

# The Evaluation of Learning Management System (LMS) Canvas amidst Pandemic: Students' Perspectives

Faradillah Haryani, Budi Poniam

Sampoerna University

[faradillah.haryani@sampoernauniversity.ac.id](mailto:faradillah.haryani@sampoernauniversity.ac.id)

**Abstract.** Due to the spread of the Covid-19 virus, the Pandemic Era shifted face-to-face learning to online distance learning, which faced many challenges. One of the challenges is the decreasing level of student motivation and interactivity. LMS to organize learning materials, assignments, and other learning activities is an alternative that facilitates the learning process during the pandemic. Through LMS, lecturers can share materials, give assignments, and provide feedback to students through an integrated online system. This research aims to examine the effectiveness of using LMS Canvas at Sampoerna University, especially pedagogic quality during the pandemic. In this study, researchers used a questionnaire adapted from the LMS Evaluation model by Mtebe & Raisamo (2014) by adding pedagogical quality, including teaching quality, interactivity quality, and student understanding quality. The results of the study state that these three components have a positive effect on user satisfaction and the use of LMS.

**Keywords:** Canvas, LMS Evaluation, Model of LMS Evaluation, Quality of Instruction, Quality of Interactivity

## INTRODUCTION

The spread of the covid-19 virus has made governments around the world enforce social distancing. This policy resulted in the learning process initially carried out face-to-face into distance learning (Arto, 2020). The transformation from face-to-face to distance learning mode was carried out simultaneously without any integrated preparation, especially in mastering technology (Al Lily, Ismail, Abunasser, & Alqahtani, 2020).

In its implementation, distance learning reveals various problems, one of which is the lack of interactivity in learning, which results in a decreasing academic ability (Onyema, Sen, & Alsayed, 2020). During the pandemic, teachers and lecturers were observed more often giving assignments without explaining or discussing the presented material (Arsendy, Sukoco, & Purba, 2020). This fact caused the level of stress experienced by students to increase during the pandemic. In addition, many gaps occurred, especially in internet accessibility and supporting devices (Arsendy, Sukoco, & Purba, 2020), resulting in only a few students attending virtual classes. Therefore, we need an integrated system to organize learning activities so that teachers and students can know what activities will be carried out and access them regardless of the time and the place.

The Learning Management System (LMS) is a solution to manage all interactions in learning using technology within the platform (Munir, 2010). Thus, the use of LMS during the pandemic has increased along with the need for online learning (Edtech World Bank, 2020). However, LMS functions solely to upload and share materials without support from other activities that reinforce the students' and lecturers' interactivity (Hasan, 2019). Moreover, the LMS evaluation process mainly refers to the Mtebe and Raisamo Evaluation Model (Mtebe & Raisamo, 2014), where

pedagogic elements in the quality of interactivity, instruction, and students' understanding are not yet measured in the model.

We conducted this research in one of the universities in Indonesia that are accustomed to using technology in their learning, including technology that supports face-to-face learning and online learning. The face-to-face interaction process, supported by easy access to materials and the assessment result integrated within the LMS, has become a common practice at this university. However, as all universities are in a pandemic period, interactivity becomes a challenge in learning. Through this study, researchers then evaluate the use of Canvas LMS during the pandemic by developing the current LMS evaluation model by Mtebe and Raisamo. We add pedagogic elements, including the quality of interactivity, quality of instruction, and students' understanding of the presented material. In addition, researchers will further propose a new LMS evaluation model accordingly.

## **METHOD**

This research aims to evaluate the use of Canvas LMS in a private university and propose the new model of evaluation of LMS accordingly. Therefore, a questionnaire was developed by adopting the current model of LMS evaluation from Mtebe and Raisamo (2014) and adding three components: quality of interaction, quality of instruction, and quality of understanding. The questionnaire was checked for its validity and reliability using SPSS. In addition to that, there are hypotheses developed to construct a new proposed model of LMS evaluation.

Generally, we adopted the same hypothesis from the current model (Mtebe & Raisamo, 2014), yet we added the new hypothesis for the newly added component. All hypotheses will be tested for their correlation and regression in SPSS (See Table 1).

**Table 1. Hypothesis for Constructing Model of LMS Evaluation**

<b>No.</b>	<b>Component</b>	<b>Hypothesis</b>
1.	System Quality	System quality positively affects users' satisfaction
2.		System quality positively affects LMS use.
3.	Course Quality	Course quality affects users' satisfaction
4.		Course quality affects LMS use.
5.	Quality of Interaction	Quality of interaction affects users' satisfaction
6.		Quality of interaction affects LMS use.
7.	Quality of instruction	Quality of instruction affects users' satisfaction
8.		Quality of instruction affects LMS use
9.		Quality of instruction affects the quality of understanding.
10.	Quality of Understanding	Quality of understanding affects users' satisfaction
11.		Quality of understanding affects LMS use
12.		Quality of interaction affects the quality of understanding.
13.	Combined	User Satisfaction affects LMS use
14.		LMS Use affects Perceived Net Benefit

This research was carried out for two semesters starting in January 2021 and implemented at one private university where the research participants were students who took the courses in Spring 2020-2021. There were 98 courses taught at that period, with 1032 students administered to the courses. Due to the concise timeline, we chose ten courses to be the sample, as research found that the sample size should be at least 10% of the population (Hashim, 2010). To capture the proper representation of Canvas LMS use, we also used the students' satisfaction survey data at the end of the semester that the university had categorized. We chose ten samples from four faculties, as shown in Table 2.

