



The Satisfaction of the Special Need' Students with E-Learning Experience During COVID-19 Pandemic: A Case of Educational Institutions in Indonesia

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Abstract

COVID-19 had a disastrous impact on the education sector resulting in a boom of online learning systems. This shift has severely impacted the underprivileged students with special needs due to the sudden implementation of prolonged distance learning. Thus, it creates an immense need to analyze distance learning media's effectiveness during the COVID-19 pandemic for students with special needs. The E-learning readiness and satisfaction of special needs students are scarcely investigated areas in education and e-learning literature. Established on the community of inquiry (COI) model, this study aims to determine the factors that underpin students' satisfaction with their e-learning experience through the mediated mechanism of students online learning readiness. Surveying 178 special needs students from various Indonesian universities revealed that teaching presence, cognitive and social presence, and content quality, directly and indirectly, influence e-learning satisfaction. This extended and more comprehensive model would help educators better understand e-learning's use as an effective pedagogical platform, especially in the context of special needs students. Key policy implications and directions for future research are suggested.

Keywords: community of inquiry model, content quality, online learning readiness, students' cognitive presence, social presence, students' satisfaction with e-learning experience, teaching presence

INTRODUCTION

The year 2020 has been an unpredictable year due to the COVID-19 pandemic. This deadly pandemic affected businesses, jobs, and people's way of life across the globe (Ramos-Morcillo et al., 2020). Governments are striving to cope with the adverse effects on the economy and people's a day-to-day chore (Shehzadi et al., 2020; UN, 2020). Besides health, the education sector is the most affected sector, as schools, colleges, and universities had to shift to an online learning system (Caskurlu et al., 2020; Fong et al., 2020). Therefore, online learning turned out to be an effective way of continuing the overall learning process between teachers and students (Warden et al., 2020).

There has been plenty of research on the effectiveness of the online education system and how students perceive it (Akyol & Garrison, 2008). Still, little to less is known about special need students' satisfaction with an online learning experience (Joosten & Cusatis 2020). Therefore, current study is an attempt to bridge this gap by investigating the factors leading to the satisfaction of the special need's students with e-learning

experience during the COVID-19 pandemic. Special needs students are those students who have any disability that impairs their ability to participate in a typical classroom environment (Samaila et al., 2020). For such students' various techniques and processes have been introduced to promote a healthy and effective learning environment.

One such thing is computer-aided technology, as it turned out to be supportive in aiding the students in understanding and learning the curriculum (Lee et al., 2020). In an online system, a teacher's role is to motivate, encourage, and guide students to achieve study-related objectives (Garrison et al., 2010; Luczak & Kalbag, 2018). Therefore, a teacher needs to have sound knowledge of the technological equipment, its usage, and its implications. To facilitate a positive learning environment, a teacher needs to ensure ongoing communication between learners and the teacher (Baharuddin & Dalle, 2019; Lim & Richardson, 2016; Yamamori, 2019). Therefore, teaching presence is highly important in the overall satisfaction of the learner, his/ her perceived learning, and sense of community.

Another important factor in determining student satisfaction is the student's cognitive presence, which is the student's ability to construct and derive meaning through sustained reflection and discourse (Nagel & Kotzé, 2010; Sadeghi et al., 2018). For special needs students, the cognitive process differs from those of other students; therefore, they need individual attention and tools to be able to process, solve and integrate ideas they explored during the learning process (Beckmann & Weber, 2016). The cognitive presence requires a higher level of attention and thought process by the learner to critically look at things and explore them (Algahtani, 2011). Therefore, in this study, we will explore how special needs students exhibit cognitive presence through e-learning. How their cognitive presence impacts their online learning readiness and satisfaction level with the e-learning experience?. The social presence of the students is another important factor described as the ability of learners to project themselves socially and emotionally in a virtual environment (Joo et al., 2011). This factor has long been studied in the literature for both online and face-to-face interaction, but research on its relationship with the online learning readiness of the special needs students and their satisfaction level with e-learning experience is scarce.

Moreover, e-learning supports flexibility in terms of time, space, and location, which has introduced innovation and creativity in teaching methods (Caskurlu et al., 2020). The content developed online for e-learning can use various tools and methods like images, videos, audio, voice calls, instant messaging and emojis, etc., to create meaningful engagement between learners and instructors (Samaila et al., 2020). Learners can express opinions without hesitation and awkwardness associated with face-to-face interactions (Richard et al., 2020), reflecting that the content quality for e-learning greatly impacts the overall student's satisfaction, especially in the current pandemic, where institutes must rely highly on e-learning to cover study material. Moreover, in view of the sudden pandemic situation, it raised questions about the institutes' e-learning readiness in general and for students with special needs in focus. Therefore, this study also advanced by exploring online readiness for effective online interaction between the student and teacher, specifically for students with special needs. Online readiness is defined as an individual's ability to utilize e-learning resources and multimedia technologies to improve learning quality (Akyol & Garrison, 2008). In other words, online readiness involves having the physical and cognitive skills necessary to engage in an e-learning experience.

This study used the community of inquiry framework (COI model). COI assumes that teachers and students form a community. Thus, a satisfactory e-learning experience stems, which further engages them in critical thinking. Furthermore, it is stipulated that three presences emerge from effective engagements between students and teachers in an online environment, i.e., teaching, social, and cognitive. However, in the e-learning context, research into the community of inquiry framework is mostly theoretical rather than empirical (Bangert, 2008; Breivik, 2016). In addition to this limitation, the studies related to the community of inquiry framework that simultaneously takes into account the influence of all three factors' presence are scarce in the literature (Kozan & Caskurlu, 2018; Law et al., 2019; Sawatsuk, 2018). To address these research gaps, this study developed a conceptual model to illustrate the influence of three presences, along with an environmental factor (content quality), on student's satisfaction with e-learning experiences through a mediated mechanism of online learning readiness. This study adds to the literature in terms of contributing

to special needs students' education and their satisfaction with the e-learning experience. Thus, drawing on the community of inquiry (COI) model, this study attempts to determine the factors underpinning students' satisfaction with their e-learning experience. Moreover, the current study will answer the following questions.

