality of online learning instruction and course materials, and quality of online learning administrative and support services
Present study	Learner interface, interaction with instructor, personalization, and content and course

In the present study, we focused on key factors of satisfaction in online learning, including learner interface, interaction with the instructor, personalization, and content and course. These factors were selected based on previous studies (Table 2). Careful consideration was given to ensure there was no overlap among the selected factors (see appendix). These factors represent the core elements of satisfaction in online learning in our study.

Methodology

Instrument

The present study employed a quantitative design and utilized a questionnaire for data collection to examine the relationships between social presence and satisfaction in online learning. Additionally, the study aimed to identify, validate, and examine the items and factors contributing to social presence and satisfaction in online learning. The research design employed a cross-sectional survey approach, collecting data at a single point in time. The data were collected through self-report surveys administered online.

The survey research process in this study followed several phases: (1) establishing an information base, (2) determining the sampling frame, (3) determining the sample size and selection procedures, (4) designing the survey instrument, (5) pretesting the survey instrument, (6) implementing the survey and computerizing the data, and (7) analyzing the data and preparing the final report. The questionnaires were administered electronically due to the distance constraints (Hair Jr et al., 2019). Online and paper-based questionnaires were used to collect the data. The participants responded to specific questions related to dimensions of social presence and satisfaction. The data attained from the questionnaires were analyzed using SPSS and AMOS version 22. Descriptive statistics were calculated using SPSS to summarize social presence and satisfaction in online learning. Pearson correlation

coefficients were used to examine the relationships among the measured variables. Confirmatory factor analysis was conducted using structural equation modeling (SEM) with the AMOS technique.

To ensure the validity and reliability of the questionnaire items, some survey items from previous studies were adapted for the current study. A two-stage conceptual validation process was employed, including unstructured sorting in round one and structured sorting in round two (Moore & Benbasat, 1991). Modifications were made to the wording of specific scale items to align with the scales used in previous studies. The participants' responses to the items were recorded on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Before administering the questionnaires to participants, three experts with expertise in developing online learning courses and conducting survey research reviewed the instrument for measurement error, validity, and reliability.

A panel of experts examined the constructed instrument to ensure content validity. The panel members possessed expertise in developing online learning courses and conducting survey research. Their input and feedback were considered in refining the questionnaire.

Participants

The study participants consisted of online learners enrolled in English language courses at a public university in Indonesia. The university branch offered undergraduate programs in Communication, English, and Management departments. The selection criteria for participants were as follows: (a) undergraduate students from any of the three departments and (b) students who had registered for English language courses and were active during the admission period. To determine the sample size, the approach recommended by Hair Jr et al. (2019) was utilized, which suggests a minimum sample size of ≥100 participants.

Table 3. Respondents' Demographics

Demographics	Frequency	Percentage (%)
Gender		
Male	22	18.60
Female	96	81.40
Major		
Communication	37	31.40
English	34	28.80
Management	47	39.80
Year of study		
I (Freshman)	26	22.00
II (Sophomore)	27	22.90
III (Junior)	26	22.00
IV (Senior)	29	24.60
>IV	10	8.50
Total	118	100

Results

Confirmatory Factor Analysis

Descriptive statistics, validity, and reliability were analyzed using a measurement model consisting of a social presence and satisfaction scale obtained through Confirmatory Factor Analysis (CFA). Furthermore, a Structural Equation Model (SEM) was employed to test the hypothesized relationships between social presence and satisfaction. The structural model demonstrated adequate model fit as indicated by the measurement of reliability and validity. Following the recommended criteria by Bagozzi and Yi (1988), the factor loadings in this study were assessed, ensuring they were neither too low (< .50) nor too high (> .95) to maintain meaningfulness.

