Lecturer Readiness Analysis of Online Learning at Mulawarman University in the Covid-19 Era

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Abstract— The Covid-19 pandemic currently has been raving human life. Teaching methods in higher education have shifted towards online learning. This study aims to measure the readiness of the Mulawarman University lecturer in the implementation of fully online learning during the pandemic. Data was collected for 4 weeks through the electronic questionnaire, visualization, and analysis with Electronic Learning Readiness (ELR) Aydin Tasci score. The ELR score of 3.610 shows that lecturers from this campus are ready for the implementation of online learning. However, the scores on this level still require little treatment that can improve lecturers' readiness, especially on factors that are still under standards such as perception and constraints on technological operability.

Keywords—Covid-19 Pandemic, ELR Score, Online Learning, Mulawarman University

I. INTRODUCTION

The Covid-19 pandemic currently has been raving human life. All aspects of human life are affected, including education and teaching. Schools, campuses, and educational institutions have been closed since the first positive confirmation cases in Indonesia in March 2020[1][2]. This situation forced the lecturer to adapt to teaching online. But this is not easy, some issues arise when there are lecturers who feel they are not ready to implement learning online.

The implementation of online learning is not all a technological issue. The provision and use of online learning systems are not necessarily able to solve the problem of learning in the era of Covid-19. Many factors influence the successful application of online learning in a higher education institution. The successful implementation of the E-Learning system relies heavily on the understanding of actors involved directly with the adoption factor of online-learning systems[3][4].

The online learning method at Mulawarman University, Samarinda Indonesia has been adapted by several lecturers in the faculty. This educational institution has developed its learning management system named Mulawarman Online Learning System at URL: www.mols.unmul.ac.id[5]. Under normal circumstances before the Covid-19 pandemic, disruption of this method is not so encouraging. Mols app users grow up not so significant. Lecturers are still reluctant to implement an online learning system and prefer face-to-face learning.

This research aims to explore the factors that affect the level of readiness of Mulawarman University in the implementation of the online learning system in the Covid-19 pandemic. The results are expected to provide policy recommendations to the leadership of Mulawarman University to determine the right strategy to improve the quality of online teaching in the Covid-19 pandemic.

II. RELATED STUDY

Reference studies are conducted on this research to enrich knowledge and scientific studies. Pandemic Covid-19 has inspired many world researchers to see its influence on the field of education. This virus has changed the human life side, including the education field. It requires adaptation and readiness of all elements to deal with the teaching period in the next semester. Online learning is an effective solution to enable classrooms even if the school has been closed due to the time and place at risk during this pandemic. However, these learning techniques are important to evaluate according to local conditions that are given the distribution of facilities, tools, and infrastructure[1].

Success in the implementation of online lectures on an educational institution relies heavily on the level of readiness of the elements involved. The low level of student readiness in implementing online learning cannot achieve optimal benefits and can impact financial losses. Therefore, it is important to measure the level of student readiness to avoid the impact of the failure of e-Learning implementation. In the study, researchers used the Akaslan & Low and Aydin & Tasci models to measure the level of student readiness for online learning activities[6].

Research has been conducted to measure the level of lecturer readiness in electronic learning due to pandemic Covid-19 in Indonesia. The lecturers have been trying various platforms for online learning according to their levels of understanding. This research shows that demographic factors do not affect the level of technology readiness of the lecturers. The finding confirms that the sudden change due to COVID-19 causes polarization of technological segmentation[7].

Some research has investigated many of the advantages and disadvantages of online learning. The perceived influence of the 4.0 industrial Revolution enters the world of higher education. Disruption and paradigm change learning has been felt since it entered the 20th century[8]. Online learning has some advantages over conventional learning, among others: Being able to reach long-distance students, extensive access capabilities, and not limited by location and time. Thus there is no strong evidence that conventional learning is better than online learning[9][10][11].

