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# E-learning Readiness in University of Lampung during Covid-19 Pandemic

Heryandi

Department of Law  
University of Lampung  
Bandar Lampung, Indonesia  
heryandi.1962@fh.unila.ac.id

Muhamad Komarudin

Department of Electrical and Informatics Engineering  
University of Lampung  
Bandar Lampung, Indonesia  
m.komarudin@eng.unila.ac.id

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Hery Dian Septama

Department of Electrical and Informatics Engineering  
University of Lampung  
Bandar Lampung, Indonesia  
hery@eng.unila.ac.id

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Titin Yulianti

Department of Electrical and Informatics Engineering  
University of Lampung  
Bandar Lampung, Indonesia  
titin.yulianti@eng.unila.ac.id

**Abstract**—This paper focuses on the state of readiness of Indonesian higher education to integrate online courses, particularly during study from home as a result of the COVID-19 pandemic. The case study was carried out at the University of Lampung (Unila), one of the state universities of Indonesia. The result shows the rapid increase in the number of visitors to Unila's learning management system during the beginning of studies from home regulations. The Aydin and Tasci E-learning Readiness (ELR) method is used to assess Unila's readiness to implement the online course. The study is also important to show the Unila readiness to support Merdeka Belajar regulation issued by the Ministry of Education and Culture (MOEC) of Indonesia. The result shows that the average ELR score is 4.43. This result indicates that Unila is in a state of readiness for the implementation of e-learning, and the application of e-learning can be continued. However, several things can be improved, especially with regard to ELR factors which have lower scores.

**Keywords**—design thinking, systems thinking, STEM integration, sustainable development, STEM literacy.

## I. INTRODUCTION

The coronavirus outbreak in late 2019 led to a serious infectious disease known as coronavirus 2019 (COVID-19). The COVID-19 pandemic has had a more significant impact in many industries around the world. The Indonesia COVID-19 Acceleration Task Force regularly updates COVID-19 case information. Through Monday, July 20, 2020, 1,693 new COVID-19 cases have been added. As a result, the total number of positive cases of COVID-19 nationally became 88,214 people. Furthermore, the task force also noted that there were 1,576 patients who had recovered, for a total of 46,977 people. Meanwhile, there were 96 more deaths, bringing the total to 4,239. Globally, COVID-19 has affected 216 countries, totaling 14,348,858 confirmed cases and 603,691 deaths [1].

The COVID-19 pandemic has caused not only a health crisis, but also in the socio-economic sectors as well as in the educational sector. According to the United Nations, 94

percent of students from pre-primary to higher education in 200 countries around the world have been affected by the pandemic. This means that 1.58 billion students cannot attend school or university since the government should close school operations to reduce the spread of COVID-19. Governments then adopted a policy to continue the education process during the COVID-19 pandemic using online infrastructure. However, inequality of online infrastructure during education closure will create inequities in the long term.

The Indonesian Ministry of Education and Culture (MOEC) has released a policy known as Merdeka Belajar. The term of Merdeka Belajar means freedom of learning, which is to give students and teachers to be innovative and promote creative thinking. This policy also gives educational institutions opportunities to become independent in determining learning policies. The policy specific to higher education is called Kampus Merdeka. This policy supports the independence and flexibility of the learning process in higher education. This policy also hoped to create a learning culture that is innovative, not restrictive, and according to the need of students that will fulfill the future needs [2].

The purpose of this research is to determine whether the University of Lampung is ready to implement e-learning to support the learning process during the COVID-19 pandemic and to support Kampus Merdeka.

## II. RELATED WORKS

The learning process outside the classroom is often related to e-learning or e-learning or distance learning. The ICT-based learning process or e-learning implements a learning process that utilizes ICT-based media to complement or replace classroom learning activities [3],[4]. There is also a lot of work that studied the effectiveness of online learning or ICT based learning conducted. The work in [5],[6] studied the effectiveness of blended learning that combines traditional learning with online learning and also flipped classroom method. The work in [7] shows the study on synchronous learning and asynchronous learning through ICT. The problem-based learning method with the support of ICTs to increase student engagement and skills is studied in [8].

However, during the COVID-19 pandemic, demand for online learning increases rapidly as a result of home study policies issued to limit the spread of the virus. Work in [9] focuses on the critical success factor in online learning during the COVID-19 pandemic. The results show that technology management and management support will enhance student awareness of the use of the e-learning system. The study also find that the most influential factor to implement online learning during covid-19 pandemic is knowledge management, support, student characteristics, and information technology.