1. Do teaching presence, students' cognitive and social presence, and content quality are positively associated with the special needs students' online learning readiness and their satisfaction with e-learning experience?
2. Does special need students' online learning readiness is positively associated with their satisfaction with the e-learning experience?
3. Does special needs students' online learning readiness mediate between the presences (teaching presence, students' cognitive and social presence, and content quality) and satisfaction with the e-learning experience?

LITERATURE REVIEW

Community of Inquiry (COI) Framework

The current study was established on the community of inquiry (COI) framework to investigate special needs students' satisfaction with the e-learning experience. COI explains the process of creating a deep and meaningful (collaborative-constructive) learning experience. It assumes that various actors of a particular scenario form a community; thus, a satisfactory e-learning experience makes them think critically. Furthermore, to create virtual environments like classroom-setting for effective engagement and interaction with students, many instructors shift to group-based learning through mediums like google, Zoom, and Microsoft Teams (Law et al., 2019). From these group-like communities, the concept of a community of inquiry framework has arisen. Besides, the community of inquiry (COI) framework was first developed to guide educators in using computer-mediated communications for learning purposes (Garrison et al., 2000; Wasike, 2017). Moreover, the community of inquiry framework suggests that an educational presence is created through teaching presence, social presence, and cognitive presence by incorporating meaningful collaborative activities between the teacher and student. Further, it illustrates that a group of individuals collaboratively construct knowledge for designing learning-based outcomes (Shehzadi et al., 2020). In the case of this study, these positive outcomes are special needs students' satisfaction level with their e-learning experience. The application of the COI framework in special needs students setting is another major advance made by this research.

Teaching Presence, Students' Cognitive Presence, Students' Social presence, Content Quality and Students' Satisfaction with the E-learning Experience

Teaching presence in this matter has been described as designing, facilitating, empowering, and leading the social and cognitive presence of the students to derive learning outcomes (Akyol & Garrison, 2008). In any online learning system, teaching presence is critical for the student's overall satisfaction as it depends upon the way a teacher designs coursework, its methodology, its delivery, and instruction (Law et al., 2019). Since physical availability is lacking in an online setting, hence a sound design developed by the teacher with clear instruction aids in creating a teaching presence (Richard et al., 2020). Literature reveals the impact of various factors that enhance the students' satisfaction level with the e-learning experience. However, the impact of teaching presence to enhance students' satisfaction level with e-learning experience, especially during the crises of COVID-19, has been rarely explored by the researchers. Additionally, in the case of a special need's student, it is important for a teacher to design courses and instructions that can improve understanding and ensure maximum engagement to make students more satisfied with the teaching efforts. Thus, established on the COI framework, the current study tried to bridge this gap in the literature and suggested that;

H1a: *Teaching presence is positively associated with the students' satisfaction with the e-learning experience.*

The term cognitive presence means designing a course that requires critical thinking and analysis by the students and involves them to come together for problem-solving (Garrison & Akyol, 2015; Law et al., 2019). Garrison et al. (2000) operationalize cognitive presence as a four-stage process leading to successful e-learning outcomes starting from the ways students understand the problem, leading to their discussion about the problem with others, further leading to construction of information and meaning from that discussion, and ends with the solution of the problem through consensus building. In higher education, the importance of critical thinking is considered significant in building students' intellect (Kozan & Caskurlu, 2014); therefore, for this purpose, the interaction must be more structured and systematic (Beckmann & Weber, 2016; Giannousi & Kioumourtzoglou, 2016). Studies show that activity-based learning that involves problem-solving and intuitive thinking leads to higher satisfaction levels in students (Garrison & Cleveland-Innes, 2005; McKerlich et al., 2011). Moreover, especially in the context of special needs students and e-learning experience, it is found that many of them are physically or mentally impaired to perform cognitive presence (Samaila et al., 2020). Therefore, it lies in the design of the study to introduce ways that aid in developing these abilities in the students to make them more satisfied with their online learning experience (Garrison et al., 2010; Nedal & Alcoriza, 2018). Thus, based on the above literature and COI framework, which advocates the importance of cognitive abilities of an individual to get engaged and happy with a particular learning experience, it is asserted that;

H1b: *Student's cognitive presence is positively associated to students' satisfaction with the e-learning experience.*

Students' social presence is "a sense of being in and belonging in a course and the ability to interact with other students and instructors although physical contact is not available" (Picciano, 2002, p. 20). Students consult each other to discuss projects and assignments, especially in a group assignment; they need to collaborate and participate actively (Bangert, 2008). Nonetheless, peer to peer online interaction builds up a social presence (Tung & Deng, 2006). Studies show that social presence affects online course enrollment, engagement, participation, and the students' satisfaction level (Lowenthal, 2010). Particularly for special needs, student studies found that emotional supports increase the level of satisfaction (Gunawardena & Zittle, 1997). Likewise, Rasmitadila et al. (2020), depicted the importance of instructional based strategies for enhancing special need students, satisfaction with their e-learning experience. Whereas the current study is unique in checking the impact of special need students' social presence to get satisfied with the online learning experience. Therefore, based on the above arguments and COI framework, which reflects the importance of social factors in an individual's learning experience, it can be stated that social presence for special needs students will help boost their confidence and expected to help them perform better for collaborative activities. Thus, it is hypothesized that;

H1c: *Students' social presence is positively associated with students' satisfaction with the e-learning experience.*

