Online learning satisfaction in higher education: what are the determining factors?

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ABSTRACT

The covid-19 pandemic crisis has triggered the implementation of comprehensive online learning in Indonesia, including in the higher education institutions. Changes in the conventional way of face-to-face learning to online one provides both positive and negative responses, which will affect student learning satisfaction. This research aims to determine student satisfaction with online learning, which is associated with perceived technological complexity, student learning experience, online learning readiness, and the presence of lecturers in online learning activities. This is research with a quantitative approach. Data was collected through a google online questionnaire distributed through a network of lecturers. The sample used is 439 students from state and private higher education institutions spread across eight islands in Indonesia. Statistical analysis uses the Structural Equation Model (SEM) in Stata 15. The results showed that online learning satisfaction was positively influenced by student experience, online learning readiness, and the presence of lecturers in online learning. Moreover, online learning readiness was found to be able to mediate student experience and online learning satisfaction but unable to mediate technology complexity and online learning satisfaction. These findings add to the literature on online learning satisfaction and provide direction for the solution of problems related to online learning satisfaction. The proposed suggestion to higher education institutions is to encourage the development of online-based collaborative models, to provide a continuous experience for students. The proposed suggestion to higher education institutions is to encourage the development of online-based collaborative models, to provide a continuous experience for students.

Keywords: online learning, learning satisfaction, learning readiness

INTRODUCTION

The Coronavirus disease of the 2019 pandemic, known to the public as the Covid-19, has shocked and even devastated all lines of human activity in the world, including in Indonesia. The Indonesian government issued a policy related to handling the Covid-19 pandemic which refers to the health protocol policy by the World Health Organization (WHO). In education, in an effort to keep the learning process going, the Ministry of Education of the Republic of Indonesia issued a policy on the Implementation of Education in the Emergency Spread of Coronavirus Disease (Covid-19). This policy regulates the changing pattern of teaching and learning activities in educational institutions from elementary schools to higher education, from conventional face-to-face meetings to long-distance meetings via the internet or online learning.

Online learning is defined as the use of technology and other intranet/internet-based tools and resources as a delivery method for structured learning activities, research, and communication (Means et al., 2010). Online learning is also known by several terms such as virtual learning, e-learning, and internet-enabled learning. The Pearson Survey states that up to 2019, the change in

the educational model to online learning in the eleven countries studied, has on average increased by 61% (Pearson, 2019). However, the model has not been done much in Indonesia. Some of the probable obstacles include problems in infrastructure, software availability, curriculum adjustments, skills and knowledge issues, and attitudes towards technology and communication (Kusumo et al., 2012).

In carrying out online learning, the level of student satisfaction must be considered so that its effectiveness can be seen. Likewise in higher education, the level of student satisfaction with online learning plays an important role in adopting online learning methods (Zhu, 2012). This high level of satisfaction will also have an impact on higher levels of learning (Fredericksen, 2000) so in the management of online learning, efforts to improve student satisfaction factors need to consider factors that contribute to student satisfaction, which can indicate the success of its application.

Al-Fraihat et al. (2017) said that one aspect that influences the successful implementation of online learning or e-learning is readiness, both infrastructure and technology, curriculum, and psychological readiness. Hung et al. (2010) also said that effective online learning can be achieved if students have online learning readiness. Knowing how online learning readiness the higher education main strategy can be to help students improve the effectiveness of their active learning and independence (Wei & Chou, 2020). Several studies have been conducted to examine online learning readiness and online satisfaction. Warner et al. (1998) stated that there are three aspects in student readiness to online learning, namely (1) online learning preferences to replace face-to-face classes; (2) students' self-confidence in electronic competence/internet skills, and (3) independent learning ability. Meanwhile Hung et al. (2010) states that there are five aspects used in measuring online learning readiness, namely self-directed learning, motivation for learning, computer/Internet self-efficacy, learner control, and online communication self-efficacy. The five aspects of readiness, self-efficacy on computer/network skills such as managing software, looking for online information, and performing basic software functions, is indispensable for the continuity of online learning.

In line with these findings, other research by Sahin & Shelley (2008) suggested that if students have the skills to use online tools and feel that online learning is useful, then those skills would promote their learning satisfaction. Skills in using technological devices will also affect student perceptions of the complexity of technology faced during online learning. The technology complexity that appears in online learning can involve hardware, software, and also the infrastructure used to support connectivity (Al-Araibi et al., 2019). Technological complexity was found to have a negative impact on constructs related to system acceptance (Hasan, 2007), where when the system has low complexity, the system is considered easy to use and useful (Teo, 2012), and signifies the success of the system (Parsazadeh et al., 2013). Ilgaz & Gülbahar (2015) also show that technology access competency and ICT competence are considered as individual characteristics that influence success net to learning experiences through interaction with lecturers and other participants to increase satisfaction. Technical difficulties in using this technology will later become one of the weaknesses in the implementation of online learning (Sitzmann et al., 2010). Because the technology aspect is one of the most important aspects of online learning, it is important to pay attention to the individual understanding of the complexity of technology to support readiness to take part in online learning.