Table 4. Results of the CFA Model; Construct Reliability and Validity for Social Presence in Online Learning

Item	FL	CR	AVE	CA
Social Respect (SR)				
SR1	0.66	0.92	0.68	0.92
SR2	0.82			
SR3	0.91			
SR4	0.93			
SR5	0.86			
SR6	0.73			
Social Sharing (SS)				
SS1	0.69	0.86	0.57	0.86
SS2	0.73			
SS3	0.81			
SS4	0.81			
SS5	0.71			
Open Communication (OC)				
OC1	0.75	0.88	0.60	0.88
OC2	0.73			
OC3	0.80			
OC4	0.83			
OC5	0.74			
Social Navigation (SN)				
SN1	0.71	0.81	0.52	0.80
SN2	0.77			
SN3	0.72			
SN4	0.67			

Note. FL = factor loading; CR = composite reliability; AVE = average variance extracted; CA= Cronbach's alpha

The measurement scale analysis in the present study demonstrated that all factors exhibited a Cronbach's alpha exceeding .70, meeting the criterion recommended by Nunnaly (1978). Specifically, the factors related to social

presence achieved Cronbach's alpha values above .70: SR = .92, SS = .86, OC = .88, and SN = .80. Similarly, the satisfaction items also surpassed the .70 threshold, with Cronbach's alpha values as follows: LI = .91, II = .88, PI = .88, and CC = .83. Overall, factor loadings ranged from .65 to .94. Consistent with the suggestion by Hair Jr et al. (2019), factor loadings exceeding 0.5 indicate a strong association between the item and its respective factors, suggesting high correspondence.

Table 5. Results of the CFA Model; Construct Reliability and Validity for Satisfaction in Online Learning

Item	FL	CR	AVE	CA
Learner Interface (LI)				
LI1	0.87	0.92	0.65	0.91
LI2	0.82			
LI3	0.81			
LI4	0.82			
LI5	0.84			
LI6	0.67			
Interaction with Instructor (II)				
II1	0.67	0.89	0.67	0.88
II2	0.86			
II3	0.94			
II4	0.78			
Personalization (PI)				
PI1	0.78	0.84	0.57	0.88
PI2	0.82			
PI3	0.78			
PI4	0.64			
Content and Course (CC)				
CC1	0.77	0.86	0.55	0.83
CC2	0.71			
CC3	0.73			
CC4	0.65			
CC5	0.84			

FL = factor loading; CR = composite reliability; AVE = average variance extracted; CA= Cronbach's alpha

Testing the Structural Model

To test the structural model, a bootstrapping analysis was conducted with 5000 subsamples at the 5% significance level. The study examined the relationship between social presence and satisfaction in online learning, considering social presence as a predictor of satisfaction. Initially, a measurement model was tested to assess whether the observed variables adequately indicated the latent variables and supported the construct validity of the measures, following the approach proposed by Anderson and Gerbing (1988). Subsequently, a structural equation model

was constructed and tested to explore the relationship between social presence and satisfaction.

The study also examined a second-order confirmatory factor analysis (CFA) model to investigate whether the four factors (social respect, social sharing, open communication, and social navigation) could be explained by a broader general factor of "social presence." Similarly, it was hypothesized that satisfaction would influence learner interface, interaction with the instructor, personalization, and content and course. These four factors were also expected to be explained by a general factor of "satisfaction" that could predict the measured items. The results of the second-order CFA for social presence and satisfaction in online learning are illustrated in Figure 1.