**Table 2. Distribution of Research Participants**

Course	Score Range	Faculty	Number of Students
Course A	High	FoE	3
Course B	High	GenEd	5
Course C	High	FET	4
Course D	High	FET	10
Course E	Middle	FoB	19
Course F	Middle	FoB	5
Course G	Low	FoE	12
Course H	Low	FET	10
Course I	Low	Sex	35
Course J	Low	FET	6
Total			109

Notes: FoE = Faculty of Education; FET = Faculty of Engineering and Technology; FoB = Faculty of Business; GenEd = General Education

We distributed the questionnaire with the help of the academic registry to ensure that everyone administered in the course mentioned in Table 2 filled the questionnaire. There are two types of data in the questionnaire (see the following link: <https://bit.ly/LMSQuestionnaire>). We obtained the first data from a 5-Likert scale questionnaire. At the same time, we got the second data from the open-ended questions. The first data were categorized to see the effectiveness of LMS Canvas implementation, while the data from open-ended questions were coded and then generalized in specific themes. Those two data were analyzed descriptively. The first data were also used for hypotheses testing to see the structure of the proposed model of LMS evaluation.

## FINDINGS

### The Validity of Instrument

The validity of an instrument determines how accurate our instrument is in measuring things according to our research objectives. There are two types of validity: content validity and construct validity. For this instrument, two educational technology experts have checked the content validity of the questionnaire. It showed that the instrument was valid with minor revisions in the grammar. After going through the content validity testing, the researcher then tested the construct validity using the validity test in SPSS with the corrected item-total correlation. According to Widiyanto (2010), items in an instrument are declared valid if the corrected item value-total correlation ( $r_{\text{count}} > r_{\text{table}}$ ). Before conducting the validity test in SPSS, the researcher then calculated the  $r_{\text{count}}$

table value based on the 5% significance level (Alpha) and the number of respondents (n). The r-table value for the 5% significance level and  $n-2 = 109 - 2 = 107$  is 0.188. The validity test results showed that every item in the questionnaire is valid as all of them have r-count more than the r-table for  $\alpha = 5\%$  (See Appendix A).

### The Reliability of Instrument

In addition to testing the validity of the SPSS, the researcher also tested the reliability of the instrument used. Reliability informs the consistency of the results provided by the instrument when tested in the same setting with the same type of subject (Sullivan, 2011). In short, reliability tells us the consistency of the instrument. We reported the reliability by finding the internal consistency reliability seen from Cronbach's alpha value. According to Widiyanto (2010), an instrument is reliable if the value of the Cronbach alpha coefficient is more than 0.6. In addition, the Cronbach alpha also affects the reliability testing. The questionnaire is declared reliable if the Cronbach alpha value is greater than the r table. On the other hand, if the Cronbach alpha value is smaller than the r table, the questionnaire is declared unreliable.

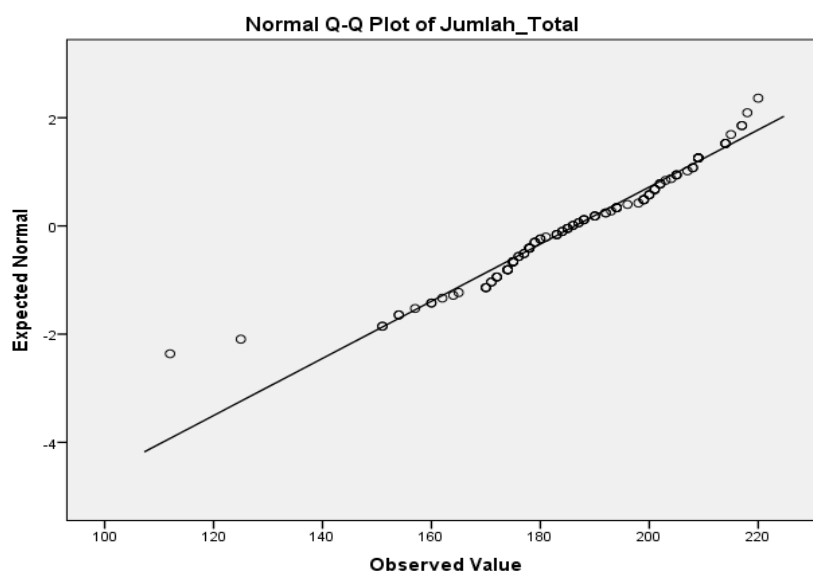
**Table 3. Reliability Results Using SPSS**

Cronbach's Alpha	N of Items
0,771	49

According to Table 3, the value of Cronbach's Alpha is greater than the value of the r-table (0.188). This result concludes that all items in the questionnaire are also reliable.

### Data Normality

There are two procedures conducted to test the normality of the data distribution in this research. We tested the normality of data distribution with Kolmogorov Smirnov as recommended for a sample size of more than 50 (Mishra et al., 2019). The researcher used graphical procedures by showing the Q-Q plot and supported the quantitative procedure using Kolmogorov-Smirnov. The result of the normality test using the graphical procedure is shown in Figure 1.



