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E-LEARNING IMPLEMENTATION BARRIER IN INDONESIA: A CASE STUDY

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Abstract—Pandemic forces many educational institutions to change their learning delivery. One of the solutions is using eLearning. But, eLearning implementation faces a lot of barriers. This study tried to find the main barrier in eLearning in Indonesia. Systematic Literature Review and Descriptive statistics were used to collect and analyze our findings. The results of this study are separated into four categories: human, technology, organizational, and financial factors. Human factors include lack of interaction, hard to assimilate material, boredom, exhaustion, lack of preparation, and harder to meet the need. Technological factors include lack of technical advice, device, the internet, and power problems. The organizational factor is a lack of technical support. From the financial factors are expensive internet and device. These obstacles need to be addressed separately because each barrier has a different approach to solve.

Keywords: *Barriers, Covid-19, eLearning, SLR, Statistic Descriptive*

Intisari— Pandemi covid-19 memaksa banyak sekali institusi Pendidikan untuk mengubah pola pengajaran yang dilakukan. Salah satu cara yang paling banyak diterapkan adalah pembelajaran dalam jaringan (daring). Namun dalam pengimplementasia pembelajaran daring ini, ditemukan banyak kendala atau penghalang. Penelitian ini berusaha untuk menemukan kendala implementasi pembelajaran daring di Indonesia. Untuk menemukan penghalang tersebut digunakan systematic literature review (SLR) dan deskriptif statistic. Dari hasil penelitian yang dilakukan didapatkan empat kategori penghambat yaitu Manusia, teknologi, organisasi dan keuangan. Dari hasil penelitian tersebut didapatkan hasil hambatan manusia yaitu kurangnya interaksi, sulitnya memahami materi, kebosanan, kelelahan, kurang persiapan dan sulitnya memenuhi keinginan siswa. Dari faktor teknologi ditemukan kendala yaitu kurangnya perangkat, sering kali adanya kendala teknis, internet dan mati lampu. Dari faktor organisasi adalah kurangnya dukungan teknis dari organisasi. Sedangkan dari faktor keuangan adalah mahalnya perangkat dan internet yang dibutuhkan. Masing-masing faktor ini harus diselesaikan secara individu dikarenakan setiap faktor memiliki penyelesain yang unik
Kata Kunci*:* Covid-19, eLearning, Penghambat Implementasi, Statistik Deskriptif, SLR.

INTRODUCTION

eLearning became an integral part of education processes amidst the pandemic condition. This condition occurs because the government policy limits people's opportunities to gather in one place. This policy made eLearning one of the educational institution's solutions to ensure that the education process works. eLearning itself was not a novel idea. But, the benefit of these learning methods became more noticeable in this pandemic condition (Rafique et al., 2021), and also, a lot of educational institutions became aware of eLearning benefits. Therefore eLearning is considered a strategic tool to gain competitive advantages (Coopasami et al., 2017). Informal learning educational institutions like Coursera, Udemy, and Purwadhika already used eLearning as their educational methods. They are deemed effective as learning methods because their certificate can be used as technical certification.

There were a lot of studies that tried to find how and why the eLearning implementation in higher education like university feel ineffective. Some studies attempted to find the readiness of eLearning implementation, for example, the research from Ghulam et al. (Rafique et al., 2021), Keramati et al. (Keramati et al., 2011), and Coopasami et al. (Coopasami et al., 2017). Knowing

how ready the organization is to implement eLearning is considered critical for successful eLearning Implementation. Other studies also focused on the barrier of eLearning implementation, such as the research conducted by Abu Hammad, who tried to identify the barrier children face in the implementation of eLearning in Jordan (Abuhammad, 2020). Aminu et al. also tried to identify the barrier of eLearning in Nigeria (Aminu & Rahaman, 2014). Another research conducted by Anna et al. (Fraszczyk & Piip, 2020) tried to identify barriers in railway sectors eLearning.

Research or studies on barriers can be generalized because many areas have different barriers. For example, Aminu et al.(Aminu & Rahaman, 2014) the research found that the main barriers in eLearning in Nigeria are infrastructure and financial. But, if we see the results of Anna et al.'s research on railways eLearning in Australia (Fraszczyk & Piip, 2020), They found that infrastructure is not one of the barriers they found. The main finding of Anna et al. is more focused on the people problems like skill and interaction.

