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Crucial Role of Teaching Interaction, Social Presence, and Self-Regulation in Enhancing the Online Learning Experience

Mei Zhang[1] & Xuan Zhou[2]*

1. PhD, General Graduate School, Dongshin University, Naju 58245, South Jeolla, South Korea.
1. School of Art and Design, Guangzhou College of Commerce, Guangzhou 510260, China.
Email: funzz11@cqu-edu.cn
2. PhD, School of Creative Arts and Culture, Namseoul University, Cheonan 31020, Chungcheongnam-do, South Korea. *Corresponding Author Email: zhouxuan123123123@163.com

Abstract

Learning now gets to be done at the convenience of the student and with greater mobility. In this respect, however, replicating the rich learning environment of face-to-face instructions in an online environment bears unique challenges. It is in this regard that this research puts forward the importance of online learning through effective communication, social interaction, and self-regulation. We contend that teaching conversation—a nature and regularity of contact between students and instructors—raises a feeling of community and helps in social and cognitive growth. We base our claim on constructivist social and independence theories. Motivation, involvement, and an overwhelming sense of belonging are improved by social presence, the measure of how people sense linked to others in an online setting. Learning online comes with motivation, a sense of involvement, and a general feeling of belonging. This study will explore how online learning has been influenced by each of these three elements, along with their interrelationships, and predicts that student motivation, satisfaction, and academic success will be increased when social presence, self-regulation, and instructional engagement are all high. Such implications are indeed very important with regard to the design and implementation of online education programs. The importance of these characteristics will, therefore, help teachers design more successful and captivating online learning experiences that bring out student achievement and foster a good learning environment.

Keywords: *Online Learning; Social Presence; Self-regulation; Teaching Interaction; Independence Theories.*

1. INTRODUCTION

Modern life has made extensive use of communication and internet technologies. One of the most important and useful uses of technology nowadays is online learning. Online learning is becoming more self-regulated as a result of the popularity of several video-focused asynchronous courses [1]. Students can now complete their coursework more conveniently and with mobility. The research emphasizes the value of learning via the Internet through social engagement, effective communication, and self-control in this situation [2]. The existence of the teacher is crucial and directly impacts how well students perceive their learning. Even though online courses have benefits for students and organizations, such as affordability and ease of savings [3]. Research on the continuing intention of university students to learn online has been done on the perspectives on ideas or actions, experiences with learning online, learning motivation, and competence [4].

They argue that encouraging pupils and educators to have continuous and conversational interactions fosters a sense of community and supports cognitive as well as social growth. Our

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argument is based on ideas of constructivist social and individuality [5]. Educational institutions quickly switched from on-campus to virtual education because of COVID-19 pandemic, which significantly disrupted and altered the global educational system [6]. Students who feel there are fewer social connections in the classroom also report having more trouble learning and controlling their behavior when studying online. Additionally, students' views of the pandemic's disturbance of their lives and their ability to adjust to learning online are impacted by their perceived absence of social contacts in the classroom [7].

Online communities and internet use have grown to be significant aspects of daily life, mostly due to technical advancements. The biggest impact on teenagers' ways of speaking may be demonstrated by this part of the equation [8]. They tended to oppose as well as refuse online learning for several factors, including the inadequacies of the medium, the insufficient self-control of youngsters, and their absence of experience and expertise in assisting kids with their online education [9]. Students can exchange thoughts about a variety of subjects with one another through interactive online education [10]. In addition to encouraging deeper comprehension, student-led online conversations often result in intriguing individual uses of the material and theories [11]. Social presence refers to how connected people feel to one another in an online environment. It increases inspiration, participation, and an overwhelming feeling of belonging [12]. Enthusiasm, a feel of engagement, and a general feel of community are accompanying online learning. It will explore how these three factors have influenced online learning and how they interact with each other [13].