This paper will explore the state of preparedness for e-learning or e-learning during the pandemic, particularly in higher education. Aydin and Tasci's work in developed a model for measuring readiness to implement e-learning used in this research. The University of Lampung data will be used as a case study to study the state of readiness to implement e-learning during the pandemic and the Kampus Merdeka policies.

### III. RESEARCH METHOD

#### A. Method

In terms of the effectiveness of e-learning, what is also important is the personal acceptance of new information and communication systems. The ability of students to use e-learning is the most important factor in determining the effectiveness of e-learning along with other factors. According to [10] there are four factors that determine e-learning. The first is the technology factor which investigates ways of streamlining the adaptation of e-learning as a technological innovation in a university. The innovation factor considers the human resources experience at the university in adopting online learning as a new innovation. The human factor is based on the characteristics of human resources at the university. The self-development factor considers the university's confidence in self-development in the application of eLearning.

TABLE I. AYDIN & TASCIELR FACTOR

Factor	Resources	Skills	Attitudes
Technology	Access to computers and internet (Q2, Q3, Q4)	Ability to use computers and the internet (Q5, Q6, Q7)	Positive attitude toward use of technology (Q8, Q9, Q13, Q16, Q17, Q32)
Innovation	Barriers (Q28)	Ability to adopt innovations (Q26)	Openness to innovations (Q10, Q15, Q33, Q34)
People	<ul style="list-style-type: none"> <li>- Educated students (Q1)</li> <li>- Experienced lecturer (Q21)</li> <li>- An e-learning champion (Q22)</li> <li>- Vendors and external parties (Q25)</li> </ul>	Ability to learn via with Technology (Q23, Q24)	<ul style="list-style-type: none"> <li>- Cooperation between students in using e-learning (Q35)</li> <li>- Cooperation between students and lecturer (Q36)</li> <li>- Cooperation between employees and teachers in managing the e-learning system (Q37)</li> </ul>
Self-development	Budget (Q18, Q19)	Ability to manage time (Q12)	Belief in self-development (Q11, Q14, Q20, Q27, Q29, Q30,

Each of the above factors must be formed of three sides, namely resources, skills and attitudes as in Table I. An online learning readiness analysis) ELR (is required to measure the implementation of online learning. Research findings on e-learning readiness can demonstrate that there are still parts of universities that are not ready for the application of e-learning. Knowing the category for which the university is not prepared, the researcher and management can provide a solution. Proposed solutions include good management, improved infrastructure, and increased human resource capacity in information and communication technologies.

This study uses a descriptive research method with a quantitative approach. This study aims to consider the state of preparedness for the implementation of e-learning as the basis of Unila policies on campus using the ELR Aydin and Tasci models. For the readiness level category, this study uses an index model adapted from Aydin & Tasci [10], namely: : Not Ready, it needs a lot of preparation to implement e-learning (Index 1 - 2) - Not Ready, but it only needs some preparation only to implement e-learning (Index 2.6 - 3.39) - Ready but need improvement in implementing e-learning (Index 3.4 - 4.19) - Ready to implement e-learning (Index 4.2-5).

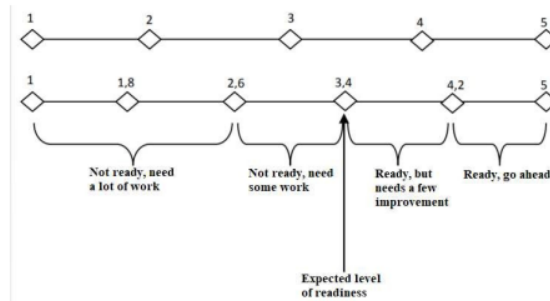


Fig. 1. Aydi Tasci ELR Scale

#### B. Data gathering

Respondents in this study were top executives of Unila, namely the rector and vice-rector, the dean of faculties and the director of the graduate program. The Head of Bureau at Unila, consists of Academic and Student Bureau (BAK), General and Finance Bureau (BUK), Planning and Public Relations Bureau (BPHM). The last is Head of Institute for Learning Development and Quality Assurance (LP3M) and Information and Communication Technology Unit (UPT. TIK). In total, 23 respondents responded to this questionnaire. Sampling of respondents based on the criteria and considerations for applying e-learning readiness, as follows

1. Respondents are seen to be in a position to provide clear descriptions and conclusions about the information held by the institution.
2. Respondents are considered to have general opinions and knowledge of institutional data.
3. Respondents are considered to have expertise in the application of e-learning in an institution