This research tried to find what the Indonesian academic community member deemed the barrier in Indonesia's eLearning implementation. The result of this research will be presented in the descriptive statistic. The institution and government can use the results of this study to make a more effective strategy or eLearning system.

MATERIALS AND METHODS

This research is descriptive statistic research. We start the studies by conducting a Systematic Literature Review (SLR). The result (SLR) has been published in our previous publication (Satria, 2022). We used the Kitchenhamm SLR framework to gather barriers from several research databases. The Kitchenhamm protocols can be seen in Figure 2 SLR Protocols. After gathering the barrier factors of eLearning, we create a questionnaire to collect the data from respondents. Before we spread the questionnaire, we conduct a simple readability and validity test to see the wording in the questionnaire. The questionnaire that we made was shared with several people to check if they could understand the wording of the questionnaire. The questionnaire spread into several academic communities. We do not limit the respondents only from higher education but also from another level of education as long as it is formal. After the data was gathered, we cleaned it and processed it into descriptive charts and diagrams. Descriptive statistics is methods to summarize and provide the statistical information in diagram, therefore It could be easier to take conclusion from (Yao et al., 2022). Figure 1 Research Methodology shows the methodology of this research.

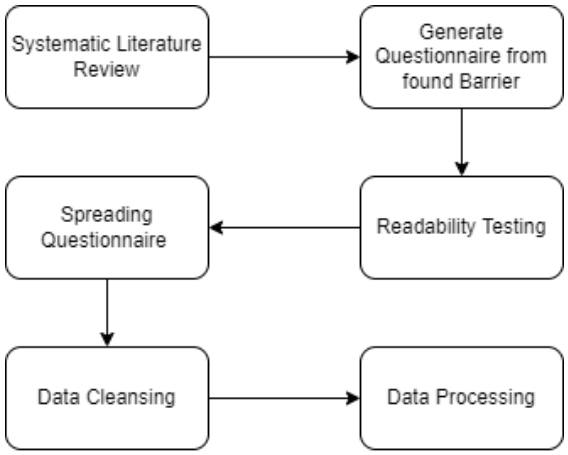

Figure 1 Research Methodology

Tabel 1 eLearning Implementation Barriers

Code	Barrier of eLearning	Source	Code	Barrier of eLearning	Source
	Human			**Technology**	
H1	Lack of Interaction	(Ismaili, 2021), (Abuhammad, 2020)	T1	Accesibility	(Ismaili, 2021; Montazer & Kareem Al-Rikabi, 2021)
H2	Harder to Assimilate Material	(Ismaili, 2021)	T2	Dificulty in Online Exam	(Ismaili, 2021)
H3	Resistancy	(Ismaili, 2021), (Idris & Osman, 2016), (Montazer & Kareem Al-Rikabi, 2021), (Naveed, Qureshi, Alsayed, Muhammad, et al., 2018)	T3	Inaappropriate Infrastructure	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018; Roman & Plopeanu, 2021), (Aminu & Rahaman, 2014)
H4	Lack of ICT Skill	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018; Naveed, Qureshi, Alsayed, Muhammad, et al.,	T4	Technical Problems	(Abuhammad, 2020; Idris & Osman, 2016; Stefancik & Stradiotova, 2021)