It predicts high levels of social presence, self-regulation, and instructional engagement will boost motivation among the learners, satisfaction, and academic achievement. These implications for the scheduling and execution of online education activities are, in fact, crucial [14]. Therefore, these qualities help educators create more effective and engaging virtual learning environments that help enhance student performance and maintain a positive learning atmosphere [15].

Study Motive

The motive of the present study is to analyze: 1) whether teaching interaction (TI) has an impact on social presence (SP) and learning ability (LA) in online education systems. 2) Whether self-regulation (SR) has an impact on the learning ability and social presence in online education systems. 3) Whether social presence intercedes the connection of self-regulation with learning ability and the connection of teaching interaction with learning ability in online education systems.

2. LITERATURE REVIEW

Stephen, et al (2021) [16] looked at whether students enrolled in an innovative significant influence the FSS (First-Semester Seminar) course compared to a standard FSS class had different self-efficacy heights in online learning, self-direction, and self-regulation. A pretest-post-test, quantitative, quasi-experimental research strategy with uncomparable control clusters was employed and the data were analyzed using multivariate analysis of covariance (MANCOVA) and supplement covariance (ANCOVA) analyses.

Steinfeld, (2021) [17] examined parental internet access mediation techniques for teenagers and how they relate to teenage age, worries about online safety, engaging in risky conduct, and online activities. Regarding the usefulness or superiority of any one mediation

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technique, prior studies on parental mediation are equivocal. Measures were taken of different mediation by parents' styles as well as psychological, emotional, conceptual, and persistent elements of teenage access to the internet. Parents using a range of forms and situations that utilize mediation techniques were found.

Vanslambrouck, et al (2019) [18] suggested the multiplicity of students in integrated education programs for adults leads to variance in SRL capacities, necessitating customized support. The disparities in SRL among the identities and the degree to which each student's aspirations for success were examined and the ways to assist and improve SRL skills in schooling were provided like effective time management, achievement and utility value anticipation, and alliance with aristocrats. More precisely, teachers should serve as instructors for internet interaction and data exchange or incorporate practical duties and situations into their lessons.

Kara, et al (2021) [19] examined learner outcomes, including fulfillment as well as perceived learning, and online young professionals' self-regulation of instructors in three different forms of communication via the Internet. An online teacher training program including 372 pre-service teachers followed by the path analysis and statistical methods indicated a moderate degree of self-regulation perception among online pre-service instructors in three different forms of online engagement and learner outcomes.

Rasheed, et al (2021) [20] suggested a method for assisting students utilizing the internet blended educational as a part of their collaborative learning self-monitoring technique. Encouraging and facilitating peer learning in small groups entailed creating online collaborative learning communities depending on the educational value and attraction frameworks; utilizing the characteristics of the educational platform to trigger group dynamic components, and encouraging pro-social actions by providing rewards to address the innate issues of students' unwillingness to take part in collaborative learning. An effective peer-learning self-regulation online method structure is involved to avoid social isolation and participation rejection.

Blume, et al (2021) [21] examined how trait self-regulation as well as perceived difficulty with tasks relate to students' daily self-regulation when they are home-schooled during the SARS-CoV-2 epidemic. By being independent from their family members and not having any difficulties while working on the learning activities, students' everyday self-management during studying was evaluated. The impact of task enjoyment and difficulty in learning freedom was also checked.

Eberle, et al (2021) [22] proposed a way for first-year students to participate in emergency online instruction during COVID-19 and sought to comprehend personal experiences while satisfying fundamental psychological needs based on the C-flat model. Implementing this technique demonstrated the good advantages of ending the travel between home and university, but also the negative consequences of inadequate internet access and the confluence of education and home environments. Crucial components including students' ability to control their behavior, establishing and sustaining social relationships, and providing motivational support during interactive educational tasks were also done.

Rapanta, et al (2020) [23] aimed to assist non-professional university lecturers in navigating these difficult circumstances, they offer a few experienced insights into this PCK connected to online learning. Our outcomes suggest that specific features should be included in the development of learning activities, that three forms of presence social, cognitive, and

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facilitatory should be combined, and that evaluation should be modified to meet the demands of the new learning objectives. They conclude with some thoughts about how, in the post-digital world, improved educational and instructional practices may arise from a crisis response.