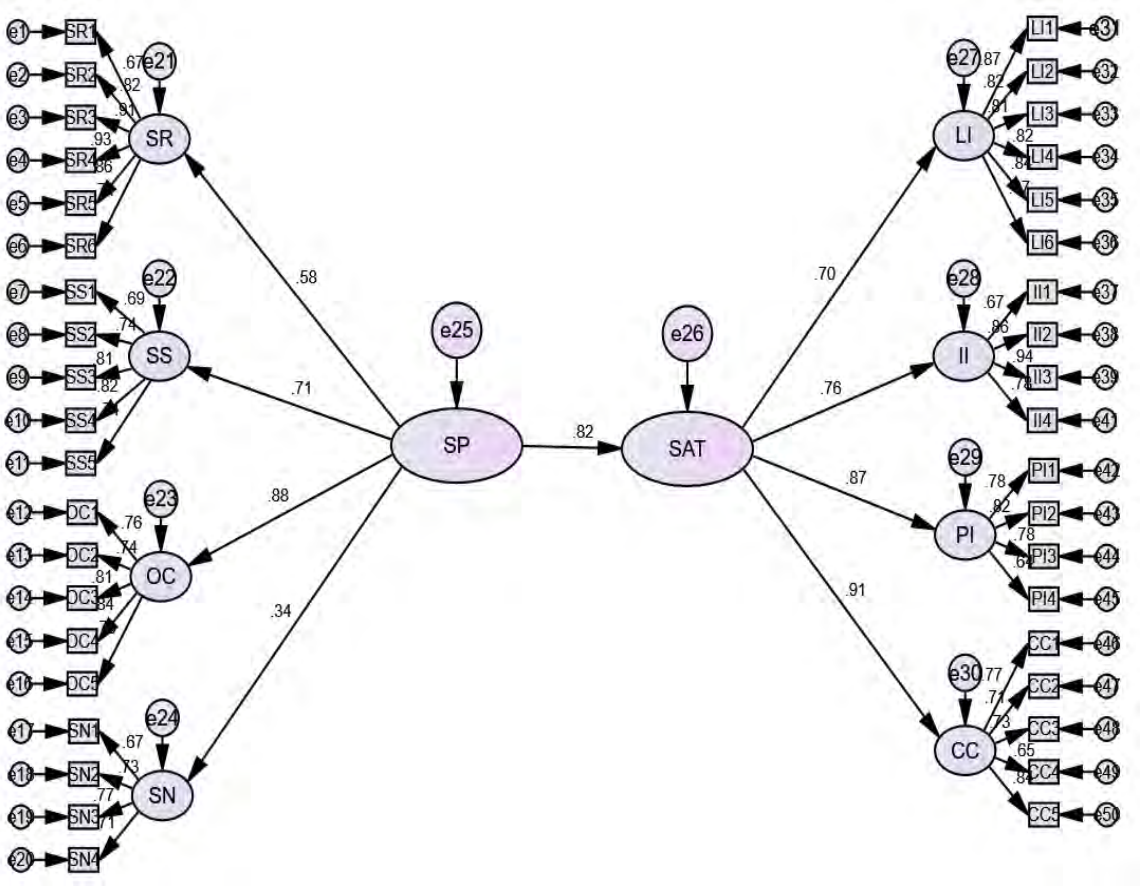

Figure 1. Results of Structural Model

Note. SP=Social presence; SAT=Satisfaction; SR=Social respect; SS=Social sharing; OC=Open communication; SN=Social navigation; LI=Learner interface; II=Interaction with instructor; I=Personalization; CC=Content and course

Table 6. Model Fit Results

Model fit parameters	Parameter estimates (value)	Threshold	Suggested by
χ^2/df	1.62	n≤3	Hair Jr et al. (2019)
Goodness of Fit (GFI)	.84	n>.80	Hair Jr et al. (2019)
Comparative Fit Index (CFI)	.84	n>.80	Hair Jr et al. (2019)
Tucker Lewis Index (TLI)	.83	n≥.83	Hair Jr et al. (2019)
Root Mean Square Error (RMSEA)	.07	n≤.08	Hair Jr et al. (2019)

The analysis of the correlation between social presence and satisfaction in online learning revealed a strong and positive relationship between these two variables. Specifically, social presence was found to have a significantly high correlation with satisfaction (r=.82), indicating that as social presence increased, satisfaction levels also increased. Moreover, all four sub-dimensions of social presence (SR, SS, OC, SN) exhibited positive and significant correlations with social presence, indicating that each sub-dimension contributed to overall social presence. Similarly, all four sub-dimensions of satisfaction (LI, II, PI, CC) showed positive and significant correlations with satisfaction, suggesting that each sub-dimension contributed to overall satisfaction. Furthermore, this study explored the relationships between each sub-dimension of social presence and satisfaction, yielding distinct findings.

