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The Effectiveness of Online Learning Using E-Learning During Pandemic Covid-19

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ABSTRAK

Permasalahan yang sering terjadi ketika perkuliahan online adalah, materi yang disampaikan oleh dosen tidak secara maksimal diajarkan karena kurangnya pemanfaatan dari media pembelajaran yang baik. Penelitian ini bertujuan untuk menemukan penggunaan platform pembelajaran online yang efektif pada pendidikan tinggi. Penelitian menggunakan pendekatan kualitatif, yang sasarnya analisis, investigasi dan penilaian efektivitas perkuliahan online menggunakan e-learning di Indonesia pada masa pandemi Covid-19. Selain itu, penelitian ini juga membandingkan e-learning mana yang mudah untuk digunakan, e-learning yang memiliki fitur lengkap dan e-learning yang ekonomis. Subjek dalam penelitian ini adalah mahasiswa yang terdaftar di berbagai perguruan tinggi yang ada di Indonesia dengan jumlah mahasiswa sebanyak 136 mahasiswa. Metode pengumpulan data dilakukan dengan cara membagikan kuesioner melalui google formulir kepada mahasiswa. Dalam penelitian ini, menggunakan dua analisis: analisis deskriptif, dan analisis respons kualitatif. Indikator yang digunakan untuk melihat efektivitas e-learning adalah Banyak digunakan, Mudah digunakan, Fitur lengkap, dan Ekonomis. E-learning yang paling banyak digunakan di Indonesia adalah WhatsApp Group, Google Classroom, Ms. Teams, Schoology, Edmodo, dan Moodle. Dari hasil analisis ditemukan bahwa e-learning yang paling efektif digunakan saat pandemi adalah Moodle. Karena Moodle memiliki fitur yang lengkap dan menarik dibandingkan dengan e-learning lainnya.

ABSTRACT

Problems that often occur when online learning are, the material delivered by lecturers isn't optimally taught due to lack of use good learning media. This study aims to find the effective use of online learning platforms in higher education. The research uses a qualitative approach, which aims to analyze, investigate and assess the effectiveness of online learning using e-learning in Indonesia during the Covid-19 pandemic. In addition, this study also compares which e-learning is easy to use, which has full-featured e-learning and which is economical. The subjects in this study were students enrolled in various universities in Indonesia with a total of 136 students. The method of data collection was done by distributing questionnaires via google forms to students. In this study, two analysis were used: descriptive analysis, and qualitative response analysis. The indicators used to see the effectiveness of e-learning are widely used, easy to use, full-featured, and economical. The most widely used e-learning in Indonesia are WhatsApp Group, Google Classroom, Ms. Teams, Schoology, Edmodo, and Moodle. From the results of the analysis it was found that the most effective e-learning used during a pandemic was Moodle. Because Moodle has complete and interesting features compared to other e-learning.

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1. INTRODUCTION

The outbreak of COVID-19 (CoronaVirus Disease) is increasingly spreading all over the world. This epidemic experienced a very fast transmission process so that in a short time it was able to infect the world community (Dryhurst et al., 2020; Goldberg, 2021). The latest WHO data shows that the number of confirmed positive patients in 216 countries is 107 million cases, of which 362 million people have recovered and 5,2 million people have died (Amit et al., 2020; Hew et al., 2020). Indonesia is one of the countries that have been affected by a similar impact from the beginning of March 2020 until now. Data sourced from the Indonesian Task Force for the Acceleration of Handling COVID-19 shows the number of confirmed positive patients as many as 4,3 million people of which 144.000 patients were declared cured and 32.381 patients were declared dead spread across 34 provinces in Indonesia (Prasetyanto et al., 2022; Rahardja et al., 2022).

The rapid spread of COVID-19 has disrupted various sectors (Amit et al., 2020; Supriatna, 2020). At first, this outbreak had a severe impact on the economic sector, but now the impact is also being felt by the education sector. The policy carried out by various countries in the world including Indonesia is to eliminate all face-to-face

learning activities (Balkist & Agustiani, 2020; Lestari & Gunawan, 2020). This policy was carried out to minimize the spread of COVID-19 (Mastura & Santaria, 2020; Yunus & Rezki, 2020). The presence of this policy causes various related parties to immediately provide alternative solutions so that learning activities can take place even without face to face. The alternative solution in question is in the form of learning activities carried out online. The solution is intended for all levels of education, from early childhood education to higher education (Jung, 2020; Puspitorini, 2020). Lectures conducted online are the implementation of learning by eliminating time and distance by utilizing electronic learning (e-learning) internet-based to be able to support the learning process without physical interaction (Khusniyah & Hakim, 2019; Lestari et al., 2020).