Wertz, (2022) [24] presented the confirmed measures required for the study of second-order causal paths that was carried out in this two-phase project second phase. It yielded two notable findings: firstly, the subscale for peer facilitation was added, which was later moved from the build of the presence of a teacher to societal existence. This shift highlights the discrepancy among the hypothetical underpinnings of the COI framework and the observed relationships in the created education setting. Secondly, the sturdiest correlation between the COI constructs was found between perceived learning (LP) and cognitive presence (CP), additionally supporting the inclusion of LP as an independent concept within the COI framework.

Wu, et al (2023) [25] investigated the relationship between the three forms of contact and happiness in students in both high school and college in a virtual classroom. They used a structural equation model (SEM) to look at the connection among academic feelings and learning that is self-regulated. The findings showed that distinct processes operated in the various groups. In the context of learning ability, it offers fresh perspectives on the connection between engagement and enjoyment and offers empirical evidence in favor of its mechanism.

Hypothesis:

Hypothesis 1: Social presence holds a constructive influence on learning ability in online education methodology.

Hypothesis 2: Teaching interaction holds a constructive influence on learning ability in online education methodology.

Hypothesis 2a: Teaching interaction holds a constructive impact on social presence.

Hypothesis 2b: The Social presence intercedes the connection among teaching interaction and learning ability

Hypothesis 3: Self-regulation connects constructively with learning ability in online education methodology.

Hypothesis 3a: Self-regulation has a positive impact on social presence.

Hypothesis 3b: The Social presence intercedes the connection among self-regulation and learning ability.

3. METHODOLOGY

3.1 Participants

The sample for the present research involved 328 regular postgraduate students (157 men, 171 women, response rate = 85.6%) from a great South Korean university. The students who were present on the day of the survey were considered eligible and were enrolled in diverse disciplines of 2-year post-graduate courses, but the majority of participants were second-year (59.7%). Everyone has already undergone an online education prior to this study. Based on the discipline of their study, 43.7% were in the Natural Science stream, 34.6% were doing their engineering, 11.5% were studying humanities, 6.4% were in the Fine Arts stream, and 3.8%

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from the Medicine stream. Normal pen and paper questionnaires were distributed and Data were collected after getting written informed accord to partake in this survey. The present research's ethical consent was attained from the Dongshin University Ethics Committee.

3.2 Procedures

The online learning engagement scale (OLE) used by Sun and Rueda (2012) [26] was adopted and modified for the present work with the scale having three proportions namely behavioral engagement (four objects), cognitive engagement (six objects), and emotional engagement (six objects). The modified OLE used a Likert scale ranging from 1 to 5, where 5 indicates strongly agreed and 1 indicates strongly disagreed.

Eunmo and Richard's (2012) [27] Online Social Presence Questionnaire (OSPQ) was used to measure social presence. OSPQ has 5 proportions like social identity (four objects), social respect (five objects), intimacy (two items), open mind (three objects), and social sharing (five objects).

Self-regulation was determined by Barnard et al. (2009) [28] Online Self-Regulated Learning Questionnaire (OSLQ) that has 6 proportions containing environment structuring (four objects), goal set (five objects), help seeking (four objects), self-evaluation (three objects), task tactics (four objects), and time managing (three objects).

Teaching interaction was estimated using a scale having eighteen objects prepared from the earlier study on student interaction in online education [29]. These eighteen objects were clustered under three proportions via learner-content interactions (four objects), student-student interactions (eight objects), and student-teacher interactions (six objects).

3.3 Control Variables

Based on the earlier studies on learning ability in the online education system, Gender, and discipline were used as the control variables.

