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Factors contributing to online learning satisfaction during COVID-19 pandemic in higher education in Indonesia

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ABSTRACT

The learning process has turned into online learning during pandemics to prevent transmission. Limited research has looked at the contributing factors to students' satisfaction as one of the crucial aspects of online learning. This study investigated the determinants of online learning satisfaction among undergraduate students in Indonesia during the pandemic. About 267 students (aged 17-28, M = 20.07, SD = 1.40) were participated in this study through accidental sampling technique. This study applied a quantitative approach with six instruments: online learning satisfaction, online learning readiness, academic stress, learner-content interaction, learner-learner interaction, and learner-instructor interaction. Multiple regression analysis showed that online learning readiness and learner-content interaction were contributed significantly to online learning satisfaction (R2 = .36, F (2,262) = 36.80, p <.001). Furthermore, learner-content interaction had a more considerable contribution (b = 1.41, p <.001) to online learning satisfaction than online learning readiness (b = .15, p =.03). This current study has successfully examined contributing factors to online learning satisfaction comprehensively. The involvement of three types of interactions in this study provides a comprehensive picture of the various forms of interaction in online learning and their impact on online learning satisfaction. The theoretical and practical implications of this study are discussed.

Keywords: higher education, Indonesia, online learning satisfaction, pandemic COVID-19

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INTRODUCTION

The COVID-19 pandemic has brought significant changes in all aspects of human life, especially in how education is shifting from face-to-face meetings (conventional learning) to online learning. Online learning becomes necessity for education in responding to the pandemic COVID-19 (Dhawan, 2020). However, due to the many limitations of online learning in emerging countries, online learning satisfaction during the COVID-19 pandemic is an issue in developing countries, including Indonesia. Several studies were undertaken on online learning satisfaction during the pandemic to reveal single factors contributed to it in Indonesia (Akmal & Kumalasari, 2021; Rohayani et al., 2015; Suhandiah et al., 2022). To provide a more comprehensive picture of Indonesia's student population, this study examines the various factors that simultaneously influence online learning satisfaction by referring to the theory of Dziuban et al. (2015), particularly during the COVID-19 pandemic.

The accessibility of online learning ease the students to learn at any time, from any location (Sujarwo et al, 2020). However, there are several challenges in implementing online learning in developing countries, such as facility limitations, students' and teachers' readiness, culture and personal barrier, technical and digital competencies, English skills, the need for face-to-face interaction and resistance to change (Issa & Jaaron, 2017; Qureshi et al., 2012). A similar finding in Indonesia by Haryati et al (2021) showed that the digital infrastructure is not fully developed

to support online learning adequately. In other words, despite its flexibility, online learning in emerging countries have many limitations.

Online learning success or failure is determined by the degree to which students' were satisfied or dissatisfied with their learning process (Suryani & Sugianingrat, 2021). According to Alqurashi (2019), online learning satisfaction reflects how students perceive their online learning experience and is considered an essential element for evaluating online learning. Satisfaction is the primary indicator of learning success, particularly in the online setting (Dziuban et al., 2015; Kuo et al., 2014a). Furthermore, a number of studies have found that satisfaction with online learning is highly correlated with lower dropout rates, self-determination, motivation and commitment to complete education and success rates (Ali et al., 2011; Hart, 2012).

Online learning satisfaction during COVID-19 pandemic is an issue in developing countries. A study in Pakistan found that online learning does not generate the expected outcomes regarding students' motivation. This finding was related to the fact that most students had technical and financial barriers to gain internet access and the absence of direct contact with the instructor (Adnan & Anwar, 2020). In Indonesia, a study of 224 undergraduate students from 26 universities found that 40% of students had low satisfaction with online learning due to the limitation in internet access and lack of lecturers attachment and guidance (Surahman & Sulthoni, 2020). Similar findings also shown in Priyastuti and Suhandi (2020)'s study that found the majority of students felt dissatisfied with online learning related to their level of comprehension towards the learning material and teaching and learning process. Another study by Napitupulu (2020) with 384 undergraduate students in IAIN Padang Sidimpuan also showed that students were dissatisfied with online learning methods and lecturers' abilities to deliver material in the online context. Therefore, online learning satisfaction during COVID-19 pandemic in Indonesia should be addressed.