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		2018), (Abuhammad, 2020), (Fraszczyk & Piip, 2020)			
H5	Lack of Digital Literacy	(Fraszczyk & Piip, 2020; Naveed, Qureshi, Alsayed, Ahmad, et al., 2018)	T5	Lack of Technological device like computer	(Aminu & Rahaman, 2014; Montazer & Kareem Al-Rikabi, 2021)
H6	Lack of English Profiency	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018), (Idris & Osman, 2016), (Montazer & Kareem Al-Rikabi, 2021; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018)	T6	Internet problems	(Montazer & Kareem Al-Rikabi, 2021), (Aminu & Rahaman, 2014; Roman & Plopeanu, 2021; Stefancik & Stradiotova, 2021), (Abuhammad, 2020)
H7	Weak Motivation	(Montazer & Kareem Al-Rikabi, 2021; Naveed, Qureshi, Alsayed, Ahmad, et al., 2018; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018), (Stefancik & Stradiotova, 2021)	T7	Power Problems	(Aminu & Rahaman, 2014; Montazer & Kareem Al-Rikabi, 2021)
H8	Lack of Pedagogical Skill	(Fraszczyk & Piip, 2020; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018)(Abuhammad, 2020)(Roman & Plopeanu, 2021)			
H9	Education Method	(Abuhammad, 2020; Montazer & Kareem Al-Rikabi, 2021)			
H10	Lack of Compensation and Time	(Fraszczyk & Piip, 2020; Montazer & Kareem Al-Rikabi, 2021; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018)			
H11	Distrust	(Montazer & Kareem Al-Rikabi, 2021; Stefancik & Stradiotova, 2021)			
H12	Boredom	(Montazer & Kareem Al-Rikabi, 2021)			
H13	Frustation	(Montazer & Kareem Al-Rikabi, 2021; Roman & Plopeanu, 2021)			
H14	Exhaustion	(Stefancik & Stradiotova, 2021)			
H15	lack of student preparation	(Abuhammad, 2020)			
H16	Inability to meet students' need	(Abuhammad, 2020)			
	Organizational			**Financial**	
O1	Lack of Technical Support	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018)(Naveed, Qureshi, Alsayed, Muhammad, et al., 2018)	F1	Financial Condition	(Aminu & Rahaman, 2014; Montazer & Kareem Al-Rikabi, 2021)
O2	Lack of Financial Support	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018)	F2	Lack of Investment	(Abuhammad, 2020)
O3	Lack of Inadequate Policy	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018)	F3	Expensive device	(Abuhammad, 2020; Aminu & Rahaman, 2014)
O4	Lack of Training in eLearning	(Naveed, Qureshi, Alsayed, Ahmad, et	F4	Expensive internet	(Abuhammad, 2020)

		al., 2018), (Idris & Osman, 2016), (Aminu & Rahaman, 2014; Montazer & Kareem Al-Rikabi, 2021)
05	Lack of Instructional Design	(Naveed, Qureshi, Alsayed, Ahmad, et al., 2018)
06	Privacy and Security	(Idris & Osman, 2016)
07	Shortage of Technical Staff	(Abuhammad, 2020)
08	Cultural	(Montazer & Kareem Al-Rikabi, 2021)
09	lack government support	(Montazer & Kareem Al-Rikabi, 2021)
010	Lack of quantity and quality Content	(Montazer & Kareem Al-Rikabi, 2021)

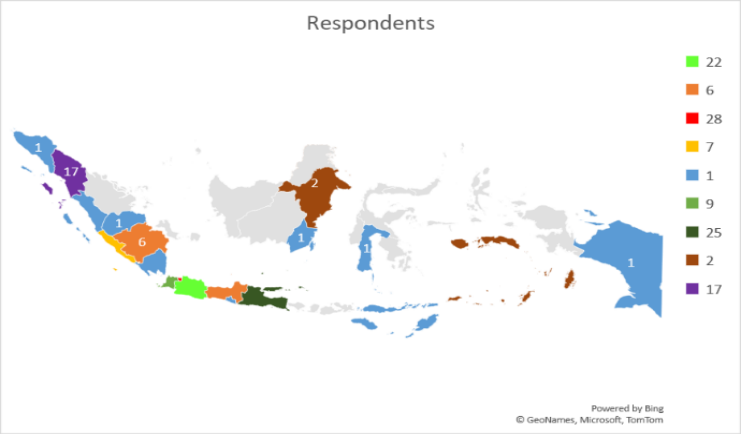

Figure 2. Respondent Sources

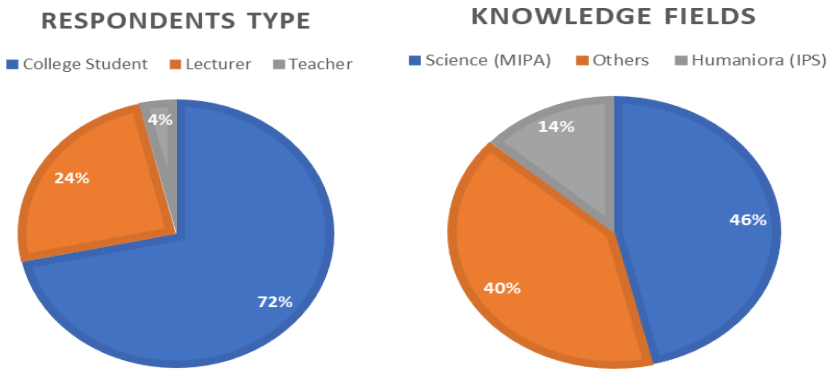

Figure 3. Respondents Type and Knowledge Fields

RESULT AND DISCUSSION

After collecting and clustering the barrier we found, we created the questionnaire and shared it with some colleagues to check if our questionnaire was easy enough to understand and won't have any possibilities to confuse our respondents. The questionnaire can be accessed through this link https://bit.ly/eLearningInd. The questionnaire used a Likert scale from 1 to 5, where 1 strongly disagrees and 5 strongly agrees.