Online learning really need good cooperation between all parties, both from the lecturers and students. This condition causes all lecturers to be technology literate, required to be creative in delivering material through online learning media, and be able to read student situations and conditions (Kuntarto, 2017; Riyanti & Paramida, 2020). In addition, students must also provide information related to family conditions, the economy, and the state of the internet. This is very important so that lecturers can provide waivers and substitute assignments. The problem in the world of lectures is that the lecture process is not uniform, both the standard and the quality of the desired lecture outcomes (Bahasoan et al., 2020; Hew et al., 2020). Online learning, especially during this pandemic, really need the support of various electronic devices, such as smartphones and laptops. This electronic device can be used to access some information anytime and anywhere. The use of electronic-based technology makes a major contribution to the world of education (Astini, 2020; Hamad, 2015). The contribution in question is the achievement of lecture goals and a positive impact on students (Firman & Rahman, 2020). The problems that will occur in online learning is students have difficulty or are unclear in understanding the material given by the lecturer, the learning media is only powerpoint or sound (Mardesci, 2020). It could also be about texts, internet connection problems, internet signal problems for certain areas so that it is difficult to find task info and follow, and the number of assignments is not proportional to the lack of lecturer explanations. In addition, online learning will affect student motivation, interest and learning outcomes, if online learning is not carried out optimally (Nurfarini & Saugi, 2020).

For the implementation of online learning take place optimally, the use of various e-learning also needs to be done. There are various types of e-learning as a medium in the implementation of learning online. E-learning is defined as a lecture system that uses electronic devices for learning media. E-learning is a type of teaching and learning that allows the delivery of teaching materials to students using internet media, or other computer network media (Wright, 2017; Yustanti & Novita, 2019). The utilization of media e-learning through computers or smartphones in the learning system can become independent learning students (Bao, 2020; Kristiawan, 2017). E-learning provides easy and fast learning for increased access to lectures, and clear accountability in the learning process (Basak et al., 2018). E-learning has several characteristics, namely 1) Utilizing electronic technology, computer networks, and digital media, 2) Using independent teaching materials and stored on computers or smartphones that can be accessed by lecturers and students anytime anywhere, 3) As well as utilizing lecture administration either schedule, curriculum, learning progress, to be viewed at any time on a computer or smartphone (Allagui, 2014; Mishra et al., 2020). There are several applications and digital platforms used by learning during the COVID-19 outbreak, namely WhatsApp Group, Google Classroom, Google Meeting, Edmodo, WhatsApp Group, Zoom Meeting, Schoology, Microsoft Teams, Moodle, and so on (Cakrawati, 2017; Saifuddin, 2018). Therefore, the selection of the right e-learning will be able to make the interest, enthusiasm, and motivation of students participating in online learning will be the same when participating in face-to-face learning (Garbe et al., 2020; Puspitorini, 2020).

Apart from that, it is also important to pay attention to the enthusiasm of students in participating in online learning. This needs to be done so that lecturers can find out which e-learning is most suitable for online learning during this pandemic (Mustaqim et al., 2022; Nash & Churchill, 2020). The following is data on the enthusiasm of students in Indonesia in participating in online learning during the Covid-19 pandemic are Equally note interested is 9%, Less interested 34.3%, Quite interested 40.3% and Very interested 16.4%. Based on data, that students are quite interested in taking online learning using e-learning. This means that students are enthusiastic quite to take part in learning using e-learning used by lecturers. The use of e-learning suitable will be able to attract the attention of students to keep the spirit of attending learning even though it is an online system (Longhurst et al., 2020; Saifuddin, 2018). Therefore, it is necessary to research to see which e-learning is good for lectures to use to make enthusiastic students more interested. Educators who follow the times or the industrial revolution 4.0 will definitely find it easier to use several learning media that can attract the attention of students (Amin & Mustaqim, 2021).