In addition to technological complexity, Fogerson (2005) states that students' readiness is also related to their experiences, both collaborative environmental experiences and experiences following online learning. It is also said that the experience of following online learning can predict the level of trust in the online learning environment. Online learning experiences can affect the level of satisfaction, where a high level of satisfaction will lead to student involvement in online classes (Sahin & Shelley, 2008).

The involvement of students in online class activities cannot be separated from the role of the lecturer's presence. Lecturer presence is an important aspect when designing and facilitating online courses (Richardson et al., 2016), and has important implications for the overall learning experience of Bolliger & Martindale (2004). Lecturers must also build their presence and personality in-class activities during teaching and discussion (Shea et al., 2006), build communication strategies, build relationships with students, and build student involvement in learning (Richardson et al., 2016). The lectures' concern for learning by providing feedback is considered as high concern and it is felt as an important thing that significantly influences student satisfaction (Eom et al., 2006; Jaggars et al., 2013). Therefore, lack of interaction with lecturers and classmates' triggers dissatisfaction with online learning (Cole et al., 2014).

Although the findings of several studies state that student readiness is a significant predictor on measuring online learning satisfaction (Sahin & Shelley, 2008; Yilmaz, 2017), and different findings are stated by Fogerson (2005) that there is no significant relationship between readiness and online learning satisfaction factors. To fill this research gap, this research will explore student satisfaction with online learning experienced during the covid-19 pandemic. This research focused on the on-line learning at the higher educational institutions in Indonesia where such learning model has not been structurally implemented. The results of this research are expected to shed some lights on valuable information and help higher education to improve the implementation and management of online learning models in a sustainable manner. Higher education institutions, in Indonesia especially, can use the findings of this study to evaluate the application of online learning so that it can make improvements to the application of online learning.

METHOD

This research is a quantitative approach because the answers from respondents can be specified as a categorical number of the latent variables. To enable the responses be analyzed quantitatively, it is necessary to quantify the operational variables for these latent variables. The sample selection is done purposively or judgmental. Respondents in this study were students who took online learning during restrictions on studying on campus due to the Covid-19 pandemic. Students are considered more objective because they have better-thinking skills compared to those with lower levels of education (Guerra-Carrillo et al., 2017). To filter student respondents, questionnaires were distributed with the help of a network of lecturers where the lecturers could share questionnaire links directly to their students. In addition, each respondent is required to answer questions related to demographics such as educational strata, name of higher education, and study program or major. Furthermore, to find out the implementation of lectures, the questionnaire also asked "Are you taking online learning during the restrictions due to the Covid-19 pandemic?" "What application do you use to participate in online learning?" As a result, all respondents answered that they took online learning. The applications used to take online learning vary, such as using Google classroom, Google meet, Zoom, applications made by their own higher education institution itself, and other applications. All data that has been processed will be analyzed by using SEM because of its ability in analyzing the relationship among the latent variables.

The online questionnaire was used to collect data from respondents. The questionnaire in this research was designed as a closed and structured list of questions. Data was collected from university undergraduate students in Indonesia. A total of 448 questionnaires were received and 439 completed questionnaires (97.99%) were processed further. The questions in the questionnaire consisted of two groups, namely respondents' demographics, and those related to research variables. The demographic characteristics of the respondents include gender, age, education, ownership status of the higher education institutions, and the location/region when students participate in online learning. The research variables are; Technology Complexity (TC), Student Experience (SE. Online Learning Readiness (OR), Lecturer Presence (LP), and Online Learning Satisfaction (OS). Students come from 36 public and private tertiary institutions in Indonesia. Learning from home activities were recorded by students spread at 70 cities/districts in 8 islands in Indonesia. Respondents consist of: 41.91% men and 58.08% women. 19.36% people at the diploma level and 80.63% people at the bachelor or undergraduate level. The respondents' characteristics are presented in Table 1.

The processed data was then analyzed using descriptive analysis and SEM analysis through Stata 15 software. The descriptive analysis included the mean, standard deviation, and minimum-maximum value. The purpose of using descriptive analysis is to provide an overview of respondents' answers through the five variables studied. Meanwhile, SEM analysis was used to analyze the relationship between latent variables. The process of SEM analysis is carried out by determining the model specifications from the hypotheses of the relationship between variables, which is then continued with the overall suitability test of the model. From the results of the model

fit test, it will be known whether the model made is in accordance with the analysis generated by the statistical program.

Table 1. Respondent's demographi characteristics

Survey period	April – May 2020	N=439
Gender	Male	184
	Female	255
Age	Average	20 years old
	Youngest	17 years old
	Oldest	32 years old
Education	Associate Degree	85
	Bachelor Degree	354
Higher Education of Origin	State	15
	Private	21
The island where students live when studying online	Java	373
	Outside Jawa (Sumatra, Kalimantan, Sulawesi, Madura, Nusa Tenggara, Bali, Irian Jaya)	66

Note: Source Researcher's questionnaire (2020)

Good criteria for testing the overall fit of the model according to Hair et al. (2014) is to look at more than one statistic that is suitable for use by recommending one absolute index, one incremental index, and a minimum value of χ^2. Although there is no ground rule, reporting on multiple indices is necessary because different indices reflect different aspects of model fit. In this study, the absolute index is represented by the RMSEA value and the incremental index is represented by the CFI and TLI values.