Content quality is an important and critical factor for developing overall satisfaction for e-learning based education (Bangert, 2008). It is particularly important that the e-learning systems can integrate different strides of content and navigation to respond to the diverse needs of the learners and avoid cognitive overload (Ehlers & Hilera, 2012). Literature shows that course content determines the perceived quality and perceived interaction between students and teachers (Elzainy et al., 2020). Favale et al. (2020), in their study, reflected that in the e-learning system, the information quality determines the overall satisfaction of students with the system. Further, the institution and an instructor need to ensure that the content is well structured and well presented to ensure quality (Ramos-Morcillo et al., 2020). Exclusively for special needs students, the content matters a lot for developing sound understanding and engagement (Rasmitadila et al., 2020). Therefore, the content design would be of course, customized and unique based on the specific needs of the special needs students to promote a sense of community and collaboration to make the students satisfied (Caskurlu et al., 2020). Hence based on literature review and COI framework, it is proposed that:

H1d: *Content quality is positively associated with students' satisfaction with the e-learning experience.*

Teaching Presence and Students' Cognitive and Social presence, Content Quality and Students' Learning Readiness

Online readiness means the ability to adapt and manage self-directed online learning using tools, skills, and knowledge (Calli et al., 2013). This involves creating and sharing content online through synchronous and asynchronous applications (Shea et al., 2010). Students who enroll in online courses have varying readiness and preparedness levels (Joosten & Cusatis 2020). Rooted in the Community of Inquiry framework, the authors of the current study argued that some important factors trigger the students' online learning readiness positively, including teaching presence and students' cognitive and social presence, as well as content quality. The teacher's set of skills and knowledge is useful for designing the overall instructions, facilitating students to get ready for the online learning experience. A teacher can show his/her presence by taking various styles in an online session like a generative guide, conceptual facilitator, reflective guide, personal muse, and role-play who can motivate a student to participate in online sessions (Bangert, 2008). Effective learning has long been associated in the literature with an instructor's ability to convey necessary information and build understanding effectively (D Randy Garrison et al., 2010). Studies show that methodological choices compliment the complexity of one's learning outcomes; students get ready with the e-learning process. Still, students prefer face-to-face interaction for practical application of concepts (Giannousi & Kioumourtzoglou, 2016). Cognitive presence exists in the virtual environment created by providing the students to construct and derive meaning critically (Redmond, 2014). Therefore, cognitive presence forms the basis for the community of inquiry framework to derive learning-based outcomes (Law et al., 2019). Therefore, to support this process for special needs students online, the institutions and teachers must design an interactive session, provide tools required for problem-solving, and aid the students to feel comfortable with the e-learning process.

An important contribution of online social networks is that they have been able to bring people closer from around the globe, forming a sense of community (Lim & Richardson, 2016). People can share knowledge, information, and ideas with peers, friends, research scholars, and groups that are created specifically for knowledge sharing and information building (Annand, 2011). Although many studies show that cognitive and teaching presence is a vital part of the community inquiry framework, social presence is necessary to create a sense of belonging among participants to accept the change (Shehzadi et al., 2020). Some studies also point out that groups with a strong social presence are more interested in learning via e-learning platforms (McKerlich et al., 2011). Literature shows that social presence promotes users' social motivation, improves the affordability of telecommunication systems, and enhances their willingness to participate in online interactions (Swan & Shih, 2005). In addition, the content developed should be relevant, up-to-date, flexible, interactive, and should be able to evaluate student's performance through examinations and quizzes so that they accept and get ready for the e-learning system (Shea et al., 2010). Studies show that high-quality content includes usability, the meaningfulness of content, and the adequacy of information (AlMulhem, 2020). For special need students, it is very critical to keep into consideration the quality of the content so that they feel comfortable to learn via the online platform as it is evident from the literature that students perceive a teacher's performance based on content quality in online interaction (Udo et al., 2011). Thus, based on the above discussion and COI framework following hypotheses are suggested:

H2a: *Teaching presence is positively associated with the students' online learning readiness.*

H2b: *Students' cognitive presence is positively associated with their online learning readiness.*

H2c: *Students' social presence is positively associated with their online learning readiness.*

H2d: *Content quality is positively associated with students' online learning readiness.*

Students' Online Learning Readiness and Satisfaction with E-learning Experience

There are various systems, software, and tools required to carry out e-learning (Calli et al., 2013). Therefore, higher-order learning is necessary to possess the intrinsic motivation and personal qualities to derive the meaning of online-based learning (Alnagar, 2020). The exact requirement varies with the contents of the design of the course. The know-how of operating telecommunication devices and using them to promote

learning, critical thinking, and research is known as online readiness (Calli et al., 2013). Moreover, online readiness includes technical skills, computer efficacy, attitude towards learning, and a sense of competitiveness (Ehlers & Hilera, 2012). Research suggests that students vary at their levels to interact and interpret information in an online learning environment (Azlan et al., 2020). In addition, Cooper et al. (2016), showed that greater online readiness leads to improved performance and learning, resulting in building overall satisfaction. Literature shows a direct and positive association between online learning readiness with students' enhanced performance (Wei & Chou, 2020) and satisfaction with the system (Kumar, 2021). Whereas, established on the COI framework current study is incremental in the body of research while examining the effect of online learning readiness on special need students' satisfaction with their e-learning experience during the tough times of COVID-19. Thus, it is hypothesized that;

H3: *Online readiness is positively associated to students' satisfaction with the e-learning experience.*

Mediating Mechanism of Online Readiness

The learning process in an online setting involves investigation, analysis, interpretation, and implementation of the information derived through online engagement. Goh et al. (2017) depicted that one hindrance leading towards dissatisfaction with online learning is the inability of the student to understand the content. Hence online readiness can help resolve that issue through building know-how and self-efficacy to promote understanding and learning. Literature shows that satisfaction is interrelated with interactive learning environments (Garrison & Cleveland-Innes, 2005). In terms of the current pandemic, where most universities are forced to switch towards online learning, students must possess online readiness for effective e-based learning (Fegert & Schulze, 2020).