Research who examined the effectiveness of Undiksha e-learning as one of the official learning media for the Physical Education Study Program which showed the results of the study that Undiksha E-Learning during the covid-19 pandemic in the Physical Education Study Program was quite effective (Satyawan et al., 2021). Furthermore, research which examines the effectiveness of online-based learning in higher education in terms of aspects of planning, implementation, evaluation, constraints and strategies towards new habits, the results of the

study show that 1). planning, implementation and evaluation of online-based learning get an assessment in a good category, 2) online-based learning constraints can be overcome with a blended learning model strategy, practical courses are carried out face-to-face, selecting materials and courses online, online learning is done through virtual face-to-face, attitude assessment using various instruments, and lecturers assign assignments according to the number of credits for the course (Dwikurnaningsih & Waruwu, 2021). In line with the two studies above which both discuss the effectiveness of e-learning, this study will also discuss which e-learning is most effectively used during this pandemic to increase students' enthusiasm and motivation to learn. This study also compares which e-learning is easy to use when online learning is carried out. Easy here will show how e-learning is easy to access, easy to use and easy to combine. In addition, this research will also determine which e-learning has complete features, so that it can make it easier for lecturers and students to carry out online learning activities. Then, this research will also see which e-learning is the most economical in terms of data pulses. Data pulses are the most important part, because with insufficient data pulses, students cannot take online learning.

2. METHOD

This study uses a qualitative approach with a survey design, where data collection in this study uses research instruments and the presentation is related to numbers (Sugiyono, 2014). The figures presented will be compared by describing the level of effectiveness of using some e-learning during the Covid-19 pandemic. The sample in this study were students who represented each university in every province in Indonesia. Sampling was done by purposive sampling where the sample was taken based on students who were studying at universities that had the best ranking in each province (Sugiyono, 2014). Instruments are made based on facts in the field regarding various complaints in online learning conducted during the pandemic (Sibuea et al., 2021). The assessment questionnaire consists of 20 questions to evaluate subject knowledge. The questionnaire was made based on the following indicators: 1) widely used, 2) Easy to use, 3) Complete features, and 4) Economical. These indicators will be used as a reference to see the effectiveness of e-learning. Filling out the questionnaire is done by using Google Form. The Google Form link is distributed to respondents or students who represent each university in their province which amounts to 136 student. The data analysis used is data grouping techniques based on regions and indicators which includes the calculation of the average or mean (M), frequency line and circle chart of the variables studied.

The questionnaire was validated by asking a jury of university lectures to give their remarks about the questionnaire. Their suggestions were taken into consideration by deleting and adding some items. The validity results obtained are r_{count} of 0.497. For the r_{table} value of 40 students is 0.320. In accordance with the rules of instrument validity, if $r_{\text{count}} \geq r_{\text{table}}$ and vice versa. The whole research questionnaire is valid where $r_{\text{count}} > r_{\text{table}}$ ($0.497 > 0.320$). The reliability of the questionnaire was tested by choosing a pilot sample consisting of 40 students. Cronbach's alpha was estimated to test the reliability of the scale, and its value ranged between 0.84 and 0.89 in the case of domains and was 0.91 for the whole scale. This showed that there was a high reliability of the questionnaire. The questionnaire for the effectiveness online learning using e-learning can be seen in Table 1.

Table 1. Questionnaire Effectiveness E-Learning

Variabel	Indicators	Items	Total
Online Learning Using E-Learning: Moodle, Schoology, Edmodo, Google Classroom, Ms. Teams, and WhatssApp Group	E-learning that is widely used on Indonesian campuses	1, 3, 6, 10, 12	5
	E-learning that is easy to use when learning online	2, 4, 9, 11, 13	5
	E-learning that has complete features, making it easier for students to understand the material	5, 7, 8, 14, 17	5
	E-learning that does not consume a lot of internet quota (economical)	15, 16, 18, 19, 20	5

3. RESULT AND DISCUSSION

Result

Effectiveness of the use of e-learning was measured using a questionnaire or questionnaire distributed to several students on islands in Indonesia with the results can be seen in Table 2.