4. RESULTS AND DISCUSSIONS

4.1 Descriptive Statistics

The data on participants is given in Figure 1 and the descriptive analytics for the survey data for all variables utilized in the current research are given in Table 1. The Cronbach's α coefficient for LA, SP, SR, and TI were correspondingly 0.867, 0.874, 0.883, and 0.879. The learning ability in online education was positively associated with self-regulation ($r = 0.724$, $p < 0.01$), social presence ($r = 0.714$, $p < 0.01$); and teaching interaction ($r = 0.614$, $p < 0.01$). Furthermore, social presence was constructively associated with self-regulation ($r = 0.683$, $p < 0.01$) and teaching interaction ($r = 0.641$, $p < 0.01$), while self-regulation was constructively associated with teaching interaction ($r = 0.734$, $p < 0.01$).

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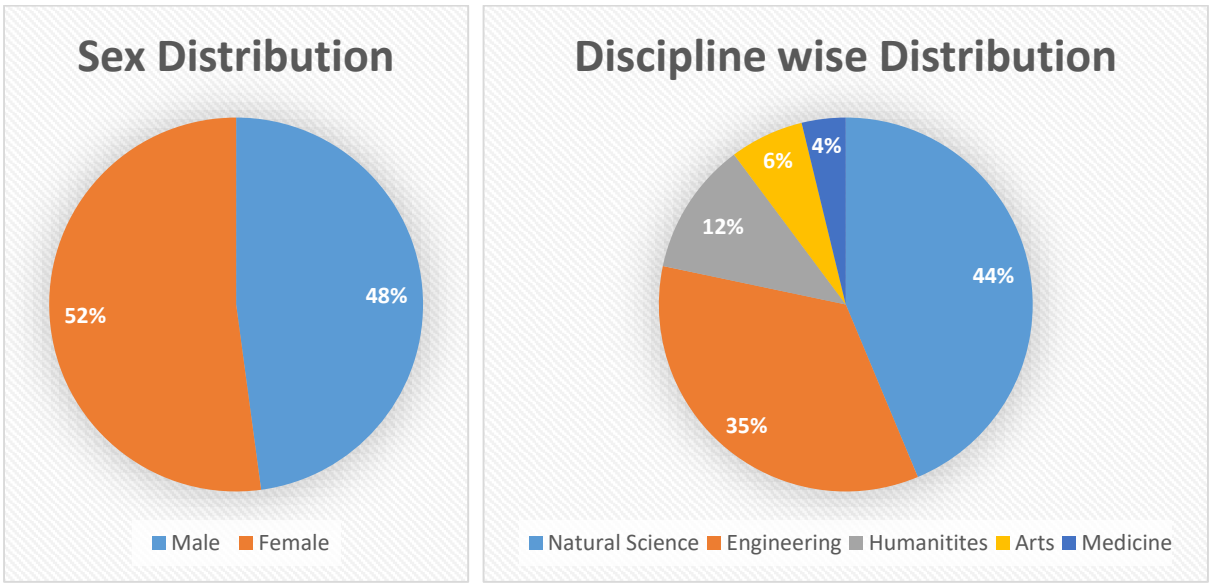

Figure 1: Distribution of Participants

Table 1: Descriptive Statistics, Correlation, and Reliabilities

Variables	Mean	SD	Correlations		Reliability					α Coeff
Learning ability	3.372	0.697	-0.074	0.142	0.224	0.895	**	**	**	0.867
Social Presence	3.306	0.783	-0.038	0.053	0.181	0.714	0.921	**	**	0.874
Self-regulation	3.423	0.611	-0.098	0.189	0.201	0.724	0.683	0.932	**	0.883
Teaching Interaction	3.574	0.599	-0.057	0.148	0.131	0.614	0.641	0.734	0.902	0.879

The part of social presence in building a trusty environment by assessing the social presence and its relationships with apparent learning making social presence as more socio-emotional based without affecting intellectual sources was already confirmed [31]. The crucial role of social presence in making students more satisfied was determined by identifying the emotive and societal involvement of students in learning [32].