Measurements

Some variables used in this research were developed and adapted from previous studies. Overall, there are 27 question items that are indicators of variable measurement, as can be seen in Table 2 below. The English questionnaire items from previous researchers have been translated into Bahasa Indonesia and adjusted so that they are easily understood by all respondents.

Measurement of Student Experience variable is developed based on the Fogerson's student experience scale (Fogerson, 2005). Student Experience (SE) is defined as the experience of students in an online collaborative environment and online learning. A 5-point likert scale with 1 = Never, and up to 5 = Very often, used to measure three items indicator. Examples of the question in this construct are "What is your experience with online collaborative environments such as e-mail, chat rooms, and/or discussions before having to take part in online learning during learning from home".

Variable Technology Complexity (TC) was developed from Attis (2014). Technology Complexity is defined as the level of difficulty and understanding of the technology used in online learning that is felt by students. A 5-point likert scale with 1 = Strongly Disagree until 5 = Strongly Agree is used to measure the four items indicator in this variable. Example of the question for Technology Complexity is a statement such as "be able to use online learning requires too much time to learn it".

Next, The Online Learning Readiness (OR) variable adopts 4 dimensions from Hung et al. (2010) presented in eleven indicator items. It includes Computer/Internet self-efficacy, Self-directed learning, Learner control, and Online communication self-efficacy. A 5-point likert scale with 1 = strongly disagree, and 5 = strongly agree, is used to measure each item of the four dimensions in this variable. Examples of question items in this construct are "I feel confident about asking questions and discussing them online".

Variable Lecturer Presence (LP) is defined as students' perceptions of the relationship that is built from the presence of lecturers in online learning activities. Consists of four indicator items and uses a new scale developed to measure lecturer perception based on the Gray and DiLoreto scale (Gray & DiLoreto, 2016). A 5-point likert scale with 1 = strongly disagree to 5 = strongly agree, is used to measure each item. Examples of a question in this construct is "Feedback on assignments delivered by lecturer clearly".

Table 2. Variables and item indicators

Variables	Item Indicators
Student Experience (SE)	- Online collaborating experience - Online learning experience - Hybrid learning experience
Technology Complexity (TC)	- Time to study online learning - The hassle of online learning - Online learning technical needs - Network disruption
Online Learning Readiness (OR)	- Knowledge and skills to manage computer devices/gadgets - Ability to use Internet search engines - Ability to carry out study plans - Initiatives to deal with learning problems - Ability to set study time - Ability to direct learning progress - Ability to manage other online activities - Repeating online course material - Confidently use online tools to communicate - Confident to express in the form of text or icons - Confident to ask/discuss online
Lecturer Presence (LP)	- Lecturers provide feedback - Lecturers pay attention to learning progress - The lecturers teach the material clearly - Lecturers invite students to be actively involved
Online Learning Satisfaction (OS)	- Satisfaction technical support during online learning - Satisfaction interacting with lecturers - Satisfaction interacting with friends (discussions, work assignments) - Interaction with online learning course material - Overall satisfaction

The Online Learning Satisfaction (OS) variable consists of five statements that were adopted from Fogerson (2005).. Online Learning Satisfaction is defined as the extent to which online learning experiences are felt to have fulfilled student expectations of the learning process and its' outcomes. A 5-point likert scale with 1 = strongly disagree to 5 = strongly agree is used to measure items in this variable. Example statement items is "I am satisfied with the technical support provided before and/or during online learning".

FINDING AND DISCUSSION

Finding

Descriptive statistics for each variable are presented in Table 3. Based on the Likert scale 1-5, it shows that the experience of Indonesian students in online collaborative learning and their ability to deal with technological complexity is still below average. Meanwhile, in online learning, readiness, lecturer perception, and online satisfaction, they have shown better scales.

From Table 3 above, it can be seen that the technological complexity faced by students is below the average value. This shows that most students do not experience the complexity of problems in using technology. As for the variables of learning experience, online learning readiness, readiness, lecturer perception, and online satisfaction, the scores are above average.

This shows that most students have sufficient learning experience, have good readiness to take part in online learning, have sufficient perception of the presence of lecturers during online learning, and are quite satisfied with the online learning they are participating in.