III. MATERIALS AND METHODS

A. Materials

Data has been collected through electronic surveys using a questionnaire designed using form.office.com[12]. Data collection techniques using Stratified Random Sampling. The analysis method using Descriptive Statistics and Quantitative Analysis with the Electronic Learning Readiness (ELR) Score with Aydin Tasci Model. The questionnaire was distributed to prospective respondents for 4 weeks, from 5 to 31 July 2020. During this period, it has accumulated data from student layers and lecturer layers. But for this study, only data from lecturers were analyzed. The step-by-step work on this research is explained in the following figure.
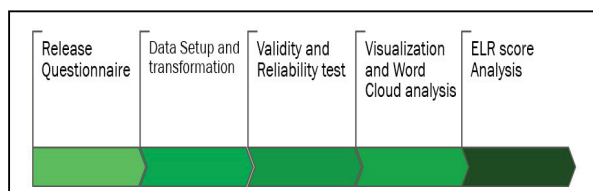

Fig. 1. Five stages of activity in this study

The study worked on transforming data from the 0-10 scale value on the questionnaire converted to the Likert 1-5 scale. On a positive question, the value from low to high means from strongly disagreeing to very agree. As for the negative questions such as constraints, then the meaning is reversed from strongly agree to very disagree. In the process of data preparation and transformation used Microsoft Excel spreadsheet software[13].

B. Variable observations

The study implemented 4 variables for the measurement of ELR levels, namely the skill of using e-learning technology (V1) with 3 questions, the perception of benefits and quality assurance of online learning (V2) with 2 questions, policies and ICT support on online learning (V3) with 2 questions, and constraints on online learning (V4) with 4 questions.

C. Validity and Reliability Test

Studies that implement surveys with the instrument of the questionnaire, must conduct a test of the validity and reliability of the questionnaire. The validity test is obtaining the suitability of the questions with the intended purpose of each variable. The reliability test is to measure the consistency of the question of each variable if the questionnaire is used repeatedly to measure the respondent[6]. The validity test uses the value of the Pearson correlation coefficient, measuring the significance of each question's correlation with the total value of the questions in

the same variable. The reliability test is measured using Cronbach's Alpha value with a limit of 3.6. This test used IBM SPSS Statistics Subscriptions software and analyzed all questions on each variable[14]. If the resulting Cronbach's Alpha is greater than 0.6 then the question in the variable is reliable.

D. ELR Score Analysis

The Electronic Learning Readiness (ELR) score was measured using a model developed by Aydin & Tasci[15]. The Aydin Tasci Model divides the readiness of 4-stage online learning implementation. This model is based on the Likert scale score measured by the questionnaire on each respondent. Then calculated the average value of Aydin Tasci all questions each variable and compared it to its default value. If the obtained value is greater than 3.4 then an institution is ready but needs improvement[6]. The standard value of the ELR scores Aydin Tasci described in Fig. 2.
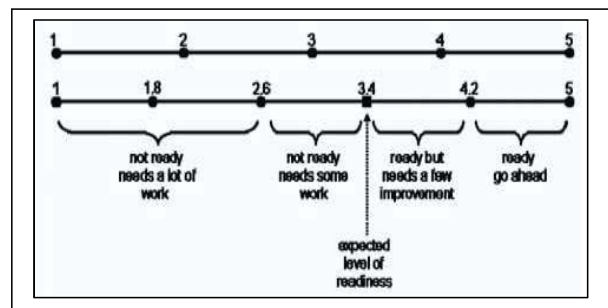
Fig. 2. The standard value of the ELR score Aydin Tasci