On the other hand, learning ability was not affected directly by teaching interaction as the designed interaction was a highly cooperative one. When online learners focus on interaction alone and overlook emotional expression and open communication with the instructors, obtaining cognitive, emotional, and learning behavior engagement is tough [32]. However teaching interaction has an indirect impact on learning ability through social presence [33, 34].

4.2 Confirmatory factor analysis

The discriminant effectiveness of the core factors namely LA, SP, SR, and TI in this study were examined by confirmatory factor analysis (CFA). Bearing in mind the comparatively small sample size, packages of the measured variables were created beforehand doing CFA based on Landis et al. (2000) [35] suggested content-based parceling method. Each measurement was packed using this content-based method into one item when a greater quantity of data was available within a scale. Therefore, LA was grouped into 3 objects, SP was grouped into 5 objects, TI was grouped into 3 objects and SR was grouped into 6 objects. The CFA outcomes given in Table 2 indicated that the hypothesized four-factor model was better than other alternate models as it met those recommended conditions. They also indicated the good discriminant validity was found in the present study between these four important variables.

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Table 2: ***Measured model comparison***

Models	χ2	df	RMSEA	CFI	NFI	TLI	IFI
4 factor model TI, SP, SR, LA	376.478	118	0.77	0.918	0.899	0.909	0.919
3 factor model I (TI+SP), SR, LA	539.146	114	0.111	0.867	0.851	0.857	0.867
3 factor model II (SP+SR), TI, LA	643.256	114	0.116	0.854	0.835	0.842	0.854
2 factor model (LA+SR), (TI+SP)	578.921	119	0.121	0.861	0.842	0.853	0.862
1 factor model (TI+SP+SR+LA)	729.851	121	0.133	0.835	0.815	0.824	0.835

Similar kinds of results were obtained earlier [33] and even a different perspective on learning ability was provided [36] as teaching interaction increased the societal communication and data sharing among students like arguments, intellectual description, societal knowledge gaining, and conciliation in online learning. The present inverstigation revealed the impact of Social presence along with teaching interaction on learning ability and insisted on the need for an emotional, motivative, and interactive learning method in online education situations throughout the revolution of learning insights into learning outcomes.

The connection among social presence, learning ability, and self-regulation, in online education was thoroughly analyzed based on different theories of social presence and self-regulation. Previous work of Christopherson (2011) [37] categorized teaching interaction and social presence as outside factors whereas self-regulation as an internal factor affecting online learning ability.

4.3 Testing the Hypothesized Model

The hypotheses assumed were verified using Structural Equation Modeling (SEM) and the data was canalyzed ompletely through the SPSS (IBM, USA) software package. The outcomes given in Figure 2 depicted that all the path coefficients provided were substantial ($p<0.01$), excluding the path coefficient among teaching interaction and learning ability. The goodness-of-fit indices for the four-factor model showed that it fits well for the data used. The findings revealed that social presence pointedly projected learning ability ($\beta = 0.43$, $p < 0.001$), whereas, teaching interaction ($\beta = 0.45$, $p < 0.001$), and self-regulation ($\beta = 0.38$, $p < 0.01$) pointedly projected social presence. Subsequently, hypothesis 1, hypothesis 2a, and hypothesis 3a were maintained. Self-regulation ($\beta = 0.48$, $p < 0.001$) too pointedly foretold learning ability indicating the acceptability of hypothesis 3, whereas the path coefficient among learning ability and teaching interaction ($\beta = 0.08$) was unsubstantial indicating the failure of hypothesis 2.