Table 7. Correlations among Factors of Social Presence and Satisfaction in Online Learning

	M	SD	SR	SS	OC	SN	LI	II	PI	CC
SR	3.95	.76	1							
SS	4.36	.43	.37**	1						
OC	4.31	.41	.41**	.59**	1					
SN	4.04	.61	.33**	.21*	.34**	1				
LI	4.04	.61	.33**	.21*	.34**	.68**	1			
II	4.28	.47	.38**	.39**	.59**	.51**	.51**	1		
PI	4.05	.46	.33**	.43**	.56**	.61**	.61**	.58**	1	
CC	4.18	.45	.43**	.43**	.55**	.63**	.63**	.56**	.68**	1

*p < .05 **p < .01

Table 7 presents the mean (M) and standard deviation (SD) values for each dimension of social presence and satisfaction. Among the social presence dimensions, social sharing obtained the highest ranking, with an average score of 4.36 and a standard deviation of 0.43. On the other hand, social respect received the lowest ranking, with an average score of 3.95 and a standard deviation of 0.76. The correlation coefficients between the dimensions of both social presence and satisfaction were found to be significant and positive, ranging from 0.21 to 0.68. These results indicate that there is a meaningful relationship between each dimension and the overall constructs of social presence and satisfaction. Furthermore, all inter-factor correlations were also significant and positive ($\alpha = 0.01$), suggesting that the dimensions of social presence and satisfaction are interconnected. Additionally, a significant correlation was observed between social sharing and social navigation, as well as between social sharing and learner interface ($\alpha = 0.05$). These findings suggest that social sharing plays a role in influencing social navigation and learner interface within the online learning environment.

Discussion

This study makes a significant contribution to the existing literature by identifying and validating the four factors associated with online social presence and satisfaction in higher education online learning environments, based on the experiences of online learners. Confirmatory Factor Analysis (CFA) was employed to assess the statistical factor structure of the social presence and satisfaction scales used in online learning. Following Ullman's (2006)

suggestion that factors should have a minimum of three indicators or items, each factor in this study consisted of 4 to 6 items. In the context of online learning, the establishment of mutual respect between learners and instructors is paramount. Consequently, social respect plays a vital role in facilitating meaningful interactions, particularly in student-instructor relationships where social respect is involved. Similarly, social presence and open communication are indispensable elements that can enhance learners' motivation in the online learning environment. Moreover, open communication can effectively enhance learners' comprehension of the course content, as students experience a sense of presence when engaging in conversations with their instructors and peers. Furthermore, social navigation can enhance social presence as a means of influencing fellow learners and enhancing their knowledge and performance in online learning (Lin, 2004). For example, online instructors and peers can provide encouragement for learners to pursue additional work. Thus, the presence of social respect, social sharing, open communication, and social navigation in online learning fosters effective two-way communication, leading to reliable relationships and interactions between instructors and learners.

In addition to social presence, satisfaction emerges as a pivotal factor in the realm of online learning. In any educational process, the learner undoubtedly assumes a central role. As elucidated by Phirangee (2016), the learner interface within online learning environments often lacks meaningfulness, comprehensive dialogue, selective listening, and attribution. Furthermore, Vonderwell and Zachariah (2005) asserted that students' technological competencies and discussions concerning interface design have an impact on their levels of engagement and overall learning outcomes in online learning environments. Hence, the utilization of technology significantly influences students' attention within online learning platforms. It is plausible that certain students may lack familiarity with the online learning platform, while others may encounter challenges in navigating the technological aspects.

Certain students may exhibit limited proficiency in online learning, indicating that despite having some prior experience with online social technologies, they may struggle to effectively utilize these tools. As a result, it becomes the responsibility of instructors to facilitate the learning process seamlessly, with the ultimate aim of achieving specific learning outcomes. In this regard, instructors can prioritize increased interaction with students, as it is widely recognized that interaction plays a crucial role in fostering effective student learning within online courses (O'Leary & Quinlan, 2007). Additionally, instructors should provide guidance to learners in order to help them attain their learning objectives by enhancing their satisfaction with the course design, resources, and activities in the online learning environment. Such efforts can afford students the confidence to communicate and potentially increase their engagement. For instance, instructors can significantly bolster student participation by leveraging online platforms. Consequently, future virtual educational classrooms should capitalize on the flexibility offered by technology, enabling students to participate in manners that align with their individual comfort levels (Tackie, 2022).