IV. RESULT AND DISCUSSION

A. Data Visualization

In this research, the lecturer has collected 123 respondents. After the data has been previously prepared and transformed into a Likert scale, data explorations are performed using Microsoft Power BI[16]. Fig. 3 explains the number of lecturer respondents when asked about the availability of hardware devices such as Personal Computer, Laptop, Tablet, Pad, or other online learning support tools. Data shows that lecturers have the establishment of such hardware ownership.
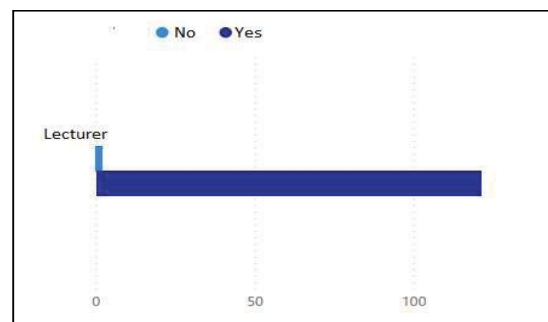
Fig. 3. Percentage of hardware ownership, there are still 1.6% of lecturers have no supporting hardware

The next question is still related to infrastructure readiness. Besides readiness to hardware ownership, lecturers are also asked about the existence of the internet network in the location they work. The result still has 6.5% out of 123 respondent's difficulties in teaching online because there is no internet connection (Fig. 4). That's because online learning models are based on the existence of internet network infrastructure. The location with internet conditions is less stable, it becomes a major constraint for lecturers to do online teaching.
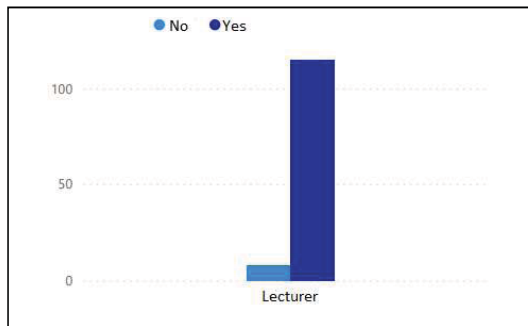
Fig. 4. Percentage of Internet access support, there are still 8 lecturers who have no internet access at the location they teach

Although the existence of hardware infrastructure and internet networks is quite well established among lecturers, data still shows that their perception of online learning effectiveness is still relatively low. It is because there are still many lecturers who think that online learning with information technology feels less effective compared to conventional learning. Fig. 5 reveals evidence that still around 40% of the University of Mulawarman lecturer who assumed that online learning is ineffective. This is a false assumption because there is much research that proves that online learning with information technology has many advantages over conventional learning[11][9][10].
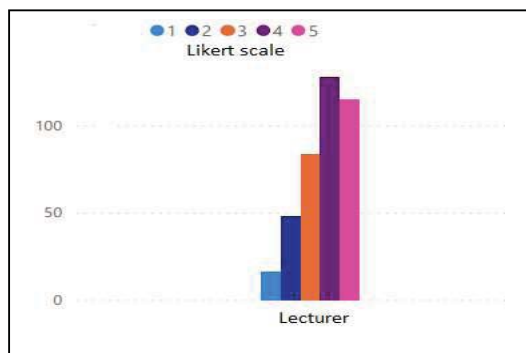
Fig. 5. Percentage graphs of respondents ' perception of online learning effectiveness

The same situation when lecturers were asked about the quality assurance of online learning. Only 36.79% of respondents who answered the quality of online learning is high. The rest answer is moderate or low (Fig. 6). This shows that lecturers ' level of confidence in the quality of online learning is still low. This is what causes them still reluctant to apply it.
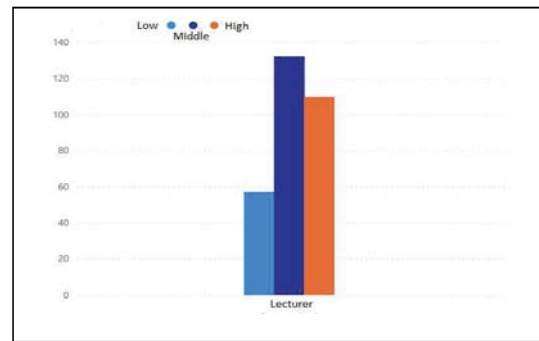
Fig. 6. Lecturer perception of online learning quality assurance

The score constraints on online learning are also visualized using bar graphs. Results show that respondents considered that there is still a considerable obstacle to online learning. Fig. 7 explains that most respondents measured the skill constraint using the asynchronous application on a Likert score of about 4. The same circumstances are shown in Fig 8. about constraints on limitations of Internet access.