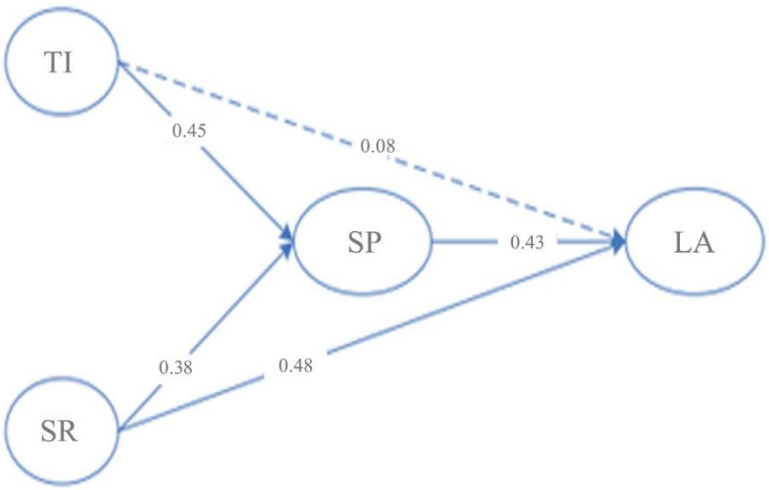

Figure 2: Structural Equation Modeling

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The consequence of self-regulation on social presence was identified in the present modeling and is in line with certain quasi-experimental research results indicating structural and intentional teaching practice is mandatory for improving self-regulation. An online pedagogical intervention was even incorporated for self-regulation training in online settings to enhance the learning ability of the students [38].

The consequence of the above-mentioned intercession was tested by employing an appraised bias-corrected 95% bootstrap confidence interval as per the previous research [39] and the results were given in Table 3. They revealed that there is an indirect consequence of teaching interaction-learning ability connotation and self-regulation-learning ability connotations. The exclusion of zero in the two 95% confidence intervals revealed the momentous interceding part of social presence in these two connotations thereby validating hypotheses 2b and 3b. As a whole, the results pointed out the impact of social presence in partly arbitrating the link amid teaching interaction and learning ability and fully facilitating the link among learning ability and self-regulation.

Table 3: Path coefficients

Path	Indirect Effect	SC	95% CI		P
			Lower	Upper	
TI-SP-LA	0.182	0.096	0.043	0.421	<0.01
SR-SP-LA	0.139	0.081	0.016	0.321	<0.01

The present research evaluated the influence of self-regulation on learning ability and social presence and the findings were similar to that of previous research in which self-regulation activities like self-control, self-reaction, self-motivational principles, self-observation, and task analysis nurtured uncluttered communiqué and cluster solidity of social presence and enhanced learning ability in online education systems [40, 41]. When social presence and self-regulation needs were met, participants got motivated and were continuously engaged in online learning.

At the outset, the momentous impression of teaching interaction, social presence, and self-regulation in the learning ability of students in online education were portrayed in the present study. Surprisingly, there is no direct influence of teaching interaction on the learning ability of students, but there is an indirect impact through social presence. Therefore, the integration of teaching interactions, self-regulation, and social presence was the need of the moment to augment the learning ability of the students in online education. These results deliver clear speculative real-world insights that aid teachers and course providers in designing effective online courses for higher education.

5. CONCLUSION

This research focused on exploring the influences of teaching interaction, social presence, and self-regulation on the learning ability of higher education students of South Korea through online mode. The research findings deep-rooted the direct impact of social presence and self-regulation on learning ability along with the interceding effect of social presence in the impact of teaching interaction and social regulation on learning ability. These results provide a momentous real-world inference for the South Korean Higher education system. Based on these findings, social presence has a crucial impact in learning ability, and the course providers have to consider the students' aloneness, dullness, negative emotions and disconnected feeling and desing the course with interactive activites to enhance the learning

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ability. Further research is needed as the entire research was based on data from questionnaire alone and not other modes of data collection and the focus was only on learning ability and not outcome. With outcome based study programs are evolvoing globally, the research has to be further extended focusing on the outocome of the online education with diverse data collection strategies for further validated research outcomes.

Declarations

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: No funding was received for conducting this study.

Ethical approval: This study does not contain any studies with human or animal subjects performed by any of the authors.

Data Availability: All the data is collected from the simulation reports of the software and tools used by the authors. Authors are working on implementing the same using real world data with appropriate permissions.

Declaration of competing interest: The authors have no competing interests to declare that are relevant to the content of this article.

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