Moreover, Ramos-Morcillo et al. (2020) argued that online readiness plays a critical role for teachers in designing an effective learning environment and improving the overall content quality. Online readiness is related to teaching presence because the teacher's design and structure will predict the kind of skills and information needed for effective learning. Also, the teacher's feedback impacts the understanding and interaction between student and teacher (Khalid & Quick, 2016). Similarly, cognitive presence greatly impacts the self-efficacy and technical ability of a student to perform learning-based activities (Chatzara et al., 2016). In addition, the social presence forms the basis of motivation and collaboration between students to construct a healthy learning environment through the exchange of information (Giannousi & Kioumourtzoglou, 2016).

Finally, a content quality greatly affects online readiness because it determines the subject matter's complexity and the information required to deal with it (AlMulhem, 2020). Despite the above literature review and arguments, which presents the impact of various factors affecting students' satisfaction level with their online learning experience. There is less evidence reflecting the underlying mechanisms that transmit various social and cognitive factors into positive outcomes related to students' learning. Hence, based on the above arguments, it is expected that online readiness will play the role of an underlying mechanism between all four presences mentioned in the conceptual framework of this study and special need students' satisfaction with the e-learning experience. Thus, the following hypotheses are suggested:

H4a: *Online readiness mediates the association between the teaching presence and students' satisfaction with the e-learning experience.*

H4b: *Online readiness mediates the association between the students' cognitive presence and their satisfaction with the e-learning experience.*

H4c: *Online readiness mediates the association between the students' social presence and their satisfaction with the e-learning experience.*

H4d: *Online readiness mediates the association between content quality and students' satisfaction with the e-learning experience.*

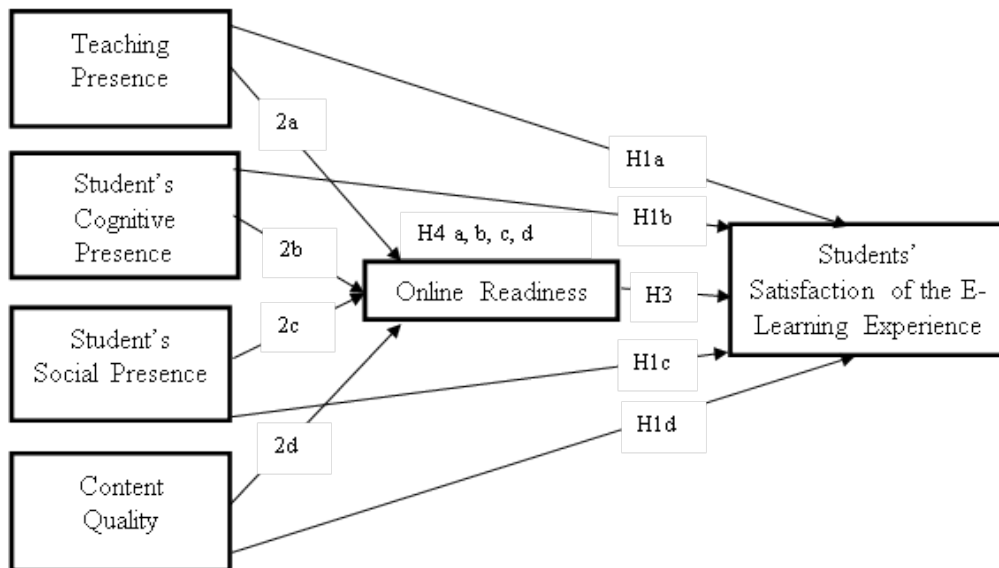


Figure 1. Theoretical framework of the study

Theoretical Framework

Based on the above hypotheses, the theoretical framework of the study incorporates using Garrison's Community of Inquiry framework and online readiness for special students is shown in **Figure 1**.

RESEARCH METHODOLOGY

A quantitative field survey comprised of 38 items was used to collect primary data from students with special needs studying in various campuses of six universities in the South Kalimantan province of Indonesia. These universities were ranked based on being chartered, licensed, or accredited by the appropriate Indonesian higher education-related organization. They offered at least four-year undergraduate degrees (bachelor's degrees) or post-graduate degrees (master or doctoral degrees) and delivered courses predominantly in a traditional, face-to-face, and distance education format. The survey started on 5 August 2020. In the first stage, data of potential participants was obtained by contacting the "Office of the Disability Accommodation" of the universities. In the second stage, students with disabilities were invited to seek their voluntary participation in the study using a link sent to them by email. From this link, they could access information on the research project. While sending links and information about the project, anonymity was assured to all potential participants. In total, 250 potential respondents with disabilities were approached who gave consent to participate in this study. Among all 210 students with special needs returned the filled survey by email. After careful evaluation, it was noticed that some of the respondents gave incomplete responses, so they were excluded from the final response, and this study left with 178 useable questionnaires achieving a response rate of 71.2%.

The survey consisted of 38 items as well as 7 items about demographics. Teaching presence was measured with four items scale adapted from Arbaugh (2007). Students' cognitive and social presence was assessed with a 06 and 4-items scale, respectively, adopted from Arbaugh (2007). A four-item scale adopted from Ozkan & Koseler (2009) was used to measure the content quality, reflecting the students' perception that online module contents were up-to-date, interactive, and supported their learning purposes (Dalle et al., 2020, 2021). A 15-items scale adapted from Joosten & Cusatis (2020) was used to measure online learning readiness. Finally, "students' satisfaction with their online learning experience" was measured using four items adapted from Drennan et al. (2005). A "7-point Likert scale" ranging from "1=strongly disagree" to "7 = strongly agree" was used to assess the response of the students. **Table 1** depicts the respondents' demographic characteristics.