Table 3. Descriptive statistics of the variables

Variables	Obs.	Mean	Std.dev.	Min	Max
SE	439	2.831	.898	1	5
TC	439	2.344	.691	1	5
OR	439	3.705	.483	1	5
LP	439	3.434	.692	1	5
OS	439	3.340	.732	1	5

Note: SE: student experience; TC: technology complexity; OR: online readiness; LP: lecturer presence; OS: online learning satisfaction

The results of testing the validity and reliability of the instrument indicate that the instrument is valid and reliable. Instrument items are considered valid if the correlation coefficient value > 0.3 (Boateng et al., 2018) and the α value in the range 0.67 - 0.87 (Taber, 2018). The results of instrument validity and reliability are shown in Table 4. Furthermore, to deepen the analysis of the relationship between learning experience factors, online learning readiness, and the presence of lecturers, to online learning satisfaction, a model analysis was carried out using the Structural Equation Modeling (SEM) approach.

Table 4. Result of validity and reliability

Variables	Item	Item-test Correlation	α
SE	se1	.721	.697
	se2	.847	
	se3	.794	
TC	tc1	.749	.707
	tc2	.716	
	tc3	.795	
	tc4	.664	
OR	or1	.573	.837
	or2	.611	
	or3	.640	
	or4	.518	
	or5	.659	
	or6	.705	
	or7	.612	
	or8	.592	
	or9	.709	
	or10	.624	
	or11	.657	
LP	lp1	.830	.847
	lp2	.801	
	lp3	.863	
	lp4	.816	
OS	os1	.790	.859
	os2	.871	
	os3	.806	
	os4	.754	
	os5	.792	

Note: SE: student experience; TC: technology complexity; OR: online readiness; LP: lecturer presence; OS: online learning satisfaction, n=439

Goodness of fit model

The SEM analysis process is carried out by determining the structural model specifications from the hypothesis of the relationship between variables. The structural model of this research shown in Figure 1.
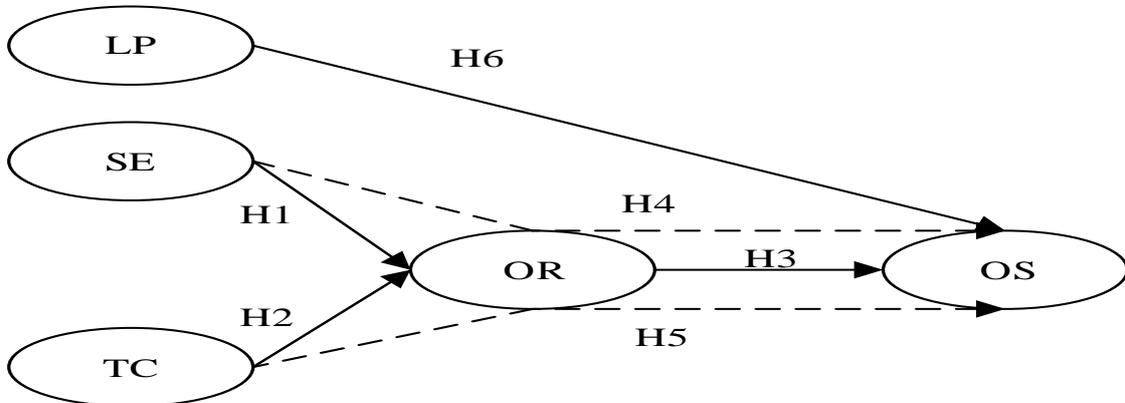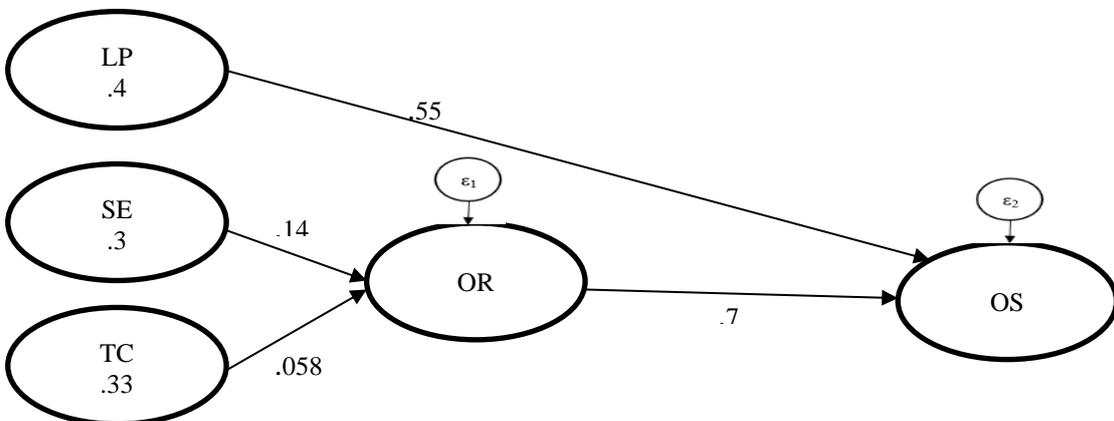

Figure 1. Structural Model

After estimating the model, then proceed with the overall fit test of the model. The results of the overall fit of the model are shown in Table 5.