Fig. 7. Online learning constraints on asynchronous application usage skills

Fig. 8. Online learning constraints on limited Internet access

37

The study also conducted a text analysis of questions about the activities that respondents wanted for online learning preparation. Their response in the Indonesian language was analyzed using the Word Cloud method in Microsoft Power BI (Fig. 9). Results show some of them wanting webinar activities to train the use of online learning support applications. Fig 10. gives information that many respondents want to provide Internet quota and training for increased skills in online learning.

Fig. 9. Text Analysis with Word Cloud Power BI

Fig. 10. Text Analysis with Word Cloud Power BI

B. ELR Score Analysis

1) Validity and Reliability Test Results

Validity testing shows significant results. It is stated that all questions on each variable are valid (Table I). Similarly, the value given by the reliability test, the results show that all the observed variables are reliable (Table II). Both of these mean that all questions on the questionnaire are a consistent and suitable question.

TABLE I.   VALIDITY TEST RESULT

No.	Variable		
	Description of Variable	P-Value	Result
1.	The skill of using e-learning technology (V1)	0.000(all questions)	Valid
2.	The perception of benefits and quality assurance of online learning (V2)	0.000(all questions)	Valid
3.	Policies and ICT support for online learning (V3)	0.000(all questions)	Valid
4.	Constraints on online learning (V4)	0.000(all questions)	Valid

TABLE II.   RELIABILITY TEST RESULT

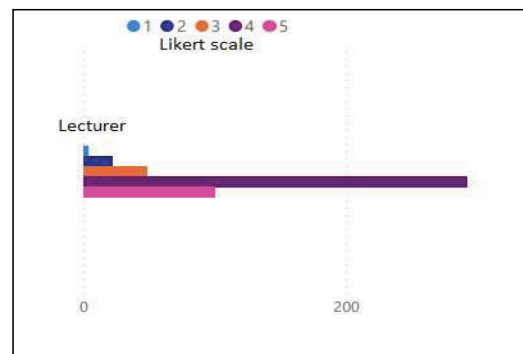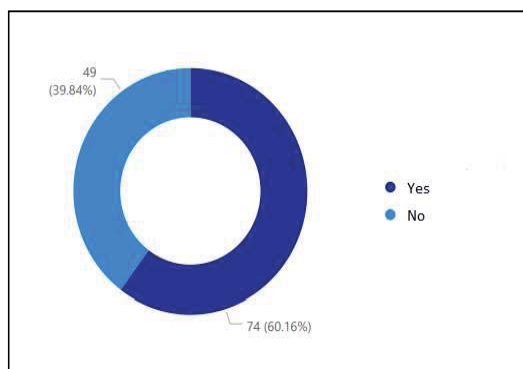| No.	Variable		
	Description of Variable	Cronbach's AlphaValue	Result
1.	The skill of using e-learning technology (V1)	0.864	Reliable
2.	The perception of benefits and quality assurance of online learning (V2)	0.654	Reliable
3.	Policies and ICT support for online learning (V3)	0.644	Reliable
4.	Constraints on online learning (V4)	0.864	Reliable

2) Finding ELR Variable Score

The ELR score analysis begins by calculating the average score of each question in each variable. The average result of a variable score V1 reveals a value of 3.989 that is greater than the Aydin & Tasci 3.4 limit. This indicates that the average level of lecturers ' skills in the operation of hardware (PC, Laptop, Tablet, Tab or Pad), asynchronous Applications (Mols or Google classroom) and synchronous (MS Teams, Zoom, Cisco Webex) are relatively high and stable. This is not surprising, because lecturers have a stable economic ability to have hardware as well as operate it. An explanation of the observed variables is in Table III and The ELR score calculation results are presented in Table IV.