Table 1. Respondents' demographic characteristics

Variables		Number	%age
Gender	Female	81	54.50%
	Male	97	45.50%
Age	18-25 years	74	41.57%
	26-30 years	49	27.52%
	31-35 years	41	23.03%
	36 and above	14	07.86%
Semester of experience with online courses	1-2	81	45.50%
	3-4	59	33.17%
	5-6	27	15.16%
	7- more	11	06.17%
Weekly time for 1 course	less than 1 hour	33	18.54%
	1-3 hour	42	23.59%
	4-6 hours or more	73	41.01%
	7 hours or more	30	16.85%
Degree level	Undergraduate	95	53.37%
	Graduate	74	41.57%
	Post-graduate	9	05.05%
Disability Type	ADD/ADHD	14	07.86%
	Learning disability	11	06.17%
	Psychiatric disability	21	11.79%
	Deaf/hard of hearing	59	33.16%
	Visual	33	18.54%
	brain injury	06	03.37%
	Cognitive/traumatic	08	04.49%
	Mobility disability	17	09.55%
	Other health	09	05.05%

DATA ANALYSIS AND RESULTS

Using SmartPLS 3, study results revealed a positive impact of the students' degree level on their satisfaction level with the e-learning experience. Therefore, it was controlled in all further analyses. Whereas SmartPLS3 was used to analyze the hypothesized paths along with reliabilities, validities, and factor loadings, etc. Tests of validity and reliability were performed to establish the discriminant validity amongst variables. To test the proposed hypotheses, measurement and structural models were analyzed.

Assessment of the Measurement Model

Confirmatory factor analysis; Reliability and validity

To investigate the psychometric properties of the measures, confirmatory factor analysis was conducted using SmartPLS3. "Cronbach's α " and "composite reliability (CR)" were calculated to assess the reliability of measures as per directions provided by (Henseler et al., 2009; Mansoor & Noor, 2019). **Table 2** depicts the reliability of all the reflective measures based on Cronbach's α (above 0.70) and CR values. In addition, measures' "convergent and discriminant validity" was assessed. As "factor loadings" of all indicator variables were \Rightarrow 0.70 with significant loading of each item ($p < 0.01$) onto its underlying variable and "average variance extracted" (AVE) of latent variables was above 0.50 for all study constructs, therefore, "convergent validity" was established (Henseler et al., 2015; Mansoor & Paul, 2021).

Table 2. Factor loadings, reliability, and validity

Constructs/indicators	Factor Loadings						AVE	CR	Cronbach's α
	1	2	3	4	5	6			
Teaching presence							0.523	0.813	0.817
TP1	0.753								
TP2	0.754								
TP3	0.614								
TP4	0.761								
Students Cognitive Presence							0.602	0.900	0.833
SCP1		0.786							
SCP2		0.724							
SCP3		0.790							
SCP4		0.774							
SCP5		0.841							
SCP6		0.733							
Students' Social Presence							0.609	0.861	0.8285
SSP1			0.761						
SSP2			0.791						
SSP3			0.857						
SSP4			0.706						
Content Quality							0.585	0.876	0.805
CQ1				0.789					
CQ2				0.741					
CQ3				0.706					
CQ4				0.788					
CQ5				0.797					
Online Learning Readiness							0.552	0.907	0.844
OR1					0.704				
OR2					0.742				
OR3					0.736				
OR4					0.741				
OR5					0.723				
OR6					0.853				
OR7					0.742				
OR8					0.691				
OR9					0.755				
OR10					0.751				
OR11					0.672				
OR12					0.773				
OR13					0.713				
OR14					0.751				
OR15					0.682				
Students' Satisfaction with E-learning Experience							0.630	0.871	0.811
SSWELE1						0.730			
SSWELE2						0.871			
SSWELE3						0.795			
SSWELE4						0.772			

"Note: CR, composite reliability; AVE, average variance extracted."

While using SmartPLS3, the most appropriate measure of discriminate validity is Heterotrait-Monotrait (HTMT) ratio (Henseler et al., 2015; Noor et al., 2021). The HTMT ratio value should be less than 0.9, as depicted in **Table 3** and **Figure 2** that all values were less than 0.9 for the entire model.

Table 3. Heterotrait-Monotrait ratio

Constructs	Mean	STD.	1	2	3	4	5	6
Teaching presence	5.76	1.01	0.723					
Students' Cognitive Presence	5.23	1.23	0.453	0.776				
Students' Social Presence	5.08	1.80	0.501	0.394	0.780			
Content Quality	5.79	1.03	0.377	0.421	0.382	0.765		
Online Learning Readiness	5.62	1.41	0.523	0.489	0.431	0.399	0.743	
Students' Satisfaction with E-learning Experience	5.18	1.32	0.465	0.542	0.468	0.479	0.401	0.793