Table 5. Goodness of fit indeces for the model

Fit Indices	Recomended Value	Indices Value
Chi-square/(df)	≤ 3.00	1058.180
RMSEA	< .08	.072
CFI	.80 - .90	.838
TLI	.80 - .90	.822

The Result of the Goodness of Fit Model in Table 5 shows that although the value of χ^2 is high, the other three indices are still within a good range of values. Index value of RMSEA index met the criteria since it's value is .072 which is less than the recommended value of .08, representing a good fit model. The CFI and TLI indices have also shown that they meet the criteria of an adequate measurement model with a marginal fit value. This is based on the previous literature which states that the marginal fit value is still acceptable (Hair et al., 2014). Therefore, it could be concluded that in the measurement model, the data adequately fit the SEM model in this research.

Figure 2 shows the results of SEM structural model estimation. The results would indicate whether the proposed hypothesis is supported or rejected.

Figure 2 Results of Structural Model Estimation

Table 6. Structural model estimation

Variable	Loading Factor	Z value	P>|z|
SE - OR	.201	3.430**	.000
TC – OR	.853	1.461	.144
OR - OS	.661	10.659**	.000
LP - OS	.525	15.276**	.000

Notes: The table presents unstandardized regression coefficients and standardize errors for each measure. N=439

From structural model estimation, Table 6 shows the result of hypothesis estimate. The first hypothesis in this research estimates the associative relationship between variable SE on OR. The statistical results indicates that the SE has a significant association on OR, thus H_1 is supported. The second hypothesis expects the association between TC and OR. However, the results show that TC does not have a significant associative effect on OR, therefore H_2 is rejected.

In this research, the third hypothesis is the associative relationship between OR with OS. The test results indicate that the hypothesis that OR has a significant relationship with OS is also supported, therefore H_3 is accepted. Furthermore, the fourth hypothesis stated that OR acted as mediator between SE and OS. Similarly, the fifth hypothesis stated that OR also behave as mediator between TC and OS. The result of statistical test indicated that OR significantly serve as a mediating variable between SE and OS. However, it cannot mediated the association between TC and OS. Thus, H_4 is accepted and H_5 is rejected.

The sixth hypothesis suggests that LP has associative relationship with OS. The results show that LP has statistically proved a significant effect on the OS variable. Thus H_6 is not rejected. The results of structural model tests also indicates that the contribution of the SE to the changes in OR is 4%, the contribution of the LP to the OS is 36%, and the contribution of the SE to the OS is 25%.

Previous statistical testing on structural model indicates that OR is able to mediate SE and OS, but not able to mediate TC and OS. Table 7 below shows the direct and indirect relationship of the variables SE, TC and OR to OS and variabel LP to OS.

Table 7. Direct - Indirect Effect

Variabel	Direct Effect	Indirect Effect	Total Effect
SE – OR	.143	-	.143
SE – OS	-	.098	.098
TC – OR	.058	-	.058
TC – OS	-	.040	.040
OR – OS	.697	-	.697
LP – OS	.542	-	.542

Note: SE: student experience; TC: technology complexity; OR: online readiness; LP: lecturer presence; OS: online learning satisfaction

Discussion

This research aims to determine student satisfaction with online learning which is associated with perceived technology complexity, student learning experiences, readiness for online learning, and student perceptions of the presence of lecturers in online learning activities. Online learning that has been carried out in Indonesia as a whole during the Covid-19 pandemic is a major change in the method of learning in schools. This online learning model may not end after the pandemic but will be sustainable in the future as a new model of education in Indonesia. Therefore, it is necessary to know about the satisfaction felt by students and what things contribute to that satisfaction.

In the student experience construct, on average, students in Indonesia have sufficient experience in participating in online learning. As many as 40.1% of students stated that they had participated in online learning several times. The large number of students who have experience participating in online learning can occur because most of the students who are respondents live on the island of Java. Java Island is the island that has the highest internet penetration rate in

Indonesia, namely 55.7%, followed by Sumatra with 21.6%, and three other areas, namely Kalimantan 5.2%, Sulawesi 6.6%, and Irian Jaya 10.9% (APJII, 2018). This ease of internet access allows them to be able to interact and collaborate in online learning, both formally in lecture classes at colleges and taking online classes outside of college.

In the construction of technology complexity, on average, students do not experience complex problems related to the use of technology to participate in online learning. The problem that is considered sufficient to affect the implementation of online learning is network stability. This is in accordance with the results of a survey conducted by the Ministry of telecommunication that although internet networks are available in most areas in Indonesia, network stability is still a problem (Kominfo RI, 2020). Students also quite agree that participating in online learning requires time to learn. In the implementation of online lectures, it was stated by students that lecturers can use learning applications provided and made by their higher education institutions or use applications provided by developers such as through Googlemeet, Zoom, Edmodo, Microsoft Teams, Google Classroom, Ed-link. In addition, to support certain courses, sometimes lecturers also use other applications that must be connected to a laptop or mobile phone as their learning device. Even though it doesn't have a high level of complexity, this requires them to first learn how to use the application in order to be able to take part in online learning well.