**Figure 1. Q-Q Plot for Normality Test**

**Table 4. Kolmogorov-Smirnov Result for Normality Test**

Kolmogorov-Smirnova		
Statistic	df	Sig.
0,084	109	0,058

Table 4 states that the significance value = 0.058 > 0.05. It means that the data is normally distributed. It is also supported by Figure 1, where most data is close to the normal line.

### Questionnaire Result

We used descriptive analysis to describe how effective Canvas LMS was from the students' perspectives. Therefore, to understand the range of the effectiveness, we categorized the responses to several criteria from 'not effective' to 'very effective.' In doing that, we used the following formula (Umar, 2013) to determine the scale range for results categorization:

$$R_k = \frac{n(m - 1)}{m}$$

\*  $R_k$  = scale range;  $n$  = sample size;  $m$  = number of options in questionnaire

There are 109 respondents to the 5-Likert scale questionnaire. Therefore, the scale range is

$$R_k = \frac{109(5 - 1)}{5} = 87$$

Then the categorizations are described in Table 5.

**Table 5. Students' Questionnaire Response Categorization**

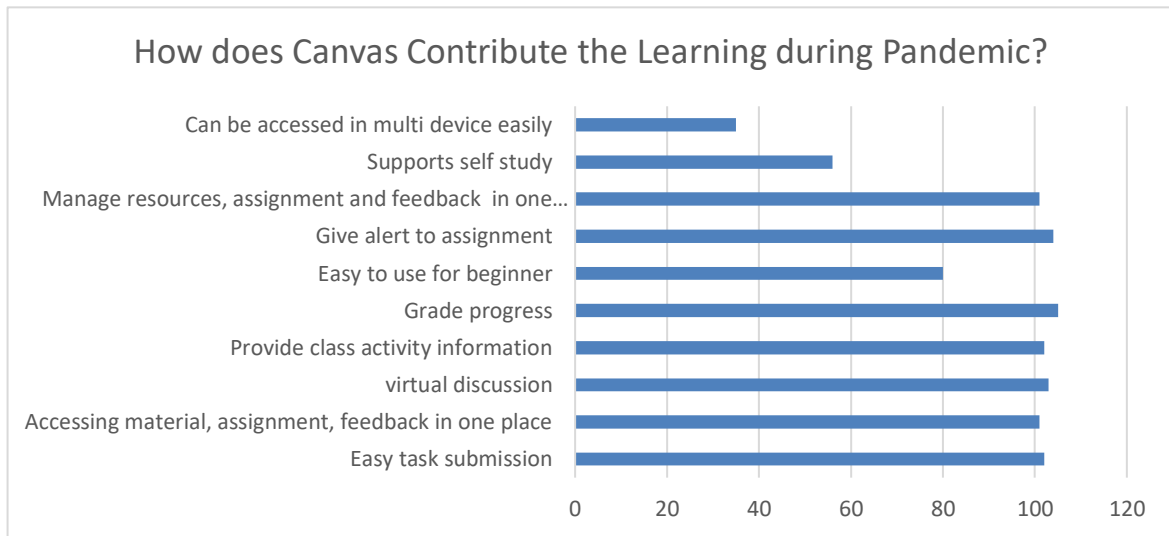
Total Score	Criteria	Result
109-196	Strongly Disagree	Not effective
197-284	Disagree	Less effective
285-372	Not Applied/Never use or experience it	Quite effective
373-460	Agree	Effective
461-548	Strongly Agree	Very effective

After the categorization, we found that all components of Canvas LMS had been conducted either effectively or very effectively.

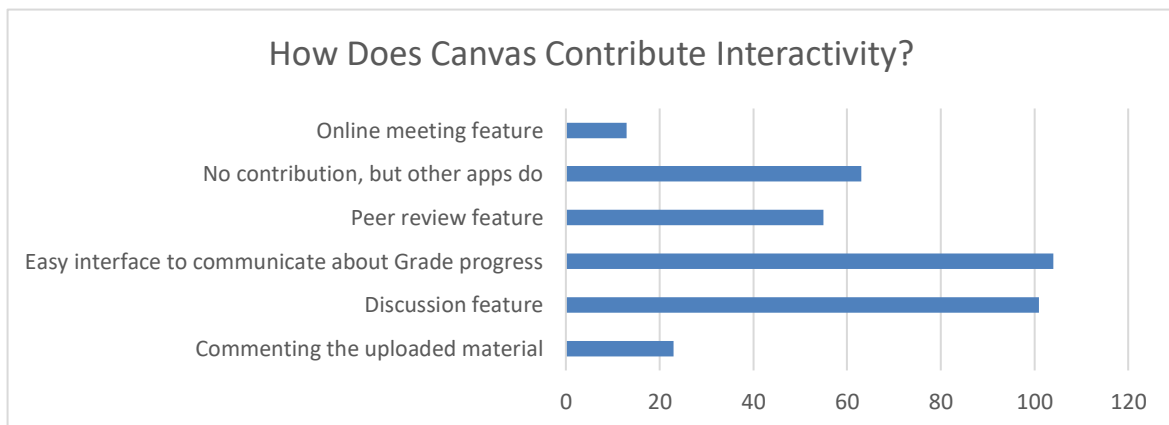
**Table 6. Summary of categorization of questionnaire result**

Component	Average of Total Score	Result
System Quality	451	Effective
Course Quality	468	Very Effective
User Satisfaction	469	Very Effective
LMS Use	470	Very Effective
Perceived Net Benefits	463	Very Effective
Quality of Instruction	455	Effective
Quality of Interaction	432	Effective
Quality of Understanding	477	Very Effective

Furthermore, there are two open-ended questions added to the questionnaire. Those two questions ask about how Canvas contributes the interactivity. The results are coded and generalized into several themes, as depicted in the following chart in Figure 2 and Figure 3.