This study used a questionnaire containing 37 questions based on the Aydin & Tasci ELR model with some adaptation for four factors :humans, self-development, technology and innovation .Respondents should place the checklist on the appropriate answer selections on the assessment sheet .The score used is Likert scale (1 – 5) for each evaluation of the response to each question .Once all data is collected, the analysis is performed using an Aydin & Tasci ELR model .The average rating of 3.41 is the minimum grade for e-learning readiness .Therefore,  $\bar{x}_{elr} = 3.41$  which means the minimum average score .The total average of all questions must be  $\bar{x} \leq \bar{x}_{elr}$  to be considered ready for the application of e-learning.

#### IV. RESULTS AND DISCUSSION

##### A. Unila e-learning situation during a pandemic period

At the University of Lampung Integrated Academic Information System(SIAKADU) for the winter semester 2020/2021, a total of 6419 courses was opened .This class was taught by 1,512 teachers with a total number of meetings of 98,057 which had to be held online due to COVID-19 pandemic.

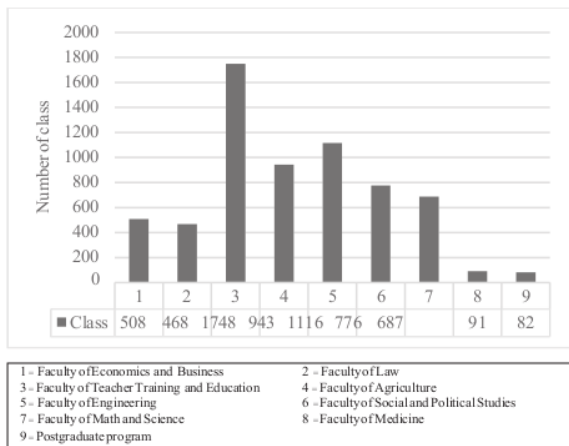


Fig. 2. Total class of Unila during winter semester 2021

Figure 2 shows the total class broken down by the faculties that organized the class .This class is a regular class, since Kampus Merdeka policy, Unila needs to open another class to accommodate students from various universities to study at Unila every semester .Therefore, the total number of classes that need an online course will be increased as well.

The University of Lampung itself has implemented the application of ICTs in the learning or e-learning process based on the Learning Management System (LMS) since 2005 .The number of LMS users has also grown year-over-year, particularly in the early days of the pandemic, when the learning process was moved online .LMS is an application created by providing virtual courses based on information and communication technologies that teachers can then fill with lecture material, assignments, learning resources and more [11]. LMS also facilitates

communication between teachers and students through both chat and forums .With adequate bandwidth available, attendees can also use synchronous media,

for example, with Zoom, Google Meet, Skype that can be used for video conferencing.

Organizing e-learning activities in the context of the COVID-19 pandemic at the University of Lampung is based on President's Decree No .1047/UN26 /KM/2020 March 31, 2020 concerning the Study Period of the University of Lampung Education Program during Covid-19 pandemic

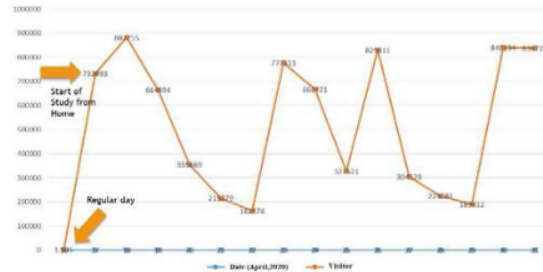


Fig. 3. Statistics of Unila LMS visitor during beginning of the pandemic (April, 2020)

At the start of the online home study period, the visitor to the Unila virtual classroom or the Learning Management System (LSM) grows rapidly. Figure 3 shows an increase in visitors who have accessed <http://vclass.unila.ac.id> or LMS Unila's. LMS Unila visitors per day, which were generally less than 1,500 visitors, jumped very quickly to over 500,000 people per day on weekdays. To support these activities, Unila already has an Internet bandwidth of 2.5 Gbps with a link division of the 1.5 Gbps International and 1 Gbps Domestic link. The increase in the number of courses available online at LMS Unila has increased by over 100% and continues to rise.

However, Unila also permits online courses by using other LMS outside Unila such as Google Classroom, Canvas or similar. The increase will then be continued because Unila also facilitate e-learning training for lecturers. The training process is also provided by the relevant unit to educate the lecturer to use the online module so they can leverage LMS in the implementation of their presentations during the pandemic.