In the online-learning readiness construct, on average, students have readiness to participate in online learning. They have the confidence to communicate or discuss through online tools, have sufficient knowledge and expertise to manage their college devices such as laptops and mobile phones, have good skills in using search engines. His ability to use search engines helps students to learn independently when rereading material that has been distributed by the lecturer. In addition, they also use their abilities to seek help when facing learning problems.

Although accustomed to using technology, Students really expect the presence of lecturers, not only teach but also guide students to complete assignments, provide feedback, and even listen to (Richardson et al., 2016; Vesely et al., 2007). In the lecturer attendance construct, students agree that the lecturer's ability to make the class more active is very much needed. This is because during the period of restrictions on community movement, students have never met their classmates and teaching lecturers. Therefore, interaction can be created if the lecturer is able to invite all students to be actively involved in the learning process. In addition, students also agreed that giving the material clearly and also feedback on assignments will help them absorb the lesson better.

The findings of this research show that the experience of students who have participated in online learning before has an influence on their readiness to take online lectures during the pandemic. Students who already have student experience in collaborative online and online learning environments make them more confident. Students are able to discuss, express their feelings in the form of text, and make them able to direct their own learning progress. This helps their readiness to take online lectures continuously during mobility restrictions during the pandemic. These results are in line with Fogerson (2005) and Warrican et al. (2014) who stated that experience is one of the factors that influence online learning readiness. The results of this experience also confirm what has been conveyed by Warner et al. (1998) that students' readiness for online learning requires students' confidence in electronic competence/internet skills, and independent learning abilities.

Regarding the complexity of technology, the findings of this research indicate that the readiness of students to take part in online learning is not influenced by the complexity of the technology they face. This finding supports what was conveyed by Kusumo et al. (2012). that students do not experience problems with their knowledge of technology. In general, students in this research were able to learn the use of online learning technology because it did not have a high complexity so that it did not take long to learn. The students in this research were on average 20 years old, and were classified as generation Z, namely individuals born in 1996 - 2012 (Schwieger & Ladwig, 2018). Generation Z is considered to have more ability to adapt in the use of digital technology. In particular, it was also conveyed that Generation Z in Asia has excellent capabilities in terms of the use of cellular technology, has unlimited access to various information through various digital channels (Parry, 2020). This ability helps them in learning the technology

used in online learning. On the other hand, the government's policy to provide online education during the pandemic is recognized by students as an unavoidable condition. Under limited conditions, all higher education institutions must move quickly to prepare for the needs of technology used in online learning and ensure technical assistance to overcome problems in online learning. Therefore, although the implementation of online learning is sudden, students do not feel a problem in the technology they use and are still ready to take part in online learning.

The results of this research also found that online learning readiness and the presence of lecturers had a significant positive effect on student satisfaction. This shows that the higher the level of readiness of students in participating in online learning, the greater their satisfaction in participating in online learning. Likewise, if students feel the presence of a high lecturer in the class, their satisfaction will also increase. In general, students view themselves as ready to participate in online learning, especially because they have skills in managing computer equipment, have initiative in overcoming learning problems, and have the confidence to communicate, discuss and express opinions online.

The findings regarding the effect of online learning readiness on online learning satisfaction are different from the results presented by Fogerson (2005). This difference is possible because the respondents in previous studies used students from various strata, from undergraduate to graduate students with an older average age of 35 years. Meanwhile, this research focuses on undergraduate students where most of them are Generation Z. Age has the potential to cause differences in results because individuals with a more mature age have different learning styles such as preferring to learn through video rather than more interactive learning (Simonds & Brock, 2014).

After years of face-to-face learning, changing to online learning is not an easy thing. The change in learning to online learning brings a sense of loss in the presence of friends and teachers, loss of atmosphere, and reduced understanding of the material (Khalid & Quick, 2016). The lack of interaction as in face-to-face lectures often makes students feel bored and makes learning less effective (Irawan et al., 2020). The existence of interaction, feedback from lecturers and attention to student progress, the provision of clear lecture materials, and the ability of lecturers to make students active during learning, can increase student satisfaction in participating in online learning. Meanwhile, the lack of teacher guidance and interaction in the online learning environment can be a big problem (Zhu, 2012). In addition, to take part in online learning, confidence in communicating becomes the basis for interacting with friends and lecturers. The interaction construction both interactions with lecturers, fellow students, and the material being taught plays an important role for satisfaction in face-to-face learning and online learning (Kuo et al., 2014). The results of this research support the results of previous studies where the presence of lecturers and the confidence to interact in an online environment can increase student satisfaction in participating in online learning (Khalid & Quick, 2016; Tan et al., 2017).

This model conveys the value of online learning experiences to support student readiness to attend lectures. Students who are ready and the presence of lecturers is felt to affect their satisfaction in participating in online learning. The findings regarding the absence of the influence of technological complexity on online learning readiness provide clues for the sustainability of the online learning model. The online learning method allows it to be continued because technology has become a part of today's student life. They no longer experience significant difficulties in operating the technology used in online learning. In addition, through online learning, it allows students to independently explore their techniques and thinking (Wang et al., 2019). However, the availability of a stable network is needed to support online learning. The implication of this research is that student satisfaction in attending online lectures can be further improved by prioritizing the readiness and presence of lecturers in online learning. Optimizing the readiness and presence of lecturers is needed to increase students' independence in learning and their involvement in the two-way learning process. The existence of a good online learning system will increase learning readiness and encourage collaboration and interaction so that learning satisfaction increases and can boost academic achievement.