**Figure 2. Canvas Contribution to the Learning during Pandemic**



**Figure 3. How Does Canvas Contribute Interactivity**

The components with the lowest score are system quality, quality of interaction, and quality of instruction (See Table 4). They have been categorized into practical implementation. However, there are some arguments that students disagree with.

For the system quality, there is one statement that students do not agree with (41% said not applied/ Never use it; 16% Disagree, 1% strongly disagree) (See Appendix B). This statement mentions the help features in Canvas. It shows that students mostly do not know about the help feature and do not refer to it whenever they get lost in Canvas.

For the quality of interaction, students agree that Canvas can engage students in active learning (statement number 3). However, they also agree that other platforms need to be embedded in Canvas to maintain interactivity (statement number 4). The coded open-ended question responses also support it. 58% (n=63) students say that Canvas does not contribute a lot in the interactivity component, but other embedded platforms do (See Figure 3). One of the respondents said:

"It only lets us access assignments and materials. For interactive activities, we mostly do it with other embedded applications in Canvas."

Some students agree that Canvas can provide engagement and interactivity as long as the lecturer embed or integrate other platform or websites in the Canvas course. Finally, for the quality of instruction, some students do not agree with the statement about the given feedback from the lecturer (19% said not applied/never experienced it; 20% disagree; 3% strongly disagree).

### Hypothesis testing

To develop the new model in evaluating Canvas which incorporates the quality of interaction, instruction, and understanding, the researcher did the hypotheses testing to see the structure of the model. We did regression analysis and correlation tests in SPSS. The result is depicted in Table 7.

**Table 7. Summary of Hypothesis Testing in SPSS**

No.	Hypothesis	Result	Conclusion
1.	System quality positively affects users' satisfaction.	Correlation = 0,491 Sig. 0,000 R <sup>2</sup> =0,241=24% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. System quality = 0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =24% shows that system quality affects users' satisfaction for 24%. (Supported)
2.	System quality affects LMS use.	Correlation = 0,528 Sig. 0,000 R <sup>2</sup> =0,279=28% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. System quality =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =28% shows that system quality affects user LMS use for 28%. (Supported)
3.	Course quality affects users' satisfaction.	Correlation = 0,679 Sig. 0,000 R <sup>2</sup> =0,461=46% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. Course quality =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =46% shows that course quality affects users' satisfaction for 46%. (Supported)
4.	Course quality affects LMS use.	Correlation = 0,737 Sig. 0,000 R <sup>2</sup> =0,544=54% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. Course quality =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =54% shows that system quality affects users' satisfaction for 54%. (Supported)
5.	Quality of interaction affects users' satisfaction.	Correlation = 0,598 Sig. 0,000 R <sup>2</sup> =0,357 =36% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. quality of interaction =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =36% shows that quality of interaction affects users' satisfaction for 36%. (Supported)
6.	Quality of interaction affects LMS use.	Correlation = 0,658 Sig. 0,000 R <sup>2</sup> =0,433=43% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. quality of interaction = 0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =43% shows that quality of interaction affects LMS use for 43%. (Supported)

No.	Hypothesis	Result	Conclusion
7.	Quality of instruction affects users' satisfaction.	Correlation = 0,671 Sig. 0,000 R <sup>2</sup> =0,451 =45% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. quality of instruction =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =45% shows that quality of instruction affects users' satisfaction for 45%. (Supported)
8.	Quality of instruction affects LMS use.	Correlation = 0,763 Sig. 0,000 R <sup>2</sup> =0,582 =58% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. quality of instruction =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =58% shows that quality of instruction affects LMS use for 58%. (Supported)
9.	Quality of understanding affects users' satisfaction.	Correlation = 0,614 Sig. 0,000 R <sup>2</sup> =0,377=38% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. quality of understanding =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =45% shows that quality of instruction affects users' satisfaction for 38%. (Supported)
10.	Quality of understanding affects LMS use.	Correlation = 0,688 Sig. 0,000 R <sup>2</sup> =0,474=47% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. quality of understanding =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =47% shows that quality of understanding affects LMS use for 47%. (Supported)
11.	Quality of interaction affects Quality of understanding	Correlation = 0,507 (Tabel Model Summary dan Correlation) Sig. 0,000 R <sup>2</sup> =0,257=26% Sig. 0,000 (Anova Table) Sig. constanta = 0,000 Sig. quality of interaction =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =26% shows that quality of interaction affects quality of understanding for 26%. (Supported)
11.	Quality of instruction affects Quality of understanding	Correlation = 0,689 Sig. 0,000 R <sup>2</sup> =0,474=47% Sig. 0,000 (Anova Table) Sig. constanta = 0,001 Sig. quality of instruction =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =47% shows that quality of instruction affects quality of understanding for 47%. (Supported)
13.	Users' satisfaction affects LMS use.	Correlation = 0,940 Sig. 0,000 R <sup>2</sup> =0,884=88% Sig. 0,000 (Anova Table) Sig. constanta = 0,00 Sig. User satisfaction =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =88% shows that users' satisfaction affects LMS use for 88%. (Supported)
14.	LMS use affects Perceived Net Benefit	Correlation = 0,717 Sig. 0,000 R <sup>2</sup> =0,514=51% Sig. 0,000 (Anova Table) Sig. constanta = 0,022 Sig. LMS use =0,00 (Coefficient Table)	It has a strong positive correlation. R <sup>2</sup> =51% shows that quality of interaction affects the quality of understanding for 51%. (Supported)



Therefore, the proposed model for evaluating Canvas LMS is depicted in Figure 4.