##### B. Unila's e-learning readiness

According to the research method mentioned above, the questionnaire is distributed to the Unila management as a respondent. The questionnaire score was then collected and calculated for every ELR factor. The summary results of the ELR factor are presented in Table II.

TABLE II. UNIVERSITY OF LAMPUNG ELR RESULTS

ELR Factor	Average Score	Category
People	4.48	Ready, the application of e-learning can be continued
Self-development	4.52	Ready, the application of e-learning can be continued
Technology	4.46	Ready, the application of e-learning can be continued
Innovation	4.28	Ready, the application of e-learning can be continued



Table II shows that ELR University at Lampung has an average ELR score ( $\bar{x}$ ) = 4.43 > 3.41. With this ratio following a predetermined scale, Unila is in a state of readiness to implement e-learning, and the application of e-learning may be continued.

The detailed output for each question is shown in Figure 4. The result shows that the score for each question is already above the minimum readiness target.

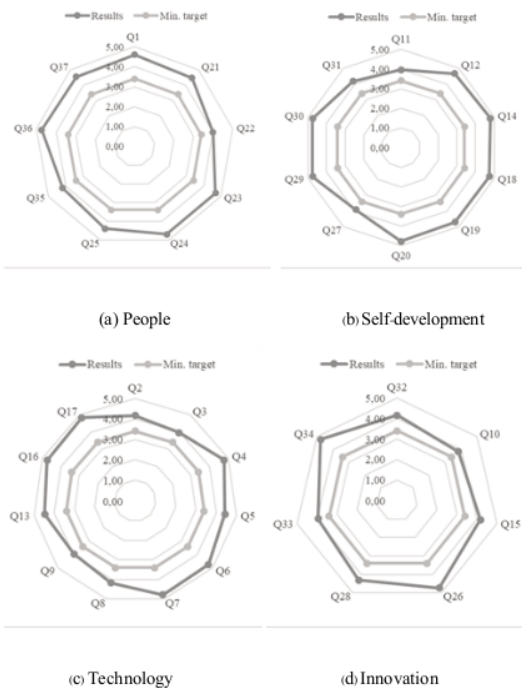


Fig. 4. Detailed ELR score results

However, several things can be improved, especially with regard to ELR factors which have lower scores. The lowest question score is Q10 (Students receive every technological update) = 3.82. The total score of innovation factor has the lowest score, then Unila needs to improve the LMS system to be more user friendly and easy to use. As for the human factor, there is still room for improvement by training the lecturer to make a good online course material or a module to attract student commitments.

The highest question score is Q17 (Agree if e-learning becomes the flagship program on campus) = 4.82. This score results show that Unila management and the academic community has a strong commitment in e-learning implementation. It is the basic foundation of Unila in order to be able to continue to improve other components that still have a lower ELR score.

### C. Validity test

The validity test is used to determine if a questionnaire is valid or invalid. A questionnaire is considered valid if the questionnaire questions reveal something to be measured by the questionnaire. The validity test in this paper uses to construct validity. As for the decision making criteria, the instrument is

said to be valid if the coefficient of correlation  $r_{calc} >$  table with a level of significance 5%, and vice versa.

The calculation of the validity test using SPSS can be found in Table III. The test results of 37 questions for 23 respondents,  $df = N - 2 = 21$  with a probability of 0.05 were obtained table is 0,4132. Then the coefficient correlation for each question is also calculated and compared with the table. The results in Table III show that all of the questions have coefficient correlation above table ( $r_{calc} >$  table). Therefore, the research instrument items used in this paper are valid.