CONCLUSION

This research seeks to explore the factors that influence student satisfaction in Indonesia in participating in online learning. Research using a cross sectional design found that student satisfaction with online learning is influenced by student experience, online learning readiness, and lecturer presence factors. The online learning readiness factor was found to be able to mediate the student experience and online learning satisfaction. However, the online learning readiness factor is not able to mediate the technological complexity of online learning satisfaction. Related to online learning readiness and online learning satisfaction factors, the finding of this research is different from previous finding by Fogerson (2005). It could be caused by differences in generations where students in this research were classified as Generation Z. They have fairly good abilities in using digital technology, which has now become part of students' daily lives. These findings imply that the importance of the role of higher education institutions in preparing and promoting the development of online-based collaborative learning models. They need to provide a sustainable experience for students. In addition, higher education institutions can increase the knowledge and skills of lecturers through trainings to improve their ability to manage classes to be more interactive, both materially and socially. Support for a good and structured online learning system is needed to encourage readiness and collaboration. Considering the online learning system allows it to continue in higher education, further research can develop this research model with academic achievement and characteristics between generations of learning actors.

REFERENCES

Al-Araibi, A. A. M., Mahrin, M. N. bin, & Yusoff, R. C. M. (2019). Technological aspect factors of e-learning readiness in higher education institutions: Delphi technique. *Education and Information Technologies*, 24(1), 567–590. https://doi.org/10.1007/s10639-018-9780-9.

Al-Fraihat, D., Joy, M., & Sinclair, J. (2017). Identifying success factors for e-learning in higher education. *12th International Conference on E-Learning* (ICEL 2017), April 2020, 247–255.

APJII. (2018). *Survei Penetrasi dan Profil Perilaku Pengguna Internet Indonesia 2018*. https://apjii.or.id/survei

Attis, J. (2014). An investigation of the variable that predict teacher e-learning acceptance. In Liberti University. Liberty University.

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer. *Frontiers in Public Health*, 6(June), 1–18. https://doi.org/10.3389/fpubh.2018.00149

Bolliger, D. U., & Martindale, T. (2004). Key factors for determining student satisfaction in online courses. *International Journal on E-Learning*, January-Ma, 61–67. https://www.learntechlib.org/primary/p/2226/.

Cole, M. T., Shelley, D. J., & Swartz, L. B. (2014). Online instruction, e-learning, and student satisfaction: A three-year study. *International Review of Research in Open and Distance Learning*, 15(6), 111–131. https://doi.org/10.19173/irrodl.v15i6.1748.

Eom, S. B., Ashill, N., & Wen, H. J. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education*, 4(2), 215–235. https://doi.org/https://doi.org/10.1111/j.1540-4609.2006.00114.x

Fogerson, D. L. (2005). Readiness factors Contributing to participant satisfcction in online higher education courses [University of Tennessee - Knoxville]. https://trace.tennessee.edu/utk_graddiss/1952.

Gray, J. A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *NCPEA International Journal of Educational Leadership Preparation*, 11(1), 98–119.

Guerra-Carrillo, B., Katovich, K., & Bunge, S. A. (2017). Does higher education hone cognitive

functioning and learning efficacy? Findings from a large and diverse sample. *PLoS ONE*, 12(8), 1–17. https://doi.org/10.1371/journal.pone.0182276

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson Education.

Hasan, B. (2007). Examining the effects of computer self-efficacy and system complexity on the path of paths of the technology acceptance. *Information Resources Management Journal*, 20(3), 76–88. https://doi.org/10.4018/irmj.2007070106

Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers and Education*, 55(3), 1080–1090. https://doi.org/10.1016/j.compedu.2010.05.004.

Ilgaz, H., & Gülbahar, Y. (2015). A snapshot of online learners: E-readiness, e-satisfaction and expectations. *International Review of Research in Open and Distance Learning*, 16(2), 171–187. https://doi.org/10.19173/irrodl.v16i2.2117.

Irawan, A. W., Dwisona, & Lestari, M. (2020). Psychological Impacts of Students on Online Learning During the Pandemic COVID-19. *KONSELI: Jurnal Bimbingan Dan Konseling*, 7(1), 53–60. https://doi.org/10.24042/kons.v7i1.6389

Jaggars, S. S., Edgecombe, N., & Stacey, G. W. (2013). *Creating an effective online instructor presence*. http://files.eric.ed.gov/fulltext/ED542146.pdf.