We gathered 136 data from all around Indonesia. After some data cleansing, we gathered 134 data. The demographic data can be seen in Figures 2 through 3. In Figure 2, we can see that we could gather some representatives from western and eastern Indonesia; even though the number doesn't look balanced, it is pretty representative. In

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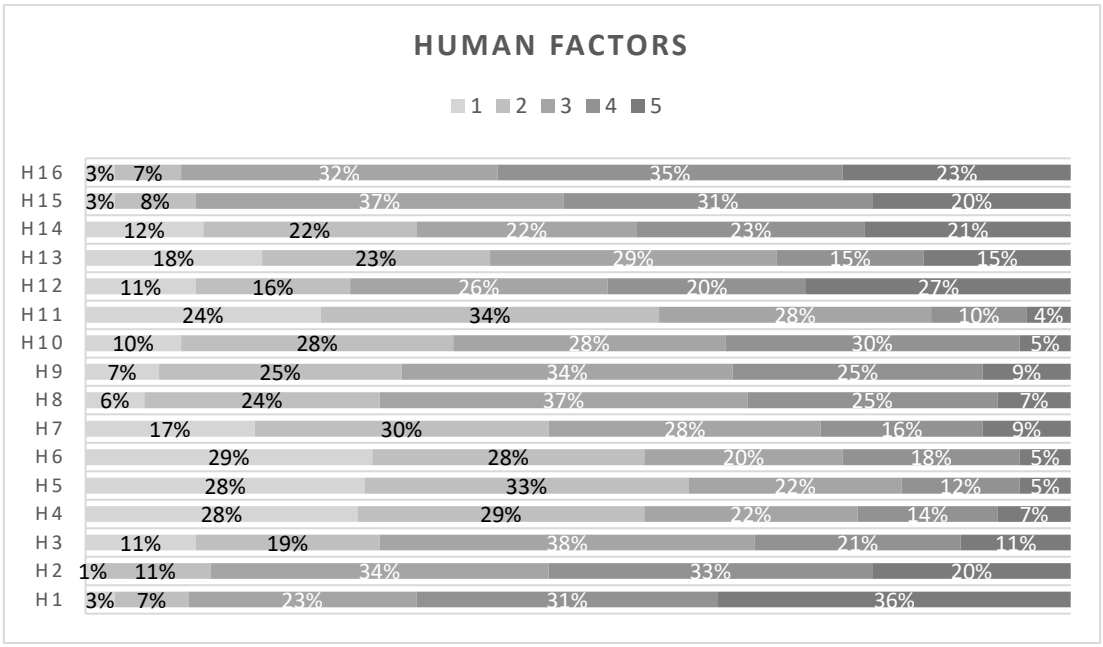