TABLE III.   VARIABLE OBSERVATIONS

No.	Variable		
	Description of Variable	Code	Code of Questions
1.	The skill of using e-learning technology	V1	QV11, QV12, QV13
2.	The perception of benefits and quality assurance of online learning	V2	QV21, QV22
3.	Policies and ICT support for online learning	V3	QV31, QV32
4.	Constraints on online learning	V4	QV41, QV42, QV43, QV44
	Total of Questions		11

To find the ELR variable score V2 (Perception of Benefit and quality assurance), data analysis is done to calculate the average score of 2 questions. The results showed a score of 3.016 which was relatively low at the Aydin and Tasci limits. The results illustrate that lecturers ' perception of the benefits and quality assurance of online learning is still low. This is aligned with the results shown in the previous image visualization. But there is no evidence that online learning has no benefits and lower quality than conventional learning[11].

The next variable that is measured is the policy and ICT support for online learning (V3). Lecturers were asked to respond to policies and ICT support, whether they agreed or not. Surprisingly they mostly approve it with the value of ELR 4.504. Although there are still some disagreeing respondents, the score illustrates that these variables slightly support their readiness to implement IT for online learning. The score also shows that it is necessary to improve the

38

understanding of lecturers through socialization about the policies and ICT support on online learning.

TABLE IV.   MEAN SCORES OF AYDIN TASCI EACH VARIABLE

Variable	Means Score of each question		
	Questions	Score	Mean
V1	QV11-Your skill level in the use of online learning support Tools (PC, Laptop, Tab, SmartPhone)	4.146	3.989
	QV12-Your skill level on the use of various asynchronous online learning support app (Mols, Google classroom or others LMS)	3.780	
	QV13-Your skill level on the use of various synchronous online learning support app (MS Teams, ZOOM, Cisco Webex, or others)	4.041	
V2	QV21-How much you score perception of online learning benefits as a conventional learning alternative	3.602	3.016
	QV22-How much your perception scores on online learning quality assurance compared to conventional learning systems	2.431	
V3	QV31-Do you agree to government policy through the Ministry of Education and Culture as a contributing factor to online learning implementation?	4.350	4.504
	QV32-Do you agree to the development of ICT infrastructure as an online learning contributing factor?	4.659	
V4	QV41-Do you agree there is an online learning constraint that is not available supporting tools such as PC, Laptop, Tab, Smart Phone in your location?	3.073	2.931
	QV42-Do you agree there is an online learning constraint that is not available internet support in your location?	3.179	
	QV43-Do you agree there is an online learning constraint that lack of skill operation asynchronous app (Mols, Google classroom or other LMS)?	2.927	
	QV44-Do you agree there is an online learning constraint that lacks skill operation synchronous app (MS Teams, ZOOM, Cisco Webex, or other)?	2.935	
Averages			3.610

The last variable measured is a constraint (V4). The average result shows a value of 2.931 which is smaller than 3.4. This shows that the lecturers assumed that there were still significant obstacles in the application of online learning. Lecturers are very reasonable, considering that online learning involves students who have a variety of issues such as the availability of hardware, internet access, and also the skill level of technology operation.

The overall measurement of the ELR score provides an average value of 3.610 that indicates that the respondents were sufficiently ready for online learning execution. Although the value is greater than 3.4, Aydin & Tasci model hinted to do some treatment. It aims to increase their readiness value especially on low-rated factors such as improved perception and improved skills on technology.

V. CONCLUSIONS

Based on 2 analysis tools i.e. visualization analysis and measurement of ELR with model Aydin & TASCI Score, research concluded that the factors that determine the level of readiness of the lecturer on online learning include technological skills, perception, policies and ICT support and constraints that will be encountered when implementing online teaching. Factors that are still low such as understanding and skill can be improved with socialization and training activities.