Khalid, M., & Quick, D. (2016). Teaching Presence Influencing Online Students' Course *Satisfaction at an Institution of Higher Education. International Education* Studies, 9(3). https://doi.org/10.5539/ies.v9n3p62

Kominfo RI. (2020). *Status Digital Literasi Indonesia. Direktorat Jenderal Aplikasi Informatika*. https://aptika.kominfo.go.id/wp-content/uploads/2020/11/Survei-Literasi-Digital-Indonesia-2020.pdf

Kuo, Y. C., Walker, A. E., Schroder, K. E. E., & Belland, B. R. (2014). Interaction, internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *Internet and Higher Education*, 20, 35–50. https://doi.org/10.1016/j.iheduc.2013.10.001.

Kusumo, N. S. A. M., Kurniawan, F. B., & Putri, N. I. (2012). *Elearning obstacle faced by Indonesian students.* The Eight Conference on ELearning for Knowledge-Based Society, February 23–24. http://www.elearningap.com/eLAP2011/Proceedings/paper25.pdf.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies*. US Department of Education. www.ed.gov/about/offices/list/opepd/ppss/reports.html.

Parry, E. (2020). *Generation Z in Asia: Patterns and Predictions*. In E. Gentina & E. Parry (Eds.), The New Generation Z in Asia: Dynamics, Differences, Digitalisation (pp. 195–200). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80043-220-820201021

Parsazadeh, N., Megat, N., Zainuddin, M., Ali, R., & Hematian, A. (2013). A review on the success factors of e-learning. *The Second International Conference on E-Technologies and Networks for Development* (ICeND2013), August 2018.

Pearson. (2019). The global learner survey. https://www.pearson.com/content/dam/global-store/global/resources/Pearson_Global_Learner_Survey_2019.pdf.

Richardson, J. C., Besser, E., Koehler, A., Lim, J. E., & Strait, M. (2016). Instructors' perceptions of instructor presence in online learning environments. *International Review of Research in Open and Distance Learning*, *17*(4), 82–104. https://doi.org/10.19173/irrodl.v17i4.2330.

Sahin, I., & Shelley, M. (2008). Considering students' perceptions: The distance education student satisfaction model. *Educational Technology and Society*, *11*(3), 216–223. https://www.j-ets.net/collection/published-issues/11_3.

Schwieger, D., & Ladwig, C. (2018). Reaching and Retaining the Next Generation: Adapting to the Expectations of Gen Z in the Classroom. *Information Systems Education Journal*, *16*(3), 45–54.

Shea, P., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *Internet and Higher*

Education, *9*(3), 175–190. https://doi.org/10.1016/j.iheduc.2006.06.005.

Simonds, T. A., & Brock, B. L. (2014). Relationship Between Age, Experience, and Student Preference for Types of Learning Activities in Online Courses. *Journal of Educators Online*, *11*(1). https://doi.org/10.9743/JEO.2014.1.3

Sitzmann, T., Ely, K., Bell, B. S., & Bauer, K. N. (2010). The effects of technical difficulties on learning and attrition during online training. *Journal of Experimental Psychology: Applied*, *16*(3), 281–292. https://doi.org/10.1037/a0019968.

Taber, K. S. (2018). The use of cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, *48*(6), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2.

Tan, S., Chuah, F., & Ting, H. (2017). Empowering 21st Century Learners Through Holistic and Enterprising Learning. *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, 3–10. https://doi.org/10.1007/978-981-10-4241-6

Teo, T. (2012). Modelling the influences of beliefs on preservice teachers' attitudes towards computer use. *European Journal of Educational Research*, *1*(1), 13–22. https://doi.org/10.12973/eu-jer.1.1.13.

Vesely, P., Bloom, L., & Sherlock, J. (2007). Key elements of building online community: Comparing faculty and student perceptions. *Journal of Online Learning and Teaching*, *3*(3). https://jolt.merlot.org/vol3no3/vesely.pdf

Wang, H., Pi, Z., & Hu, W. (2019). The instructor's gaze guidance in video lectures improves learning. *Journal of Computer Assisted Learning*, *35*(1), 42–50.

Warner, D., Christie, G., & Choy, S. (1998). The readiness of the VET sector for flexible delivery including on-line learning: a guide for developers of curriculum and training packages.

Warrican, S. J., Leacock, C. J., Thompson, B. P., & Alleyne, M. L. (2014). Predictors of student success in an online learning environment in the English-speaking caribbean: Evidence from the university of the west Indies open Campus. *Open Praxis*, *6*(4). https://doi.org/10.5944/openpraxis.6.4.158.

Wei, H. C., & Chou, C. (2020). Online learning performance and satisfaction: do perceptions and readiness matter? *Distance Education*, *41*(1), 48–69. https://doi.org/10.1080/01587919.2020.1724768.

Yilmaz, R. (2017). Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classroom. *Computers in Human Behavior*, *70*, 251–260. https://doi.org/10.1016/j.chb.2016.12.085.

Zhu, C. (2012). Student satisfaction, performance, and knowledge construction in online collaborative learning. *Journal of Educational Technology & Society*, *15*(1). http://www.jstor.org/stable/jeductechsoci.15.1.127.