Prior studies indicated several factors that determine students' online learning satisfaction. First, online learning readiness (Akmal & Kumalasari, 2021; Drane et al., 2020; Rohayani et al., 2015; Suhandiah et al., 2022). Online learning readiness refers to psychological readiness, consisting of self-directed learning, learning motivation, self-control, and the efficacy of operating computers and communicating online (Hung et al., 2010). Online learning readiness can affect learning outcomes, learning satisfaction and students' desire to be resilient or to complete the learning process (Joosten et al., 2020). Joosten found that student with higher online learning readiness (i.e., online learning efficacy) tend to perceive higher online learning satisfaction. In the context of online learning during COVID-19 pandemic, the readiness to involve in online learning is problematic due to the suddenness of the shifting from face-to-face learning to online learning. Therefore, online learning readiness should be noted in the research on online learning during COVID-19 outbreak.

The second factor that affects student satisfaction in online learning is academic stress (Cazan & Truța, 2015; Chraif, 2015; Kumalasari & Akmal, 2021; Lee & Jang, 2015; Tri & Sari, 2017). Academic stress refers to the physical and psychological impact that students experience as a consequence of the continual changes and demands due to the learning process (Gadzella, 1994; Ota et al., 2016; Sun et al., 2011b). The unpredicted changes from in-person learning to online learning due to the covid outbreak affects students' readiness to participate in the learning process and is a potential stressor. Therefore, academic stress should be involved in research regarding online learning during the COVID-19 pandemic.

Lastly, students' satisfaction with online learning is also affected by how they interact with their teacher (learner-instructor interaction), their peers (learner-peer interaction), and learning materials (learner-content interaction) (Alqurashi, 2019). Learner-content interaction refers to the intellectual interaction with content that leads to changes in the learner's knowledge, viewpoint, or cognitive structures (Moore, 1989), while learner-instructor and learner-learner interaction refers to an interpersonal and reciprocal exchange between two parties mediating learning activity (Xiao, 2017). Kuo et al. (2014) found that interactions experienced by students with learning materials and teachers were strong predictors of online learning satisfaction. Despite interaction with material content, teachers and other students play a significant role in online learning but are

often absent in the early process of online learning (Abrami et al., 2011). Therefore, interaction is one of the variables that must be considered in research on online learning.

Considering the importance of online learning satisfaction for students and their learning process during the pandemic, it is essential to investigate the factors that contribute to online learning satisfaction among undergraduate students in Indonesia. Several studies were undertaken on online learning satisfaction during the pandemic to reveal factors contributed to it in Indonesia, such as online learning readiness (Akmal & Kumalasari, 2021; Rohayani et al., 2015; Suhandiah et al., 2022), academic stress (Kumalasari & Akmal, 2021; Tri & Sari, 2017), and student experience (Suhandiah et al., 2022).

On the other hand, the role of interaction on online learning satisfaction in the context of students in Indonesia remains understudied despite the fact that Indonesia has a collectivist cultural orientation. Indonesian students need interaction with others to feel a social presence in their online learning activities (Tantri, 2018), and teachers' willingness to adapt to the new learning process is needed (Herawati et al., 2022). Thus, the current study addressed a research gap addressing the factors influencing online learning among undergraduate students in Indonesia during the pandemic since it is a lack of research that investigates all of these factors simultaneously.

Therefore, to provide a comprehensive understanding of the factors influencing online learning satisfaction, we aimed to simultaneously examine the role of online learning readiness, academic stress and students' interaction on online learning satisfaction among undergraduates in Indonesia. This study is projected to contribute to the advancement of psychology, specifically educational psychology, by addressing the topic of online learning satisfaction. The findings of this study will also likely be utilized as a foundation for developing appropriate interventions aimed at increasing online learning satisfaction by improving the aspects that contribute to it.