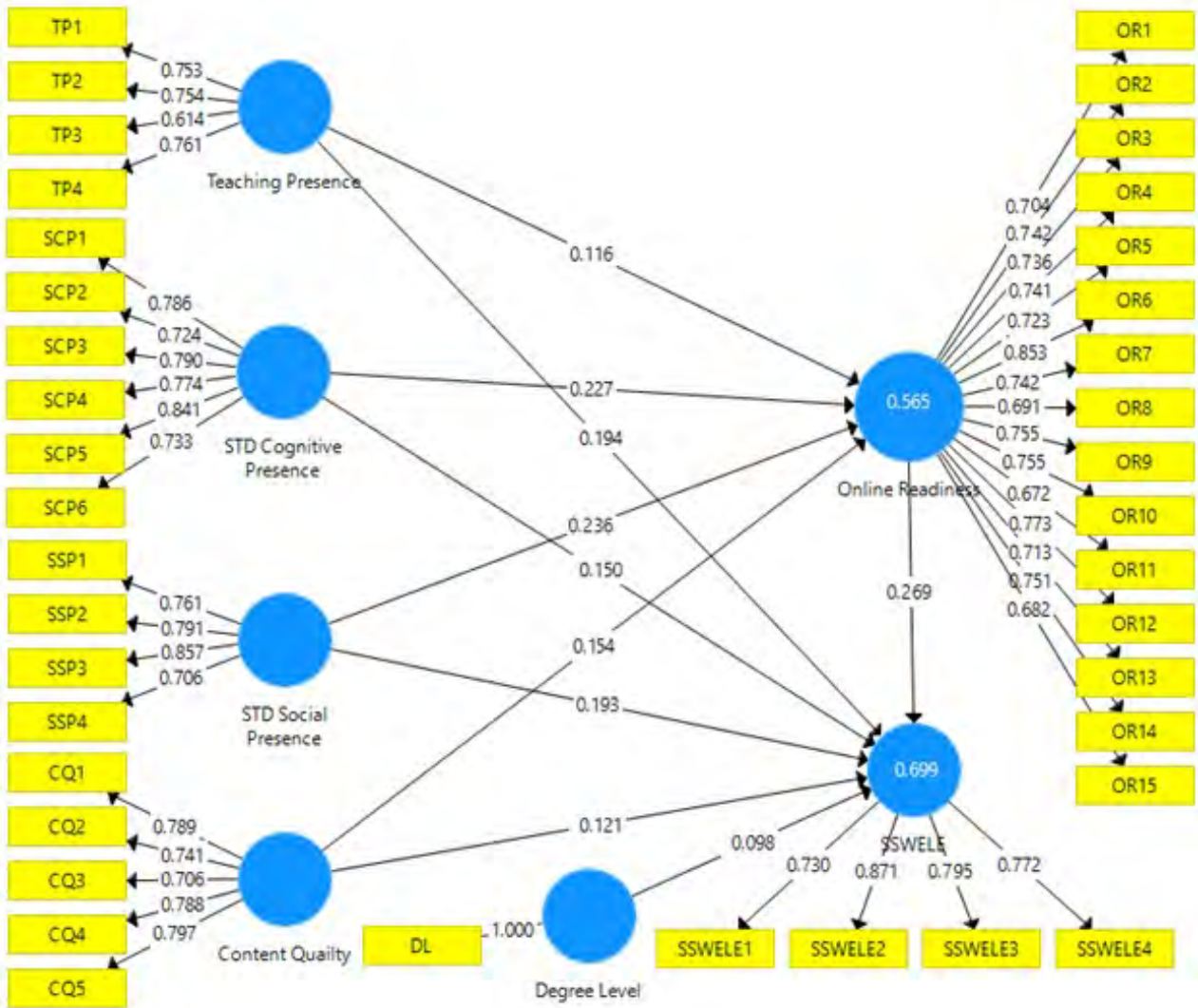


Figure 2. Full measurement model

Assessment of the Structural Model

To assess the structural paths, the Bootstrapping technique was performed, and 500 sub-samples were used to test the hypothesized links (see **Figure 3**). B-coefficient, t-value, and p-value were recorded to confirm the hypothesized relationships. Simultaneously, the Coefficient of Determination (R^2) was used to assess the overall model fitness or change in the model (Mansoor, 2021). The results of the R^2 depicted a 69.9% change in the students' satisfaction level with the e-learning experience due to all direct variables as well as mediating variables. R^2 values reflect good model fitness.