This study presents a comprehensive exploration of students' engagement in online learning, examining both their experiences and the levels of satisfaction reported by both students and instructors. Personalization assumes a critical role within the learning process as it empowers learners to tailor their educational approach according to their individual needs. The feedback provided by learners regarding the learning content and courses holds

substantial value, serving as a valuable reference for instructors and potentially enhancing their teaching methodologies. Undoubtedly, online learning presents learners with diverse avenues for networking, learning tools, and opportunities for social interaction. Furthermore, online learning courses offer the advantage of a more flexible learning schedule. Hence, it is imperative that the content and design of online courses are informative, useful, well-planned, and aligned with the specific needs of students (Wang, 2003; So & Brush, 2008). Additionally, the degree of social presence in online learning exhibits a strong correlation with the level of satisfaction experienced by students. Higher levels of social presence in the learning environment tend to be associated with greater satisfaction. Thus, social presence assumes a pivotal role in determining the overall quality of online instruction. More specifically, satisfaction within online learning is closely tied to students' expectations and their experiences with the guidance provided by instructors within the online learning system.

The findings of this study reveal several noteworthy insights. The measurement items and factors related to social presence and satisfaction demonstrated satisfactory validity and reliability, as evidenced by the loading factors and Cronbach's alpha values. Therefore, the questionnaire used in this study is recommended for future research, particularly in the context of online higher education. Confirmatory factor analysis was employed as the survey design, yielding acceptable findings that met the established criteria and displayed a good model fit. Furthermore, the results indicated a significant and positive influence of social presence on satisfaction within online learning environments. Consequently, higher levels of social presence experienced by students in online learning environments corresponded to increased levels of satisfaction (Horzum, 2015). Notably, the current study's findings align with previous research, which suggests that social presence can serve as a predictor of student satisfaction in online learning environments, thus constituting a vital component of online learning (Gunawardena & Zittle, 1997; Richardson & Swan, 2003).

In terms of Pearson correlation coefficients, a statistically significant positive correlation was observed among the variables under investigation. The fit indices of the structural equation model (SEM) confirmed the relationship between social presence and satisfaction, indicating that social presence positively contributes to increased satisfaction. The SEM model effectively elucidates the interplay between variables and factors, with each fit index falling within an acceptable range for convergent validity (Hair Jr et al., 2019). Although the goodness-of-fit values were not exceptionally high, they surpassed the minimum threshold value, aligning with recommendations from previous studies. Consequently, this study delves into the process by which nontraditional students (NTS) engage with the online learning system, encompassing both their own satisfaction and that of their instructors within the teaching and learning process.

Notably, distance learning via online platforms emerges as an attractive option for these NTS, who are Indonesian migrant workers pursuing their education through online means. Moreover, these NTS possess distinct needs, including a robust support system to assist them in managing their schedules and balancing their studies with work commitments. It is worth noting that these NTS are typically 24 years old or older, in contrast to traditional students who have the opportunity to reside and study on campus. Furthermore, many NTS face challenges in striking a balance between work and academic performance, making it difficult for them to enjoy a vibrant college experience.

Conclusion

This study delved into the pivotal roles of social presence and satisfaction in the context of online learning, particularly in light of the COVID-19 pandemic. Consequently, discussions surrounding the functions of social presence and satisfaction in online learning have gained greater urgency. The study comprehensively examined and analyzed students' experiences pertaining to social presence and satisfaction within the online learning environment. Methodologically, the application of confirmatory factor analysis provided support for the validity of the place attachment scale as a second-order factor. Therefore, this study can serve as a valuable reference to expand the conceptualization and theory of social presence and satisfaction in online learning. Additionally, the findings lay a solid theoretical foundation for further exploration of the relationships and interconnectedness among these factors. The results of this study also hold important implications for higher education institutions, instructional designers, instructors, and learners. Consequently, the findings can serve as constructive references to broaden the conceptualization and theory of social presence and satisfaction in online learning. Furthermore, they provide valuable theoretical groundwork for further discussions on the relationships and interrelationships among these factors.