METHOD

We carried out a quantitative approach with a cross-sectional study and an associative design to test the hypotheses. This study has been approved by by the ethics committee of Lembaga Penelitian Universitas YARSI with the number: 027/KEP-UY/BIA/I/2021. Research participants were recruited using the accidental sampling method, with participants being active undergraduate students who have experienced the online learning process at public or private universities in Indonesia. Questionnaires were distributed online to student networks. Prospective participants were reached out to through social media communities, student bodies, and the lecturer's professional connections. On the landing page of the link, we ensured that participants were fully informed and gave their agreement regarding the approach for collecting data. The students who agreed to take part in the study successfully finished the survey by clicking the "Next" button. A total of 267 students aged 17-28 years old (M=20.07, SD=1.40) were participated in this study.

We used four instruments to measure each variable. The first instrument was *Student Satisfaction with Online Learning* sub-scale *engaged learning* developed by Dziuban et al., (2015) is used to measure online learning satisfaction. This instrument consists of ten items on a Likert scale with six responses (1= strongly disagree, 6= strongly agree). Higher total scores indicate higher students' satisfaction with online learning. This scale had been proven reliable, with a Cronbach alpha coefficient of .94 and item validity ranging from .68 to .80.

The second instrument was Online Learning Readiness Scale (OLRS) developed by (Hung et al., 2010) is used to measure to what extent students are ready for online learning. This instrument consists of 18 items on a Likert scale with six responses (1=strongly disagree, 6=strongly agree). Higher total scores indicate higher students' online learning readiness. This scale had been proven reliable, with a Cronbach alpha coefficient of .89 and item validity ranging from .41 to .66.

For the third instrument, we modified the Stressor Scale for College Student subscale developed by Ota et al. (2016). The modifications were made by adding the online learning context in the items and modifying the sentences, which initially measured the source of stress into individuals perceived stress. Students sources of academic stress are task demands, the number of subjects attended, difficulties in managing time, and difficulties in understanding the

material. This variable was measured using seven items in a Likert scale format (1 = Strongly disagree to 6 = Strongly agree). The higher the total score indicates, the higher the academic stress experienced by students. This scale had been proven reliable, with a Cronbach alpha coefficient of .86 and item validity ranging from .55 to .69.

Lastly, to measure interaction, we used Learner-content Interaction (LCI), Learner-Instructor Interaction (LII) and Learner-Learner Interaction (LLI) measurement developed by Kuo et al. (2014). This instrument consists of 18 items (4 LCI items, 6 LII items, and 8 LLI items) in a Likert scale format (1 = Strongly disagree to 5 = Strongly agree). The higher the total score in each section, the more intense the student's interaction with content/instructors/ other students. These scales had been proven reliable, with a Cronbach alpha coefficient of .82 (LCI), .79 (LII), .87 (LLI) and item validity ranging from .42 to .78, from .40 to .63 (LII), from .61 to .70 (LLI).

To test the research hypothesis, we employed multiple regression analysis. Multiple regression will inform the contribution of each predictor variable (online learning readiness, academic stress, learner-content interaction, learner-instructor interaction and learner-learner interaction) simultaneously towards criterion variable (online learning satisfaction). Before executing the multiple regression test, the assumptions are validated to guarantee that the regression test can be conducted. The residual normality and multicollinearity tests are performed as the assumption test. JASP 0.14.1.0 software was used to conduct statistical testing.

FINDING AND DISCUSSION

Finding

The description of the research participants is shown in table 1. From table 1, participants in this study consisted of 75.65% female and 24.35% male, 68.54% of participants were students from private universities, while the remaining 31.46% were students from state universities. Participants in this study comprises of various scientific groups such as health sciences, social sciences and humanities, science and technology and education. Participants are undergraduate students who are taking their first year to the sixth year. Regarding the tools for learning, the majority of participants have private device for learning, such as laptop, tablet or cellphone (67.8%) and have own internet access at home (87.22%). Meanwhile, the descriptive data of each research variable is shown in table 2.