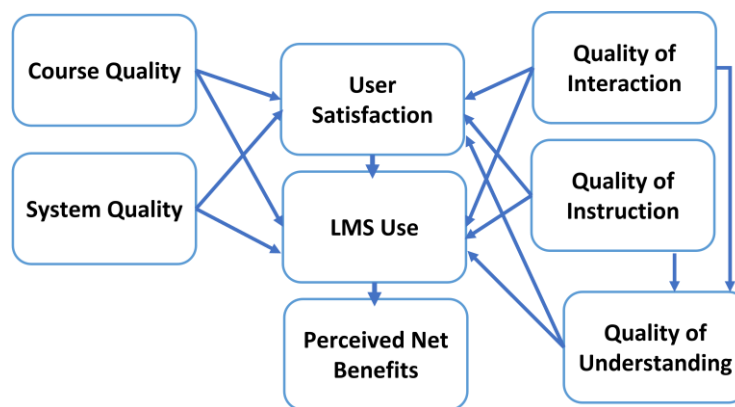


Figure 4. The Final Model of LMS Canvas Evaluation

## DISCUSSION

This research aims to evaluate the use of Canvas LMS in the university during the pandemic. In addition to that, this research also has the objective to propose a revised model of LMS evaluation developed before by Mtebe & Raisamo (2014) by including quality that needs more concern in the pandemic era. Due to the covid-19 pandemic, there are alternatives for a face-to-face meeting to continue the learning process; one of them is providing a learning management system for the universities that do not have one (Google, Temasek, & Bain, 2020). Using a learning management system (LMS) in the learning process aids e-learning by providing instructional materials without considering the time or location, allowing students and teachers to communicate through the internet, and facilitating the exchange of course-related information and resources (Raza, Qazi, Khan, & Salam, 2021). This fact suits the pandemic condition where students and lecturers can only communicate virtually. However, during the implementation of online learning in the pandemic era, some problems emerged, such as communication problems (Mahyoob, 2020), pedagogical problems mainly related to the interactivity in the class, and technological problems (Ferri, Grifoni, & Guzzo, 2020). It is then suggested to evaluate LMS use and propose a new model for LMS evaluation during the pandemic.

The findings show that Canvas LMS use in this university has been either 'effective' or 'very effective.' There are only three criteria categorized as effective: system quality, quality of interaction, and quality of instruction. We added three criteria to the newly developed evaluation model to see how the quality of interaction, instruction quality, and understanding quality integrated into Canvas, especially during a pandemic. Those criteria are three components that still lack in the online learning implementation during the pandemic. Surprisingly, two of the three new criteria have the lowest score in the questionnaire result (See Table 6).

### Quality of Interaction

In online learning, one of the present issues is the issue of the low level of interactivity. This problem also occurs in the academic environment of universities, where students feel that the level of interactivity in learning during a pandemic is shallow (Marzuki, 2020). Interactivity is an activity that allows interaction between students and students-lecturers during the learning process, increasing participation and understanding (Nugent et al., 2020). So, in other words, interactivity and

understanding have a positive correlation. Many technologies have supported this in building interactions in online learning, including LMS as a strategy to build an interaction where students can communicate about the assignments and get feedback (Hasan, 2019).

The current report about educational technology usage in Southeast Asian countries mentioned a need to increase the adoption of online learning besides video uploading tools (Google et al., 2020). In addition to that, the use of LMS should not be limited to only accessing the material but also providing a virtual interaction by using the available feature. Canvas provides the feature of interactivity; one of them is a discussion tool. Moreover, other research states that students who spend their time in accessing the relevant actions, not only accessing the material but also interacting with peers in the discussion tool on LMS, most likely have a higher grade (Cerezo, Sánchez-Santillán, Paule-Ruiz, & Núñez, 2016). This statement justifies that interactivity plays a vital role in academic achievement.

There are three types of interactivity for LMS use Lecturer-Students, Students-Students, and Students-Content (Santy, Kurniali, & Indrajani, 2018). Moreover, the following table has summarized the type of interactivity. It also shows the example of activity based on the responses from the open-ended question in the questionnaire.

**Table 8. Interactivity Type in LMS Canvas**

Type	Example of Activity
Lecturer - Students	Discussion via online meeting Discussing the grade progress via speed grader
Students - Students	Discussion with peers via Discussion Tool Peer Review via Discussion Tool
Students - Content	Commenting on the uploaded material via studio Online quizzes via quiz or studio Exploring materials via the embedded platform

The other research stated that Canvas has several features to support the interactivity feature (Baldwin & Ching, 2019). This research justifies the open-ended questions result shown in **table 8**. These features are the students' interaction supported by discussion and collaborative project features; students-lecturers interactions supported by the feedback and comments features on submissions; and students' interaction with the content provided through the page feature where lecturers can create interactive instructions or materials.