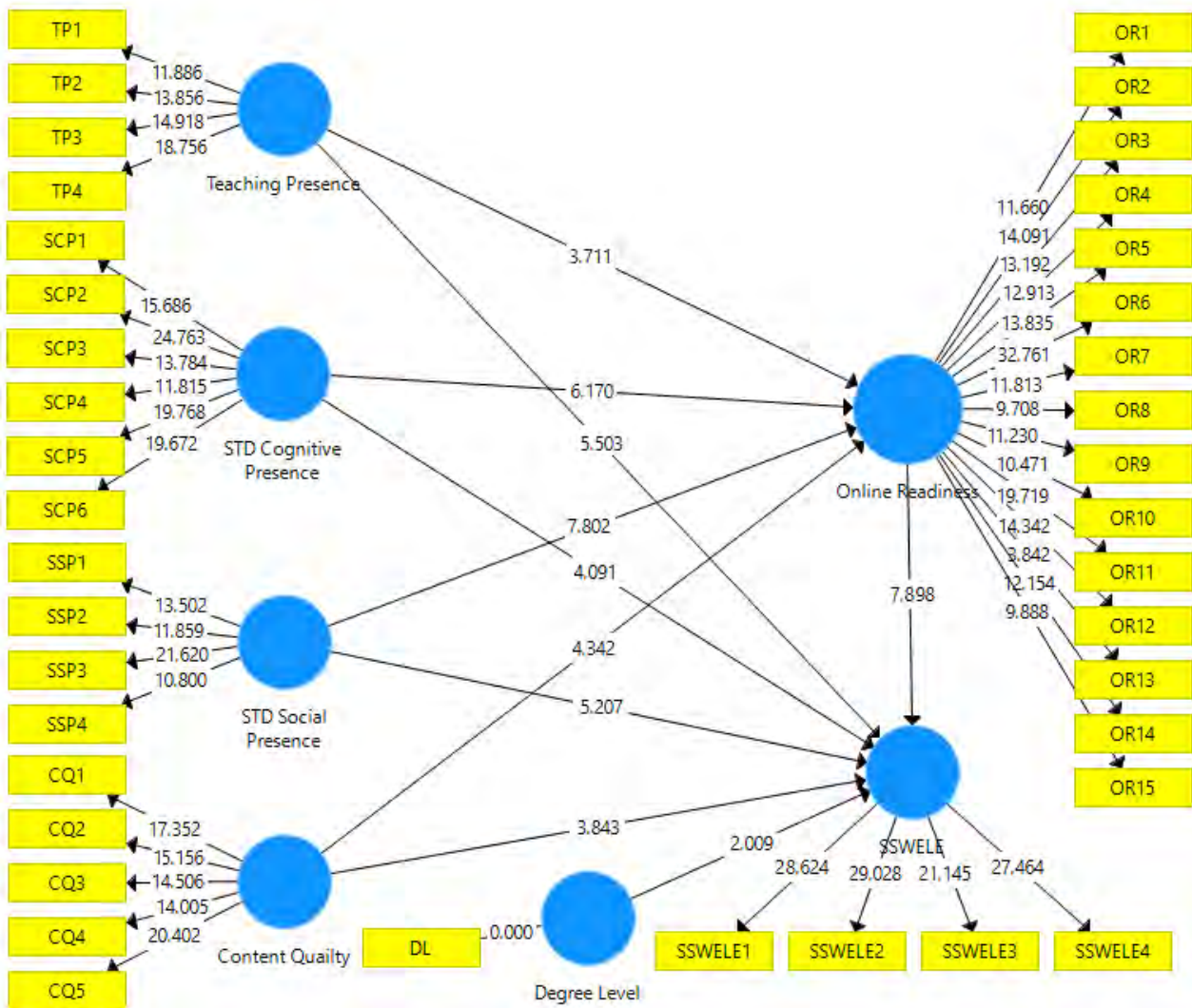


Figure 3. Full structural model

Direct hypothesis

Table 4 depicts the results of the direct as well as an indirect hypothesis. Results reveal a positive and significant association of teaching presence ($\beta = .194^{***}, t = 5.503$), students’ cognitive presence ($\beta = .150^{***}, t = 4.091$) students’ social presence ($\beta = .193^{***}, t = 5.207$), and content quality ($\beta = .121^{**}, t = 3.843$) with students’ satisfaction with e-learning experience. Similarly, results also showed a positive and significant association of teaching presence ($\beta = .116^{**}, t = 3.711$), students’ cognitive presence ($\beta = .227^{***}, t = 6.170$) students’ social presence ($\beta = .236^{***}, t = 7.802$), and content quality ($\beta = .154^{**}, t = 4.342$) with students’ online learning readiness. Students’ online learning readiness was also positively and significantly related to their satisfaction with the e-learning experience ($\beta = .269^{***}, t = 7.898$). Therefore, as shown in Table 4, hypothesis H1 a, b c and d and H2 a, b, c, and d and H3of current study were supported by results.

Mediation hypothesis

As shown in Table 4, the mediation hypotheses H4 a, b, c, d was supported by study results. An indirect and positive effect of teaching presence ($\beta = .211^{***}, t = 6.023$), students’ cognitive presence ($\beta = .141^{**}, t = 3.793$) students’ social presence ($\beta = .123^{**}, t = 3.121$), and content quality ($\beta = .207^{**}, t = 5.832$) with students’ satisfaction with e-learning experience in the presence of students’ online learning readiness as mediator was proved. Further, results showed the non-zero value for the lower and upper limit confidence interval supporting the significance level of findings.

Table 4. Hypothesis testing results

	Hypotheses	Std. Beta	t-Value	p-values	Findings
H _{1a}	TP → SSWELE	0.194	5.503	0.000	Supported
H _{1b}	SCP → SSWELE	0.150	4.091	0.001	Supported
H _{1c}	SSP → SSWELE	0.193	5.207	0.000	Supported
H _{1d}	CQ → SSWELE	0.121	3.843	0.012	Supported
H _{2a}	TP → OR	0.116	3.711	0.017	Supported
H _{2a}	SCP → OR	0.227	6.170	0.000	Supported
H _{2a}	SSP → OR	0.236	7.802	0.000	Supported
H _{2a}	CQ → OR	0.154	4.342	0.002	Supported
H ₃	OR → SSWELE	0.269	7.898	0.000	Supported
H _{4a}	TP → OR → SSWELE	0.211	6.023	0.000	Supported
H _{4bc}	SCP → OR → SSWELE	0.141	3.793	0.016	Supported
H _{4c}	SSP → OR → SSWELE	0.123	3.121	0.021	Supported
H _{4d}	CQ → OR → SSWELE	0.207	5.832	0.000	Supported

Where: TP: Teaching presence; SCP: Students Cognitive Presence; SSP: Students' Social Presence; CQ: Content Quality; OR: Online Learning Readiness; SSWELE: Students' Satisfaction with E-learning

DISCUSSION

Findings of the Study

This study used the community of inquiry framework to determine special needs student's satisfaction with the e-learning experience. The study also used content quality and online readiness to test their impact on student's satisfaction with the e-learning experience as the current pandemic has caused most educational institutions to shift towards e-based learning methods. Many concerns have arisen regarding the effectiveness of this method due to its sudden implementation to replace face to face learning methods. The most important is the students' satisfaction with online learning. Among various studies conducted on student satisfaction, only a few have investigated the needs of special students with different disabilities (Chatzara et al., 2016). This study shows that teaching presence plays a vital role in building the overall satisfaction of student's e-learning experience, which is in line with previous literature (Khalid & Quick, 2016). The most important factor in teaching special needs student is to convey useful information conveniently that aids in learning and help to build understanding (Chukwuemeka & Samaila, 2020). This study showed that the instructor should make the course design highly accessible using different systems and apps to ensure flexibility and ease of use. The teacher should always ensure effective communication between the learner and the instructor. To address any ambiguities, a teacher should ensure presence both online and through emails for seamless communication (Caskurlu et al., 2020). A teacher should also provide clear instructions and expectations regarding the course and, in return, enhance students' performance.

The current study also showed that cognitive presence has a positive and significant impact on special needs students' satisfaction with the e-learning experience, which is also supported in previous studies (Akyol & Garrison, 2008; Redmond, 2014). To achieve this objective, the course should provide enough triggers that arouse interest and make students ponder over the puzzling question to initiate critical thinking and discussions. The cognitive process is also important for the healthy brain development of students with certain disabilities (Zhai et al., 2017). Therefore, it is inferred that the success of the overall inquiry framework relies on the student's cognitive presence. Hence the overall structure of the course must be cohesive to facilitate and engage learners.

Aligned with previous studies, the current study revealed that the students' social presence had a positive and significant impact in increasing their satisfaction with the e-learning experience (Annand, 2011; Lowenthal, 2010). The students participate and engage more actively when they develop strong bonds between group members. It also reduces anxiety and stress for following up with deadlines and exams. Also, constructive discussions within the group lead to cognitive discourse as they attract students to participate in various activities during online sessions (Kumar, 2021). Hence, courses with an innovative design that

encourage active participation and interaction between learners attract students to participate in group activities, further satisfying their overall learning experience.