Table 1. Demographic Data

Demographic Variable	Frequency (N=267)	Percentage (%)
Sex		
Male	65	24.35
Female	202	75.65
Year		
Year-1	42	15.73
Year-2	135	50.56
Year-3	48	17.98
Year-4	38	14.23
Year-5	2	.75
Year-6	2	.75
University		
Public	84	31.46
Private	183	68.54
Major		
Health Sciences	49	18.35
Social and Humanities	174	65.17
Science and Technology	37	13.86
Teacher Education	7	2.62
Online Learning Device		
Private device	181	67.8
Shared device	86	32.2
Internet Accessibility at Home		
Yes	221	82.77
No	46	17.22

Table 2. Descriptive Results

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Learner-content Interaction	267	4	24	16.22	3.63
Learner-Instructor Interaction	267	10	72	35.68	15.12
Learner-Learner Interaction	267	11	42	32.68	6.04
Online Learning Readiness	267	26	108	88.56	10.85
Academic Stress	267	7	42	28.28	7.19
Online Learning Satisfaction	267	10	60	38.08	11.46

Score Classification

To capture the spectrum of each variable from the data, we classify all variables (learner-content interaction, learner-instruction interaction, learner-learner interaction, online learning readiness, academic stress and online learning satisfaction) into three levels: low, moderate and high. This classification is set up based on the hypothetical score of each variable's total score. The classification of each variable is shown in table 2. From table 2, we can see that most participants have a high level of learner-content interaction (59.2%), a high level of learner-instruction interaction (86.89%), a high level of learner-learner interaction (69.29), a moderate level of academic stress (49.81%) and a moderate level of satisfaction with online learning (43.32%). In comparison, 37.08% have a high level of satisfaction, and only 17.6% have a low level of satisfaction with online learning.

Table 3. Range of Scores and Classification of Scores

Variable	Level	Hypothetical Score	N	Percentage (%)
Learner-Content Interaction	Low	4-9	12	4.5
	Moderate	10-15	95	35.58
	High	16-20	160	59.92
Learner-Instruction Interaction	Low	6-13	2	0.75
	Moderate	14-22	33	12.36
	High	23-30	232	86.89
Learner-Learner Interaction	Low	6-17	6	2.25
	Moderate	18-29	76	28.46
	High	30-40	185	69.29
Online Learning Readiness	Low	6-39	1	0.37
	Moderate	40-74	37	13.86
	High	75-108	229	85.77
Academic Stress	Low	7-18	28	10.49
	Moderate	19-30	133	49.81
	High	31-42	106	39.7
Online Learning Satisfaction	Low	10-26	47	17.6
	Moderate	27-43	121	43.32
	High	44-60	99	37.08

Inter-variable Correlation

Based on the intercorrelation matrix in table 4, online learning satisfaction was significantly and positively correlated with learner-content interaction ($r=.58$, $p<.001$), learner-instructor interaction ($r=.58$, $p=.008$), learner-learner interaction ($r=.37$, $p<.001$) and online learning readiness ($r=.47$, $p<.001$). On the other hand, online learning satisfaction was not correlated with academic stress ($r=-.11$, $p=.078$). In other words, students with higher online learning readiness tend to be more engaged in the interaction with course material, instructors and other students and more satisfied with their online learning.

Table 4. Intercorrelation matrix

Variable	1	2	3	4	5
1. Learner-content Interaction					
2. Learner-Instructor Interaction	.15*				
3. Learner-Learner Interaction	.46***	.14*			
4. Online Learning Readiness	.60***	.16**	.60***		
5. Academic Stress	-.26***	-.08	-.008	-.19	
6. Online Learning Satisfaction	.58***	.16**	.37***	.47***	-.11

* p < .05, ** p < .01, *** p < .001

Multiple Regression Analysis

Table 5. Multiple Regression Analysis

Model	Coefficient unstandardized		Standardized coefficient	t	Sig	VIF
	B	Std Error	Beta			
(Constant)	-3.584	4.526				
Learner-content Interaction (X_1)	1.414	.199	.448	7.126	<.001	1.619
Learner-Instructor Interaction (X_2)	.048	.038	.064	1.274	.20	1.033
Learner-Learner Interaction (X_3)	.113	.119	.060	.947	.344	1.617
Online Learning Readiness (X_4)	.157	.074	.149	2.135	.03	1.998
	R^2 = .36					
	F (2,262) = 36.797, p <.001					

Prior to testing the hypothesis using the multiple regression, the assumptions were validated using normality and multicollinearity tests. A significance value of .200 was reached using the Kolmogorov-Smirnov approach with the residual normality test. Because the significance value exceeds .05, we may assume that the data is normally distributed and conforms to the normality assumption. The collinearity assumption test findings in table 5 indicate that all variables have a VIF value less than 10. It demonstrates no perfect multicollinearity while all variables are correlated (Table 4).