Table 2. Data on the Use of E-learning

Island	WhatsApp Group (%)	Google Classroom (%)	Microsoft Teams (%)	Schoology (%)	Edmodo (%)	Moodle (%)
Sumatra	21	22	8	2	2	45
Java	23	31	15	3	3	25
Kalimantan	17	26	0	0	0	57
Sulawesi	18	28	1	1	1	51
Papua	27	31	0	2	0	40

Table 2 shows data on the percentage of e-learning usage used in online learning at universities spread across islands in Indonesia. E-learning used for learning includes WhatsApp Group, Google Classroom, Microsoft Teams, Schoology, Edmodo, and Moodle. From Table 2, it can also be seen the differences in the use of e-learning. Universities on the island of Sumatra tend to be stable in the use of e-learning, in the sense that several universities on the island of Sumatra do not depend on one e-learning alone. Likewise, universities on the island of Java are also flexible in the use of e-learning. Several universities on the island of Java adapt their courses to the e-learning used, thus making learning during the pandemic more attractive to students. It is different from universities on the island of Kalimantan which only use a few e-learning. The use of e-learning is still limited which is adapted to the environmental conditions at the university. Likewise, universities on the islands of Sulawesi and Papua can only use a few e-learning.

Table 2 also shows the most widely used e-learning in several universities in Indonesia. From the table, it can be seen that the most widely used e-learning is Moodle e-learning, followed by Google Classroom, WhatsApp Group, Ms. Teams, Schoology, and Edmodo. The use of Moodle e-learning dominates in universities in eastern and central Indonesia. From the results of the study, it was also found that there are several universities in eastern and central Indonesia using Moodle e-learning as the campus's main e-learning. Online learning that completely online require a stable internet connection so that it can affect the quality of learning, and the proper use of e-learning will determine the achievement of effective learning. From the results of the analysis, e-learning WhatsApp Group, Google Classroom, Microsoft Teams, Schoology, Edmodo, and Moodle are very axis e-learning and are widely used in Indonesia. Each of these e-learning has advantages and disadvantages and different features. In this case, the creativity and foresight of a lecturer or instructor in determining the use of e-learning are highly demanded. A lecturer is required to be technology literate and good at seeing situations and conditions so that learning can run well and effectively.

Mostly E-Learning Used

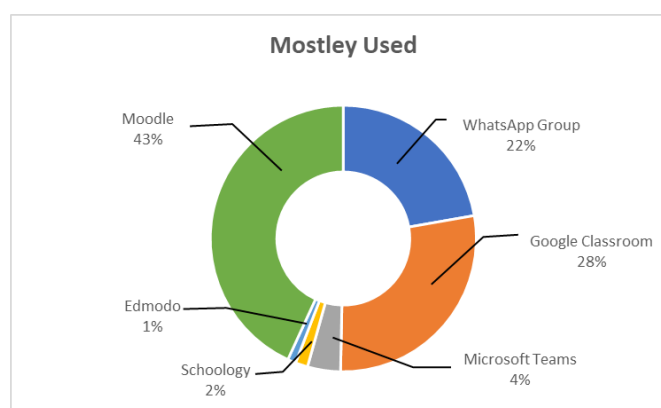


Figure 1. Data of Used Mostly E-Learning

Figure 1 shows that e-learning is the most widely used in Indonesia is Moodle, followed by Google Classroom, WhatsApp Group, Microsoft Teams, Schoology, one, and Edmodo. From the results of the analysis, Moodle provides the convenience of template techniques that can be designed, designed, and modified according to their wishes and needs, this is done to make it easier and attract students' attention to keep the spirit of learning during a pandemic condition (Herbimo, 2020; Sara et al., 2020). Indonesia is divided into three parts, namely Western Indonesia, Central Indonesia, and Eastern Indonesia. Here the researcher analyzes the use of e-learning in Indonesian universities which is divided by state, the results of the research data is presented in Figure 2.