The highlighted issue from the quality of interactivity component in this research is that the lecturers need to embed other platforms and websites to keep the interactivity. More than 50% of respondents state that Canvas does not have the feature of interactivity. However, others say that they have explored the feature of Canvas that supports interactivity. Therefore, we conclude that some lecturers have used the Canvas feature to support interactivity; others may not know about the feature. This fact justifies that the interactive content in educational technology tools is still less used in Southeast Asian Countries (Google et al., 2020). However, this research should continue to survey what features the lecturers frequently use regarding interactivity. This result will inform the university stakeholder to provide workshops to highlight the less-used feature.

### Quality of Instruction

Pandemic changes the way lecturers give instruction, from face-to-face to online. There are two types of activities in Online learning: Asynchronous session, where we conduct teaching processes

using prepared material that has been uploaded before with the instruction, or synchronous (live session), where the lecturer directly delivers the instruction. The research found that students feel more relaxed in the asynchronous session as it will depend on their own pace to learn about the material (Nurwahyuni, 2020). The written instruction plays an essential role as the written instruction substitutes the instruction in a face-to-face meeting during online learning in the pandemic era. The questionnaire results show that the lecturer successfully gives explicit instructions using the Canvas feature (50% strongly agree, 47% agree, 1% neutral, 1% disagree). However, feedback quality needs to be improved. Quality instruction also needs to include quality and effective feedback that provides information about their learning progress to catch up with the learning process (Heinze & Reiss, 2016). To provide clear and high-quality feedback, the lecturer may provide the feedback via the speed grader feature in multiple forms of media, such as audio, video, link to particular websites, or pictures.

### **The New Proposed Model for Evaluation of LMS**

The current model for evaluating LMS (Mtebe & Raisamo, 2014) did not include the pedagogical quality, such as quality of instruction, interactivity, and understanding. Therefore, this research proposes a new model where we included those three components. We see from Table 7 that those three components supported both LMS use and users' satisfaction components. Quality of instruction affects the LMS use significantly by 58%, more than any other components. It then suggests comprehensive instruction that includes explicit instructions and prompt feedback to guide students on what to do next (Heinze & Reiss, 2016). In addition to that, quality of instruction and interaction positively affect the quality of understanding. According to a study conducted by (Koh & Kan, 2020), students who frequently used LMS required valuable instructional activities to obtain positive learning outcomes. Therefore, we as lecturers should provide more comprehensive instructions and add more interactivity components in our class activity organized within LMS. We also need to consider the lecturers' perspectives to give insight into the LMS evaluation. LMS is also encouraged to solve interactivity and instruction problems during the online learning implementation in the pandemic era. Finally, this research should be conducted with a more significant number of students.

### **CONCLUSION**

This research aims to evaluate the effectiveness of Canvas LMS in one of the universities in Indonesia. The student questionnaire is developed according to the current LMS evaluation model by Mtebe and Raisamo (2014), yet we add the pedagogical components such as interactivity, interaction, and students' understanding. The researcher decided to add those three components as those still lack in the implementation of online learning during the pandemic. The findings stated that those three components positively affect user satisfaction and LMS use. The quality of instruction components has the most influence on LMS use for about 58%. It implies that lecturers should concern more about the quality of instruction in LMS. Clear instructions should accompany every activity uploaded to the LMS.

Moreover, lecturers also need to provide comprehensive feedback to support the instruction. Finally, this research then suggests the newly developed model of LMS evaluation, which includes those three components mentioned before. However, to bring more insight to the LMS Evaluation, further research should be conducted in a larger environment and look at the lecturer's perspectives.