Multiple regression analysis was employed to test the hypothesis in this study. Academic stress was not included in this analysis because there was no correlation between online learning satisfaction and academic stress. Therefore, there were only four predictors in this analysis: learner-content interaction, learner-instructor interaction, learner-learner interaction, and online learning readiness. From table 5, it can be seen that the significance value is < .001 with a value of F = 38,048 indicated that the hypothesis was accepted Furthermore, this model could explain 36% of the variance in online learning satisfaction. In other words, 64% of online learning satisfaction could be predicted by other factors that not measured in this study.

From the four predictors, only two predictors were significant in predicting online learning satisfaction: learner-content interaction (p<.001) and online learning readiness (p=.03). Meanwhile, learner-instruction and learner-learner interaction were found not significant in predicting online learning satisfaction. By looking at the beta coefficient, both learner course interaction and online learning readiness positively contributed to online learning satisfaction. However, learner-content interaction had a more considerable contribution to online learning satisfaction than online learning readiness. The regression equation based on the results in Table 5 shows that $Y = -3.584 + 1.414\ X_1 + 0.157\ X_4$. Based on the equation, the increasing 1 score in learner content interaction will be followed by increasing online learning satisfaction by 1.414. Meanwhile, the rising 1 score in online learning readiness will increase online learning satisfaction by .157.

Discussion

Overview of online learning satisfaction levels

This current study captured how satisfied participants with online learning and resulting that majority of participants experience moderate to high level of satisfaction with online learning. This finding is contrary to similar research conducted in the early of pandemics that most of

participants felt dissatisfied with online learning, both in Indonesia (Napitupulu, 2020; Priyastuti & Suhandi, 2020; Surahman & Sulthoni, 2020) and other developing countries (Adnan & Anwar, 2020; Issa & Jaaron, 2017). The possible explanation for this contrast finding is the time of data collecting. The previous studies collected data in the early pandemics when the learning process had just switched to online learning. Meanwhile, the data gathering for this study was around one year after the pandemic started. In other words, previous studies capture participants' online learning satisfaction during the emergency transition period, while the current study capture participants' online learning satisfaction during the post-transition period when they are more familiar with online learning than previous studies. This explanation is supported by Aldhahi et al. (2021)'s finding that more experience in e-learning led to more efficacy in online learning and increased student satisfaction with online learning. Another possible explanation is due to the availability of online learning resources. In this study, most participants have adequate resources to do online learning, such as internet access and personal device (laptop, cell phone or tablet). It is different with study of Adnan and Anwar (2020) that the majority of their participants lack of internet connection and had technical issue to participate in online learning optimally.

Significant predictors of online learning satisfaction

This study aimed to investigate the contribution of online learning readiness, academic stress and interaction variables simultaneously towards online learning satisfaction. The results indicated that only online learning readiness and learner-content interaction were the significant predictors of online learning satisfaction. Furthermore, learner-content interaction was found to contribute to online learning satisfaction more than online learning readiness. The results obtained in this study strengthen past studies that found the most powerful indicator of student satisfaction with online learning was learner–content interaction, in sample of undergraduate (Kuo et al., 2014) and high school students (Zhang & Lin, 2020), and online learning readiness (Kumar, 2021; Wei & Chou, 2020). Gameel (2017) also found that learner-content interaction is the essential factor in affecting student satisfaction with online learning, while learner-instructor and learner-learner interaction are not.

Interaction is a crucial element in the learning process (Thach, 2018; Zimmerman, 2012). Among the three types of interaction proposed by Moore (1989), this study found that only learner-content interaction was significantly contributed to student satisfaction with online learning. This finding implies that learner interaction with instructors or other learners is less significant than learner-content interaction in terms of learner satisfaction. In contrast, past research concerning the interaction variable had been focused on reciprocal interpersonal interaction, such as learner–learner and learner–instructor interactions (Zimmerman, 2012), whereas learner–content interaction received significantly less research attention, whereas it had a vital role in assuring student learning experience (Xiao, 2017). Therefore, this finding can stimulate future research regarding learner-content interaction in an online learning setting to help students increasing their satisfaction with the learning process.