Figure 4 Human Factors

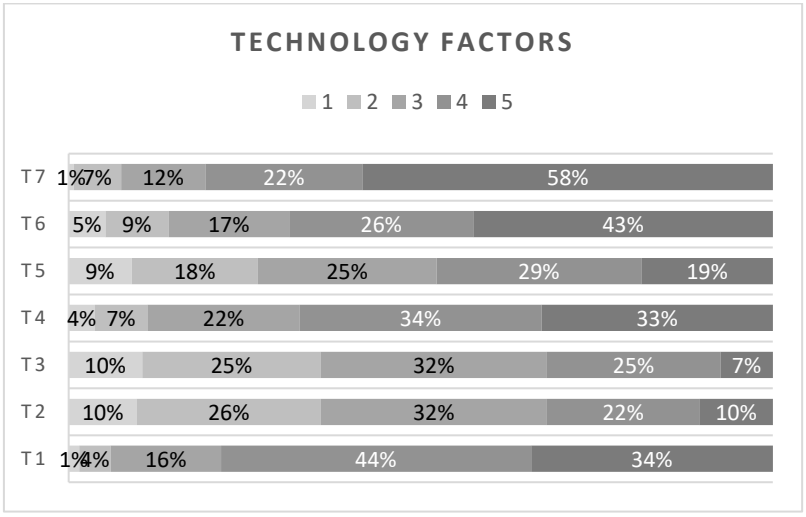

Figure 5 Technology Factors

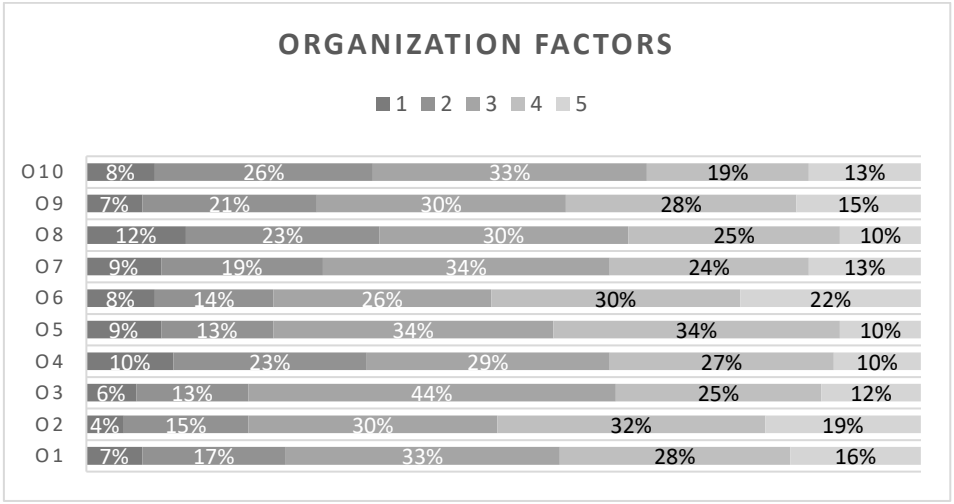

Figure 6 Financial Factors

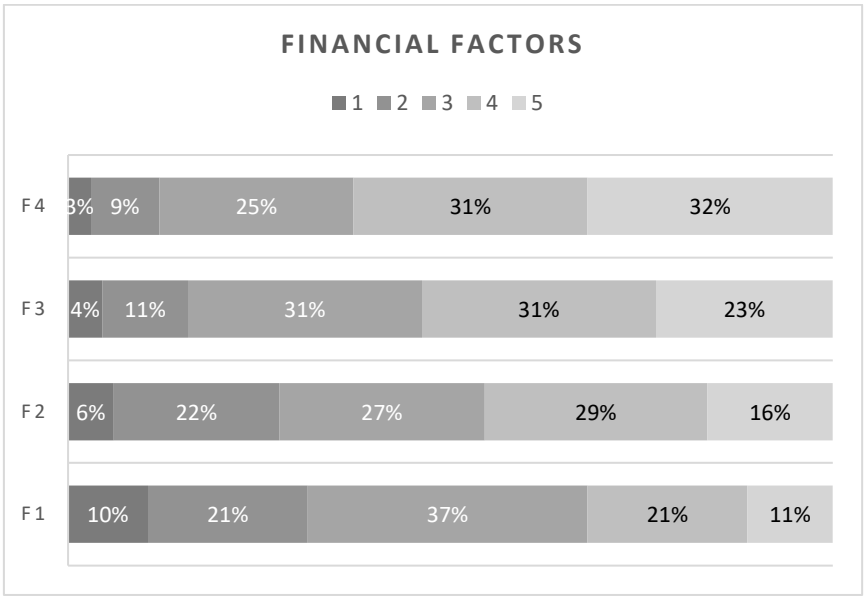

Figure 7 Technological Factors

figure 3, we can see that the respondent's types are Mahasiswa (College Students), Guru (Teacher), and Dosen (Lecturer). The main respondents in this survey are college students and lecturers because almost all universities are conducting eLearning amidst this pandemic. From Figure 4, we can see that the respondent's fields almost event between Science and Humaniora. This research will consider the scale 3 as abstain or neutral. Therefore we will consider only the results on a scale of 1 and 3 for disagree and 4 and 5 for agree. In this research, we do not gather the age, and gender data, because it doesn't relate to the outcome we expected. In this research, we only want to know the perspectives of eLearning from both students and teachers in the implementation of eLearning they currently use.