## REFERENCE

- Al Lily, A. E., Ismail, A. F., Abunasser, F. M., & Alqahtani, R. H. A. (2020). Distance education as a response to pandemics: Coronavirus and Arab culture. *Technology in Society*, *63*, 101317. <https://doi.org/10.1016/j.techsoc.2020.101317>
- Arsendy, S., Sukoco, G. A., & Purba, R. E. (2020). Riset dampak COVID-19: potret gap akses online 'Belajar dari Rumah'dari 4 provinsi. *INOVASI*. Retrieved from <https://theconversation.com/riset-dampak-covid-19-potret-gap-akses-online-belajar-dari-rumah-dari-4-provinsi-136534>
- Arto, R. B. (2020, May 21). *Transforming Indonesia's education through online learning*. Retrieved from <https://www.thejakartapost.com/academia/2020/05/21/transforming-indonesias-education-through-online-learning.html>
- Baldwin, S. J., & Ching, Y. (2019). *International Review of Research in Open and Distributed Learning A Review of the Canvas Course Evaluation Checklist Online Course Design : A Review of the Canvas Course Evaluation Checklist*.
- Cerezo, R., Sánchez-Santillán, M., Paule-Ruiz, M. P., & Núñez, J. C. (2016). Students' LMS interaction patterns and their relationship with achievement: A case study in higher education. *Computers and Education*, *96*, 42–54. <https://doi.org/10.1016/j.compedu.2016.02.006>
- Edtech World Bank. (2020). *4. Edtech in Indonesia – Ready for Take-Off?* (May).
- Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. *Societies*, *10*(4), 86. <https://doi.org/10.3390/soc10040086>
- Google, Temasek, & Bain & Company. (2020). *Resilient and racing ahead: Southeast Asia at full velocity*. <https://www.bain.com/insights/e-economy-sea-2020/>
- Hasan, L. (2019). Investigating Students' Perceptions of Moodle LMS In Terms of Its Features and Usability. *International Arab Journal of E-Technology*, *5*(3), 110–122. Retrieved from <http://rcm-library.rcm.upr.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edspub&bquery=ZT+%26quot%3Bjournal%26quot%3B&type=44&site=eds-live>
- Hashim, Y. (2010). Determining sufficiency of sample size in management survey research activities. *International Journal of Organisational Management and Entrepreneurship Development*, *6*, 119–130.
- Heinze, A & Reiss, K. (2016). Developing Argumentation and Proof Competencies in the Mathematics Classroom, Teaching and Learning Proof Across The Grades: A K-16 Perspective. *Journal of Education and Practice*, *7*(16), 38–41.
- Koh, J. H. L., & Kan, R. Y. P. (2020). Perceptions of learning management system quality, satisfaction, and usage: Differences among students of the arts. *Australasian Journal of Educational Technology*, *36*(3), 26–40. <https://doi.org/10.14742/AJET.5187>
- Mahyoob, M. (2020). Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners. *Arab World English Journal*, *11*(4), 351–362. <https://doi.org/10.24093/awej/vol11no4.23>

- Marzuki, M. B. (2020, April 16). Survei IPNU Jatim: Mayoritas Pelajar Ingin Metode Belajar Daring Kreatif. *Jatim Times.Com*. Retrieved from <https://www.nu.or.id/post/read/119135/survei-ipnu-jatim--mayoritas-pelajar-ingin-metode-belajar-daring-kreatif>
- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia*, 22(1), 67–72. [https://doi.org/10.4103/aca.ACA\\_157\\_18](https://doi.org/10.4103/aca.ACA_157_18)
- Mtebe, J. S., & Raisamo, R. (2014). A model for assessing learning management system success in higher education in sub-Saharan Countries. *Electronic Journal of Information Systems in Developing Countries*, 61(1), 1–17. <https://doi.org/10.1002/j.1681-4835.2014.tb00436.x>
- Munir, M. (2010). Penggunaan Learning Management System (Lms) Di Perguruan Tinggi: Studi Kasus Di Universitas Pendidikan Indonesia. *Jurnal Cakrawala Pendidikan*, 1(1), 109–119. <https://doi.org/10.21831/cp.v1i1.222>
- Nugent, A., Lodge, J., Carroll, A., Bagraith, R., MacMahon, S., Matthews, K. E., & Sah, P. (2020). Higher education learning framework: an evidence-informed model for university learning. In *Higher education learning framework: an evidence-informed model for university learning*. <https://doi.org/10.14264/348c85f>
- Nurwahyuni, R. (2020). An Analysis of Students' Perception on Synchronous and Asynchronous Learning in Speaking Skill During Pandemic Covid-19. *Inacelt*, 4432(October), 21–22.
- Onyema, E. M., Sen, S., & Alsayed, A. O. (2020). Impact of Coronavirus Pandemic on Education. *Journal of Education and Practice*, (May). <https://doi.org/10.7176/jep/11-13-12>
- Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2021). Social Isolation and Acceptance of the Learning Management System (LMS) in the time of COVID-19 Pandemic: An Expansion of the UTAUT Model. *Journal of Educational Computing Research*, 59(2), 183–208. <https://doi.org/10.1177/0735633120960421>
- Santy, Kurniali, S. & Indrajani. (2018). Interaction and Learning Model in E-Learning. *Journal of Theoretical and Applied Information Technology*, 96(14), 4541–4547.
- Sullivan, G. M. (2011). A Primer on the Validity of Assessment Instruments. *Journal of Graduate Medical Education*, 3(2), 119–120. <https://doi.org/10.4300/jgme-d-11-00075.1>
- Umar, H. (2013). Metode penelitian untuk skripsi dan tesis. *Jakarta: Rajawali*, 42.
- Widiyanto, J. (2010). SPSS For Windows untuk analisis data statistik dan penelitian. *Surakarta: BP-FKIP UMS*.