Learner-content interaction reflects the students' evaluation regarding the materials provided in several aspects, such as connectivity with real life, the ease of accessing and understanding the material and compelling interest (Kuo et al., 2014) Furthermore, learners' interaction with content triggers an internal intellectual discourse, resulting in changes in the learner's knowledge, point of view, or cognitive structures (Moore, 1989). In other words, the higher interaction learner with course content indicates the easier they can access and understand the course material, the more connection they can build between course material and everyday life phenomena, and the more interested they are with the course. In this study, online learning satisfaction is seen from how engaged students are in online learning activities (Dziuban et al., 2015). Therefore, this study found that learner-content interaction had the strongest contribution towards online learning satisfaction. The more interaction students with learning content determine their satisfaction with online learning.

In this study, online learning readiness was also found as the significant predictor of online learning satisfaction. Online learning readiness indicates students' independence, initiative, and efficacy regarding skills needed to participate in online learning (Hung et al., 2010). Online

learning readiness promoted student engagement with academic activities (Joosten et al., 2020; Kim et al., 2019). The higher student readiness, both in soft skills and hard skills needed in online learning, the more engaged they are with learning activities and further enhance their satisfaction with online learning.

Non-significant predictors of online learning satisfaction

The non-significance contribution of learner-instructor and learner-learner interaction might be attributable for some reasons. The first reason is the nature of learning. Based on the independent learning and teaching's theory, distance learning is a learning system where the instructor and learner communicate with non-human mediums such as print, electronic etc (Xiao, 2017). Therefore, the intense interaction between learner and learning material provided by the instructor would determine how deep their online learning experience is. The interaction between learner and other learner and instructor may support the learning process, but learning is more than interaction with external sources. Learning is the internal process in which learners experience the changes in their cognitive structures (Moore, 1989). Consequently, how satisfied students with online learning depends more on their intellectual interaction with course content than with the instructor and other students. The second reason is those three interaction types are interconnected, with the learner-content interaction as the foundation of the other two types of interaction (Shackelford & Maxwell, 2012). The lack of student interaction with the instructor and/or other learners can be substituted with other strategies. Still, the lack of student interaction with course content would impact their learning outcomes (Xiao, 2017).

Limitations and future directions

While this study expands on prior research related to online learning during pandemics in Indonesia, there are some shortcomings that should be addressed in future research. First, inconsistent with prior research related to the academic stress (Kumalasari & Akmal, 2021), we fail to prove its effect on online learning satisfaction. One of the possible causes for this result is that data collection was carried out after approximately one year of COVID outbreak, while Kumalasari and Akmal (2021) study were conducted when the pandemic had just occurred. Students are most likely already used to and adapted to the pandemic situation and the online learning process so that it is no longer a stressor that affects student learning satisfaction. Therefore, further research can expand current research by examining other variables that better describe how students can deal with stress during the pandemic (e.g., coping stress, self-regulated learning, and academic resilience). Second, student satisfaction with the online learning process is only represented by the learning subscale involved. Future research can expand on current study by exploring all factors of students' satisfaction in online learning process (e.g., engaged learning, sense of agency and assessment; Dziuban et al., 2015); in order to get a more comprehensive understanding of its construct.

CONCLUSION

This research has successfully examined the factors that contribute to online learning satisfaction quite comprehensively. The involvement of three types of interactions in this study provides a comprehensive picture of the various forms of interaction in online learning and their impact on online learning satisfaction. This study provides evidence that factors contributing to online learning satisfaction were learner-content interaction and online learning readiness. Learner-content interaction had the greater contribution towards online learning satisfaction than online learning readiness. On the other hand, learners' interactions with other learners and instructors did not significantly affect their satisfaction with online learning.

The results of this study generate some practical implications for students, education institutions and instructors. For students, considering the importance of online learning readiness towards online learning satisfaction, it is suggested to improve their online learning readiness by finding out how to enhance their skills needed in online learning. Furthermore, education institutions should provide training or preparation programs for students before and during their

online courses. For the lecturer, considering the vital role of learner-content interaction, it is suggested to provide learning material that is easily accessed, easy to understand, engaging, and interactive to stimulate students to interact more with course content. Furthermore, education institutions should provide training to improve lecturer skills in designing effective and efficient online course materials.

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