However, it is important to acknowledge the limitations of this study. Specifically, the study focused solely on social presence and satisfaction in online learning environments during and after the COVID-19 outbreak. Therefore, future research should consider incorporating additional variables to enrich the understanding of online learning environments. Secondly, the study utilized a relatively small-scale sample of undergraduate students from Indonesia. Future studies should aim to recruit larger and more diverse samples to obtain more robust and conclusive findings. Finally, it is worth noting that the percentage of male and female students in this study was not well-balanced. Therefore, future research should give consideration to gender differences and employ a gender-balanced sample, which would contribute to more robust conclusions.

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Appendix. Questionnaire Statement

Constructs and scale items	Source
SR	
SR1: I enjoy sharing personal stories with my online peers.	Kim (2011)
SR2: When anyone challenges my ideas in online classes, I can respond to them confidently.	Self-developed
SR3: I feel a sense of presence when instructors and other online peers call my name during online discussions.	Sung and Mayer (2012)
SR4: I can call out my online peers' names clearly in online classes.	Self-developed
SR5: I feel a sense of presence when I know my instructors' and my online peers' cultures.	
SR6: I appreciate the use of humour by my instructors and online peers in online learning.	Lin (2004)
SS	
SS1: I feel a sense of presence when I can express my opinions in online learning.	Sung and Mayer (2012)
SS2: I feel a sense of presence when my instructors can express their opinions in online learning.	Self-developed
SS3: Whenever I have any questions, I am willing to ask them in online learning.	Self-developed
SS4: I feel comfortable expressing my feelings in online learning.	Lin (2004)
SS5: I have a good impression of my instructors and online peers in online learning.	Self-developed
OC	
OC1: I feel a sense of presence when my ideas are appreciated by my instructors and peers in online learning.	Sung and Mayer (2012)
OC2: I feel a sense of presence when my questions are quickly responded to in online learning.	Sung and Mayer (2012)
OC3: I feel a sense of presence when I have conversations with my instructors and online peers in online learning.	Sung and Mayer (2012)
OC4: I appreciate the ideas and opinions of my instructors and online peers.	Self-developed
OC5: I feel comfortable when my instructors and online peers express their feelings in online learning.	Self-developed
SN	
SN1: I am inspired to do further work by my instructors' and online peers' actions.	Lin (2004)
SN2: I feel motivated when my instructors and online peers push me to study	Self-developed

harder in online learning.	
SN3: The quality of my work in online learning is influenced by that of other online peers.	Lin (2004)
SN4: I am motivated to work harder if my online instructors and online peers encourage me.	Self-developed
LI	
LI1: The online learning system is user friendly.	Wang (2003)
LI2: The content provided by the online learning system is easily understandable.	Wang (2003)
LI3: The online learning system is stable and reliable.	Wang (2003)
LI4: Taking courses through the online learning system is easy for me.	Self-developed
LI5: I can acquire knowledge from online learning.	Paechter et al. (2010)
LI6: I can develop communication skills through online learning.	Paechter et al. (2010)
II	
II1: I can easily establish contact with my instructors.	Paechter et al. (2010)
II2: My instructors can give me guidance in online learning courses.	Self-developed
II3: My instructors can give me instant feedback in online learning.	Paechter et al. (2010)
II4: My instructors constantly help me with my learning in a friendly way.	Self-developed
PI	
PI1: The online learning system enables me to monitor my learning progress.	Wang (2003)
PI2: The online learning system can record my learning progress.	Wang (2003)
PI3: I can acquire self-management skills from online learning.	Paechter et al. (2010)
PI4: I can apply the knowledge and skills that I have learned through online learning to solve problems in my daily life.	Paechter et al. (2010)
CC	
CC1: The online learning courses that I take are informative.	Self-developed
CC2: I am encouraged to do extensive reading on the topics discussed in online learning.	So and Brush (2008)
CC3: The content and structure of the online courses are well planned.	Self-developed
CC4: The courses I take meet my needs.	Sun et al. (2008); So and Brush (2008)
CC5: The online learning system enables me to acquire the knowledge I need.	Paechter et al. (2010)