This study also found a positive and significant relationship of content quality with students' satisfaction with the e-learning experience, which is also in line with the literature (AlMulhem, 2020). Previous studies reflect that content quality plays an important role in special needs students' performance (Domínguez-Quintero et al., 2018), as it constitutes the foundation of learning; hence it affects the understanding, interaction, and cognitive skills necessary to process the laid-out instructions. Adding to that, online readiness was found to be mediating between the student's satisfaction with the e-learning experience and teaching presence which is an important contribution of the current study. These findings suggest that the teacher needs to have sound knowledge about the systems and software involved in creating a meaningful experience. Besides, the instructor should be more interactive by creating open communication accessibility through asynchronous systems like email, recorded lectures on google classroom, YouTube, etc., so that the student can access it at convenience (Chung et al., 2020). Additionally, using an asynchronous system like instant messaging on WhatsApp, video call through skype or Microsoft teams, etc., also facilitates the students to learn at their best capacity.

Online readiness also mediated the association between the cognitive presence and student's satisfaction with the e-learning experience as to critically process and derive the meaning of the overall learning material; it is important for students to have thorough knowledge and information about how to access different apps and systems involved and how to follow instructions (Warden et al., 2020). Finally, online readiness was found to be playing a mediating role for social presence to increase student's satisfaction with the e-learning experience as it has been found in the literature that more time spent on social networks increases ease of use and online readiness (Küsel et al., 2020). In the end, online readiness was found to be mediating between content quality and student's satisfaction with the e-learning experience. As discussed before, content quality is directly linked with increasing satisfaction of student learning experience; therefore, online readiness improves the overall interaction and seamless communication between instructor and learner.

Theoretical Implications

This study has made several theoretical advances. First of all, the current study utilized the community of inquiry framework while examining the impact of various social and cognitive factors on students' satisfaction level with e-learning experience, which has rarely been explored in literature. Moreover, including teaching' presence, content quality, students' social and cognitive presence and online readiness in a single conceptual model for empirical investigation is an important contribution of the current study, especially in the days of crises like COVID-19 where all the educational institutions are facing issues of connectivity with the students (Samaila et al., 2020b). Thus, the current study has opened future research avenues to use other such models and relevant theories with online readiness and students' satisfaction with the e-learning experience to bring important policy insights for the practitioners. The current study also contributes to building an understanding of special needs students and factors affecting their satisfaction; therefore, the educational institutions, educational leaders, and teachers can consider the discussed factors to facilitate the special needs students to gain maximum benefit from the online sessions. This study also contributes to dealing with challenges the higher education sector faces in the current pandemic, where e-learning has suddenly emerged as a mandatory part of the continuing learning process. This study shed light on the process to help understand how special needs student satisfaction can be increased by delivering an interactive program that builds on their cognitive and social presence. Another major advantage of this research is collecting data from special need students of Indonesian higher education institutions. Such attempts in literary circles, especially from developing Asian countries, are scarce, and empirical evidence would help conceptualize further growth in the field.

Practical Implications

This study has various implications for teachers, educational leaders, and policymakers. Special needs students are an important part of society, and they need special care and attention (Rasmitadila, 2020),

especially while facing a crisis like COVID 19 pandemic. Thus, based on the importance of teachers' presence as depicted by the study results, the developers and teachers should take caution in designing a course that ensures students' satisfaction with the e-learning experience. They should focus on giving clear instructions and offering multiple teaching methods that are accessible to the student. The instructor should also encourage real-time interaction beyond the classroom to develop understanding and address ambiguities. In addition, it is an instructor's job to provide an environment where students feel closer to each other and can share their ideas, concerns, and mutual interests. The instructor needs to set clear expectations for participants on how to be a productive member of the community. As the literature suggests that, the case-study scenario and what-if questions also trigger critical thinking (Lee et al., 2020). Thus, quizzes, time-series, and activity-based training sessions also help students build and acquire critical discourse by contributing cognitive presence. Besides, there is a need to devise innovative teaching practices and processes to encourage students to socially participate in online learning sessions by engaging them in simple and distinctive tasks. Adding to that, the immediate evaluation system based on short term activities can also attract students to be cognitively active and participative in online sessions. Moreover, all these general implications should be customized for students with special needs, and before implementing any new e-learning policy, the online readiness of special need students should be assessed and affirmative action to be taken to facilitate the students with special needs in higher education institutions. Hence, this research not only provided insights for global policymakers and scholars but has also attempted to grab the attention of Indonesian scholars and policymakers towards the necessity of a customized learning environment for students with special needs during current and post pandemic era.

Limitations and Future Directions

Although the researcher tried to cover most of the areas regarding the students' satisfaction in detail, there are some limitations as this study was conducted in a cross-sectional time setting and data was collected through structured survey items, which showed the impact and significant limitations but cannot cover detail feelings and emotions of these students. Although bootstrapping was performed to increase the generalizability of this research on a larger data set. But still, the data of 178 students from only one province of Indonesia is less to generalize the findings of this study. Future studies may consider this limitation and collect data from larger samples in a wider geographical area. Also, this study focused on special needs students; in general, any specific disability was not highlighted. Future studies can focus on what activities arouse the greatest cognitive triggers in special needs students. Future studies can also focus on the specific types of disabilities like hearing or sight or brain-related illness or physically impaired and what challenges are faced by those students, and what kind of course structure and the online interactive system can best suited for their needs. Future studies can also include more in-depth interviews and focus group discussions of parents and teachers who work together to support learning for these students and what challenges are faced by them when creating a learning environment for students with special needs. A comparative study of students with special needs and normal students measuring both group satisfaction and e-learning readiness will help to answer many unanswered questions in literature and will shed light on multiple unexplored areas that the current study failed to capture due to time and resource constraints. Similarly, a cross-cultural study comparing the satisfaction and e-learning readiness of special need students from two different geographical regions will help shed light on many grey areas in this field. Such research attempts will surely help to advance the literature in this stream of research.

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