**APPENDIX A**

**The Results of Validity Test**

Criteria	Item	R- Count	R- Table ( $\alpha = 5\%$ )	Remarks
System Quality	X1	0.202	0.198	Valid
	X2	0.367	0.198	Valid
	X3	0.477	0.198	Valid
	X4	0.311	0.198	Valid
	X5	0.365	0.198	Valid
	X6	0.55	0.198	Valid
	X7	0.451	0.198	Valid
Course Quality	Y1	0.594	0.198	Valid
	Y2	0.634	0.198	Valid
	Y3	0.694	0.198	Valid
	Y4	0.608	0.198	Valid
	Y5	0.546	0.198	Valid
	Y6	0.668	0.198	Valid
	Y7	0.719	0.198	Valid
	Y8	0.61	0.198	Valid
	Y9	0.725	0.198	Valid
	Y10	0.616	0.198	Valid
User Satisfaction	Z1	0.722	0.198	Valid
	Z2	0.613	0.198	Valid
	Z3	0.783	0.198	Valid
	Z4	0.415	0.198	Valid
LMS Use	P1	0.658	0.198	Valid
	P2	0.491	0.198	Valid
	P3	0.669	0.198	Valid
	P4	0.747	0.198	Valid
	P5	0.595	0.198	Valid
Perceived Net Benefits	Q1	0.688	0.198	Valid
	Q2	0.629	0.198	Valid
	Q3	0.708	0.198	Valid
	Q4	0.488	0.198	Valid
Quality of Instruction	R1	0.668	0.198	Valid
	R2	0.616	0.198	Valid
	S1	0.722	0.198	Valid
	S2	0.613	0.198	Valid
Quality of Interaction	S3	0.783	0.198	Valid
	S4	0.415	0.198	Valid
	T1	0.535	0.198	Valid
	T2	0.521	0.198	Valid
	T3	0.453	0.198	Valid
	T4	0.525	0.198	Valid
	T5	0.292	0.198	Valid
	T6	0.62	0.198	Valid

Criteria	Item	R- Count	R- Table ( $\alpha = 5\%$ )	Remarks
	T7	0.52	0.198	Valid
	T8	0.791	0.198	Valid
Quality of Understanding	U1	0.705	0.198	Valid
	U2	0.76	0.198	Valid
	U3	0.634	0.198	Valid
	U4	0.262	0.198	Valid

**APPENDIX B**

**Percentage and Total of Score of Students' Questionnaire**

No	Component	Item	Total	Persentase					Total Score	Result
				Strongly Agree	Agree	Not Applied/ Never Use or Experience it	Disagree	Strongly Disagree		
1.	System Quality	1	109	78%	17%	0%	0%	6%	503	Very effective
		2	109	51%	44%	1%	1%	3%	480	Very effective
		3	109	22%	61%	6%	6%	6%	423	Effective
		4	109	23%	46%	11%	16%	5%	400	Effective
		5	109	16%	36%	41%	6%	1%	391	Effective
		6	109	50%	45%	1%	1%	3%	479	Very effective
		7	109	50%	46%	1%	1%	2%	482	Very effective
2.	Course Quality	1	109	57%	42%	1%	0%	0%	497	Very effective
		2	109	39%	55%	2%	5%	0%	466	Very effective
		3	109	44%	54%	0%	0%	2%	478	Very effective
		4	109	38%	56%	4%	3%	0%	467	Very effective
		5	109	37%	56%	3%	5%	0%	463	Very effective
		6	109	39%	51%	5%	3%	2%	462	Very effective
		7	109	39%	51%	6%	3%	1%	464	Very effective
		8	109	43%	56%	0%	1%	0%	481	Very effective
		9	109	38%	46%	8%	6%	3%	447	Effective
		10	109	32%	57%	11%	0%	0%	459	Effective
3.	User Satisfaction	1	109	57%	42%	1%	0%	0%	497	Very effective
		2	109	39%	55%	2%	5%	0%	466	Very effective
		3	111	44%	54%	2%	0%	2%	484	Very effective
		4	109	38%	56%	4%	3%	0%	467	Very effective
		5	109	37%	56%	3%	5%	0%	463	Very effective
		6	109	39%	51%	5%	3%	2%	462	Very effective
		7	109	39%	51%	6%	3%	1%	464	Very effective
		8	109	43%	56%	0%	1%	0%	481	Very effective
		9	109	38%	46%	8%	6%	3%	447	Effective
		10	109	32%	57%	11%	0%	0%	459	Effective
4.	LMS Use	1	109	27%	58%	9%	6%	1%	440	Effective
		2	109	72%	28%	0%	0%	0%	515	Very effective
		3	109	66%	34%	0%	0%	0%	508	Very effective
		4	109	56%	38%	5%	2%	0%	488	Very effective
		5	109	40%	44%	2%	13%	1%	447	Effective
		6	109	60%	40%	0%	0%	0%	501	Very effective
		7	109	21%	43%	23%	9%	4%	402	Effective
		8	109	34%	54%	10%	2%	0%	458	Effective
5.	Perceived Net Benefit	1	109	44%	52%	3%	1%	0%	479	Very effective



No	Component	Item	Total	Persentase					Total Score	Result
				Strongly Agree	Agree	Not Applied/ Never Use or Experience it	Disagree	Strongly Disagree		
		2	109	38%	50%	9%	2%	1%	460	Effective
		3	109	50%	46%	1%	3%	0%	484	Very effective
		4	109	20%	57%	21%	1%	1%	430	Effective
6.	Quality of Instruction	1	109	50%	47%	2%	1%	0%	487	Very effective
		2	109	21%	49%	19%	9%	2%	412	Effective
		3	109	41%	57%	1%	1%	0%	478	Very effective
		4	109	40%	54%	4%	2%	0%	472	Very effective
		5	109	27%	50%	14%	8%	1%	429	Effective
7.	Quality of Interaction	1	109	27%	52%	17%	2%	3%	434	effective
		2	109	27%	52%	12%	7%	2%	430	effective
		3	109	25%	51%	15%	8%	1%	426	effective
		4	109	27%	56%	12%	5%	1%	439	effective
8.	Quality of Understanding	1	109	41%	57%	2%	0%	0%	479	Very effective
		2	109	40%	56%	4%	0%	0%	476	Very effective