TABLE III. VALIDITY TEST

ELR Factors	Question #	$r_{calc}$	$r_{table}$ (sig.5%)	Status	
People	Q1	0.547	0.4132	Valid	
	Q21	0.554	0.4132	Valid	
	Q22	0.574	0.4132	Valid	
	Q23	0.78	0.4132	Valid	
	Q24	0.676	0.4132	Valid	
	Q25	0.469	0.4132	Valid	
	Q35	0.542	0.4132	Valid	
	Q36	0.478	0.4132	Valid	
	Q37	0.773	0.4132	Valid	
Self-development	Q11	0.817	0.4132	Valid	
	Q12	0.493	0.4132	Valid	
	Q14	0.585	0.4132	Valid	
	Q18	0.838	0.4132	Valid	
	Q19	0.676	0.4132	Valid	
	Q20	0.656	0.4132	Valid	
	Q27	0.815	0.4132	Valid	
	Q29	0.604	0.4132	Valid	
	Q30	0.838	0.4132	Valid	
	Q31	0.542	0.4132	Valid	
Technology	Q2	0.581	0.4132	Valid	
	Q3	0.738	0.4132	Valid	
	Q4	0.593	0.4132	Valid	
	Q5	0.488	0.4132	Valid	
	Q6	0.478	0.4132	Valid	
	Q7	0.656	0.4132	Valid	
	Q8	0.542	0.4132	Valid	
	Q9	0.817	0.4132	Valid	
	Q13	0.554	0.4132	Valid	
	Q16	0.838	0.4132	Valid	
	Q17	0.553	0.4132	Valid	
	Innovation	Q10	0.542	0.4132	Valid
		Q15	0.798	0.4132	Valid
		Q26	0.542	0.4132	Valid
Q28		0.838	0.4132	Valid	
Q32		0.562	0.4132	Valid	
Q33		0.817	0.4132	Valid	
Q34		0.656	0.4132	Valid	

### D. Reliability test

Reliability test is a tool for measuring a questionnaire which is an indicator of a variable is consistent. A questionnaire is considered reliable if an individual's answer to a statement is consistent or stable over time. The instrument reliability test used is Cronbach's Alpha if item deleted.

The calculation of the reliability test is also done using the SPSS shown in Table IV. As can be seen, all values shown in the table are above the coefficient correlation  $r_{table}$  (0.4132). Therefore, the overall reliability of the instrument is considered as reliable.

TABLE IV. RELIABILITY TEST

Question #	Item-Total Statistics			
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	159.91	139.992	0.517	0.96
Q21	160.04	139.771	0.523	0.96
Q22	160.52	137.443	0.535	0.96
Q23	159.83	137.696	0.764	0.959
Q24	159.83	138.877	0.654	0.959
Q25	160.13	140.937	0.436	0.96
Q35	160.35	141.419	0.519	0.96
Q36	159.78	141.36	0.449	0.96
Q37	159.96	137.134	0.755	0.959
Q11	160.57	132.893	0.797	0.958
Q12	159.87	139.846	0.456	0.96
Q14	159.74	140.565	0.561	0.96
Q18	159.78	137.451	0.826	0.958
Q19	159.83	138.877	0.654	0.959
Q20	159.74	139.838	0.635	0.959
Q27	160.61	132.431	0.793	0.958
Q29	159.78	139.996	0.579	0.96
Q30	159.78	137.451	0.826	0.958
Q31	160.35	141.419	0.519	0.96
Q2	160.35	139.692	0.553	0.96
Q3	160.57	134.257	0.709	0.959
Q4	159.74	140.474	0.57	0.96
Q5	160.09	140.628	0.455	0.96
Q6	159.78	141.36	0.449	0.96
Q7	159.74	139.838	0.635	0.959
Q8	160.35	141.419	0.519	0.96
Q9	160.57	132.893	0.797	0.958
Q13	160.04	139.771	0.523	0.96
Q16	159.78	137.451	0.826	0.958
Q17	159.7	141.312	0.531	0.96
Q32	160.35	141.419	0.519	0.96
Q10	160.7	134.221	0.777	0.958
Q15	160.35	141.419	0.519	0.96
Q26	159.78	137.451	0.826	0.958
Q28	160.22	140.178	0.534	0.96
Q33	160.57	132.893	0.797	0.958
Q34	159.74	139.838	0.635	0.959

## V. CONCLUSION

The results show that during the onset of the COVID-19 pandemic, particularly during the study of home regulation is issued the visitor of the Unila LMS is rapidly increased. During winter 2020/2021 with a total of 6,419 classes open virtually through e-learning is a huge increase in course load. The results also show that the University of Lampung has an average EL6 score of 4.43. This means that Unila is ready for the implementation of e-learning to consider the learning process during the pandemic and Kampus Merdeka policies. However, there remains room for improvement in improving student engagement during the online learning process.

The validity and reliability test shows that the results of the investigation are valid and reliable. For future work, it is needed to measure students' perceptions of e-learning, especially during the pandemic. It is also envisioned to develop specific criteria to measure e-learning readiness during the pandemic period in higher education.

## ACKNOWLEDGMENT

The author would like to express gratitude to Institute for Research and Community Service (LPPM), University of Lampung that funded this research.

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