From Figure 4 Human Factors, H1 became one of the most agreed barriers, with 35% Strongly Agreeing and 31.6% agreeing. The eLearning methods usually used are conference meetings or self-studied, which diminishes the interaction in learning even though interaction is one of the key components of successful studies (Okita, 2012). The interaction, in this case not limited to interaction between teacher and students but also between the students. This research also related to the next barrier, which is H2. In their research, Okita (Okita, 2012) mentioned that interaction help students in processing and understanding the materials.

On the other side, English is not a learning barrier for Indonesian academic society, even though Indonesia ranked 80th among 112th countries indexed based on the EF survey. This result directly relates to other barriers, which are the IT literacy barrier. Based on Kusumastuti et al., (Kusumastuti & Nuryani, 2020) Indonesia ranked third for digital literacy in ASEAN, below Singapore and Thailand. Our finding is a bit different from research (Naveed, Qureshi, Alsayed, Ahmad, et al., 2018), (Idris & Osman, 2016), (Montazer & Kareem Al-Rikabi, 2021; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018), which mentioned that one of the barriers in the eLearning their case studies faced is the English proficiency of the eLearning user.

The next barrier we found considered as the eLearning barrier is H12 and H14. This finding is supported by the other research from Montazer et al. (Montazer & Kareem Al-Rikabi, 2021) and Stefancik et al. (Stefancik & Stradiotova, 2021). Staring at a PC monitor all day long can make the learner and the lecturer or teacher become exhausted.

H15 also became a barrier to learning in this research finding. Of 43 people filled agree and 27 filled strongly agree, 46 data came from students and college students, and only 24 data from teachers.

The next barrier is hard to meet students' H16. We gathered that 56 students agree with this barrier, which means they don't feel the learning material or the learning season meets their expectations. To tackle this barrier, the lecturer and the institution need to conduct some research to see their expectations and how to achieve them.

The next barrier is technology as can be seen in Figure 5 Technology Factors. A lot of research found that technology is one of the main

reasons eLearning cant run as well as expected, especially in this sudden pandemic condition.

We found that T4, T5, T6, and T7 became the main barriers from the technological aspect. This barrier was also found by (Abuhammad, 2020; Montazer & Kareem Al-Rikabi, 2021), (Aminu & Rahaman, 2014; Roman & Plopeanu, 2021; Stefancik & Stradiotova, 2021) in their respective case studies, which were mainly conducted in developing countries such as Iraq, Slovakia, Nigeria, and Romania. In Indonesia itself, this problem became more prevalent in the pandemic condition.

Many students and teachers in developing areas can't conduct learning activities because of the lack of supporting infrastructure. This finding is also supported by the result of a study conducted by CIPS in 2020 (Azzahra, 2020). Their finding found that making reliable internet infrastructure is hard in Indonesia. The hard topography in Indonesia made this problem occur, especially in remote areas.

The next factor is organizational factors as can be seen in Figure 6 Organizational Factors. O1, especially from the perspective of new users, became a barrier. This problem was also found by (Naveed, Qureshi, Alsayed, Ahmad, et al., 2018; Naveed, Qureshi, Alsayed, Muhammad, et al., 2018). They found that good technical support can help the user troubleshoot their difficulties.

The last category of barrier is financial factors as can be seen in Figure 7 Financial Factors. The factor considered barriers by our respondents are expensive internet (F4) with 30.9% agree and 31.6 % strongly agree, expensive devices (F3) with 30.9% agree and 22.8% strongly agree, and lack of institutional investment with 28.7% agree and 16.2% strongly agree.

This result is expected in this pandemic condition. As we know, the Indonesian economic growth in pandemics decreased in 2020 (BPS, 2021). This condition affected a lot of sectors in Indonesia. On the other side, the study from CIPS [17] also found that many students, especially the low income and students who live in the countryside, are greatly affected by this condition. Therefore another way of study is needed to tackle these problems.

CIPS (Azzahra, 2020), in their studies, gave some recommendations to tackle these problems, especially for technological and financial factors. One of the solutions is using national television to provide the materials needed, especially for elementary through senior high school. This recommendation was already implemented prior to this research.

After finding the barriers to implementation, we could determine the required requirements to implement eLearning better in the future. For this requirement, we focused on the system functionality. We divide the functionality based on the barriers.