REFERENCES

[1] L. D. Herliandry, Nurhasanah, M. E. Suban, and H. Kuswanto, "Jurnal Teknologi Pendidikan Pembelajaran Pada Masa Pandemi Covid-19," *J. Teknol. Pendidik.*, vol. 22, no. 1, pp. 65–70, 2020, doi: https://doi.org/10. 21009/jtp.v22i1.15286 Abstract:

[2] S. C. Healt department, "No Title." https://www.facebook.com/Dinas-Kesehatan-Kota-Samarinda-102415041295389 (accessed Aug. 01, 2020).

[3] M. A. Almaiah, A. Al-Khasawneh, and A. Althunibat, "Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic," *Educ. Inf. Technol.*, 2020, doi: 10.1007/s10639-020-10219-y.

[4] Ramadiani, Azainil, U. Haryaka, F. Agus, and A. H. Kridalaksana, "User Satisfaction Model for e-Learning Using Smartphone," in *Procedia Computer Science*, 2017, vol. 116, doi: 10.1016/j.procs.2017.10.070.

[5] M. University, "Mulawarman Online Learning System." https://mols.unmul.ac.id/ (accessed Jul. 31, 2020).

[6] F. Artwodini Muqtadiroh, M. N. P. Ma'ady, and F. Rizal Rahman, "Ensemble Measurement Model of E-Learning Implementation Readiness for Higher Education Institution," *IJAIT (International J. Appl. Inf. Technol.*, vol. 2, no. 02, 2018, doi: 10.25124/ijait.v2i02.1206.

[7] D. Sulisworo, A. Y. Astuti, and N. Fatimah, "Online learning implementation during COVID-19 mitigation in Indonesia: Measuring the lecturers' technology readiness," *Int. J. Adv. Sci. Technol.*, vol. 29, no. 7, pp. 2252–2263, 2020.

[8] R. vanOostveen, F. Desjardins, and S. Bullock, "Professional development learning environments (PDLEs) embedded in a collaborative online learning environment (COLE): Moving towards a new conception of online professional learning," *Educ. Inf. Technol.*, vol. 24, no. 2, pp. 1863–1900, Mar. 2019, doi: 10.1007/s10639-018-9686-6.

[9] K. Mukhtar, K. Javed, M. Arooj, and A. Sethi, "Advantages, Limitations, and Recommendations for online learning during COVID-19 pandemic era," *Pakistan J. Med. Sci.*, vol. 36, no. COVID19-S4, May 2020, doi: 10.12669/pjms.36.covid19-s4.2785.

[10] A. D. Dumford and A. L. Miller, "Online learning in higher education: exploring advantages and disadvantages for engagement," *J. Comput. High. Educ.*, vol. 30, no. 3, pp. 452–465, Dec. 2018, doi: 10.1007/s12528-018-9179-z.

[11] L. Pei and H. Wu, "Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis," *Med. Educ. Online*, vol. 24, no. 1, Jan. 2019, doi: 10.1080/10872981.2019.1666538.

[12] Microsoft Inc., "Form Microsoft Office." https://forms.office.com/?fromAR=3 (accessed Jun. 30, 2020).

[13] Microsoft Inc., "Microsoft Excel." https://www.microsoft.com/en-us/microsoft-365/excel.

[14] I. Inc., "IBM SPSS Statistics." https://www.ibm.com/analytics/spss-trials (accessed Aug. 01, 2020).

[15] Cengiz Hakan Aydin and Deniz Tasci, "Measuring Readiness for e-Learning: Reflections from an Emerging Country, in

Educational Technology & Society," *Eskisehir*, pp. 244–257, 2005.

[16]   Microsoft   Inc.,   "Microsoft   Power   BI."   https://powerbi.microsoft.com/en-us/desktop/ (accessed Jul. 15, 2020).