From the human factors, we know that most of the implemented eLearning at this time was boring, lacked to no interaction between the students and the lecturer or the teacher, exhaustion, and lack of preparation. eLearning could have something fun like a game or gamification function in the eLearning. The gamification functionality is already used by many learning platforms such as Duolingo, as shown in Figure 8.

As the eLearning implementer or developer, the educational institution could adopt this kind of functionality in their LMS. The learner won't feel burdened by the materials and not be as easily bored.

Another functionality that can be added to the LMS is the community function. Duolingo implemented this functionality in order to enhance the interaction between the user on their platform. eLearning, especially Moodle-based, actually also had this functionality.

Having the community features in the LMS could enhance the learning experience and make the learning process more fun because the learner feels as if they interact with their friend. In this scenario, the teacher could lead the discussion and give additional information to the discussion.

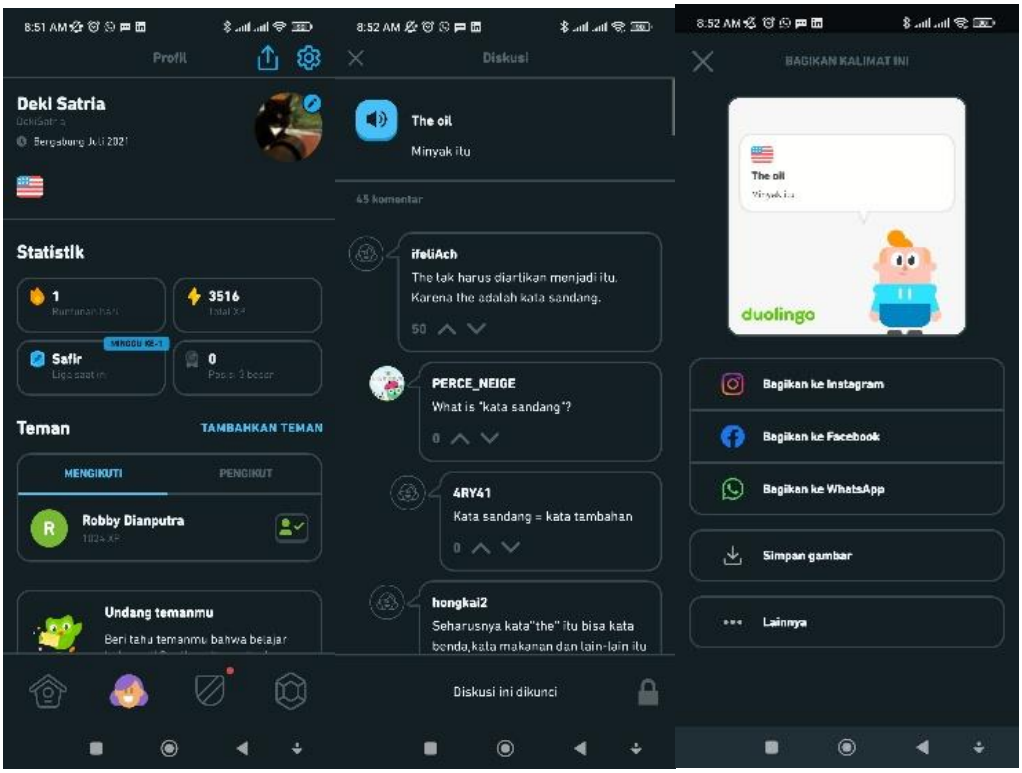

Figure 8 Duolingo Gamification and Community Feature

CONCLUSION

eLearning Implementation in the organization has several barriers from the three criteria: Human, Technologies, Organization, and Financial. The Human Factor barriers found in this research are Lack of Interaction in the Learning Process, Harder Material Assimilation, Boredom, Exhaustion, Lack of Preparation, and Inability to meet Student's Needs. From the Technological Perspective, the barriers found are Technical Problems, Lacking technical devices, Internet Problems, and Power Problems. From the Organization's Perspective, lack of Technical Support became the main barrier; from Financial Perspective, Expenses for the device on the internet became the main problem.

To tackle the barriers, implementing the Gamification feature can reduce boredom and increase the interaction between the students and students and student and the teacher/lecturer. Using national television as the learning method could also reduce eLearning expenses. Another method that can be implemented to tackle these problems is implementing a community to help other learners, which can also act as technical troubleshooters for the problems met by the learner.

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