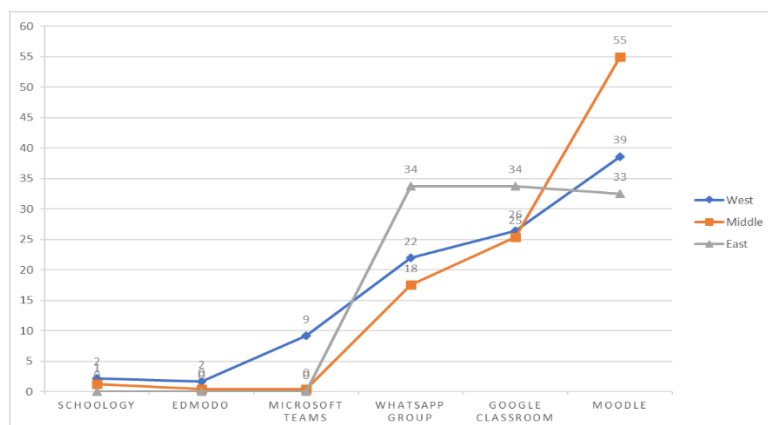


Figure 2. Mostly Used E-Learning by Region of Indonesia

Figure 2 shows that Western Indonesia is more flexible in the use of e-learning. So that universities in western Indonesia can adjust the use of e-learning that can support the lecture process. Western Indonesia can use all existing e-learning such as WA Group, Google Classroom, Ms. Teams, Schoology, Edmodo, and Moodle. Unlike the other two parts of Indonesia, which can only use some e-learning. Universities in Central and Eastern Indonesia tend to use e-learning Moodle for learning. This is because e-learning Moodle has complete features and an attractive user interface so that it can attract students' interest and attention to attend learning. However, in terms of ease of e-learning, Moodle tends to fall into the category that is difficult to use, because to use e-learning Moodle lecturers must design classes in such a way that learning can attract students' attention and run well. From the results of the analysis, why does Western Indonesia can use some e-learning according to their needs this is because, in the western part of Indonesia, it is enough to have a good or stable internet connection from Central and Eastern Indonesia. This internet connection greatly affects the use of e-learning (Taslim et al., 2017). In contrast to other parts of Indonesia, which are still less stable in internet connections. If the internet connection is bad, the information provided will not reach students.

E-Learning Easy To Use

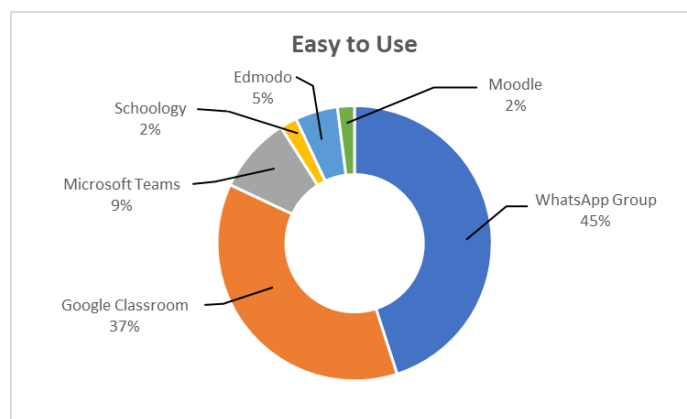


Figure 3. Data of E-Learning is Easy to Use

Figure 3 shows that the use of WhatsApp Groups can make it easier for students to carry out online learning. This is followed by the use of Google Classroom, Microsoft Teams, Edmodo, Schoology, and Moodle. From the results of the analysis, the use of WhatsApp Groups can make it easier for students because the application can be directly connected or incorporated with teaching lecturers. Questions from students were immediately responded to during learning so that they were more effective and easily understood by students. In addition, students are more active in solving practice questions. Then the material given by the lecturer in the form of PowerPoint slides, videos, or in the form of notes can be opened directly in the WA Group. Students can discuss with other students if some questions have not been resolved and have not been answered by the lecturer and the material and discussion materials can be saved directly by students so that they can complete the practice questions while repeating and reading the material (Yensy, 2020).

E-Learning with Complete Features

The features of e-learning can make it easier for lecturers to provide and deliver lecture materials so that the complete features of e-learning greatly affect the quality of teaching materials, achievement, and success of learning. Table 3 shows the student opinions regarding the quality of teaching materials provided by lecturers during online learning using some e-learning.

Table 3. Student Opinion Regarding the Quality of Teaching Materials

Category	Percentage					
	WhatsApp Group (%)	Google Classroom (%)	Microsoft Teams (%)	Schoology (%)	Edmodo (%)	Moodle (%)
Not Qualified	20.4	5.5	8.4	6.4	8.2	1.5
Less Qualified	60.4	10.4	17.6	16.6	25.8	23.9
Quite Qualified	10.2	30.8	43.7	50.5	40.6	64.2
Very Qualified	9	53.3	30.3	26.5	25.4	10.4

Table 3 shows that the lecturer when delivering teaching materials by using e-learning is included in the category of quite high quality. The quality of teaching materials delivered depends on the creativity and innovation of a lecturer in designing teaching materials and then combined with the right use of e-learning, so that online learning become more fun and comfortable, then students feel that there is no difference between online learning and offline learning. Figure 4 is research data from several e-learning that have complete features.

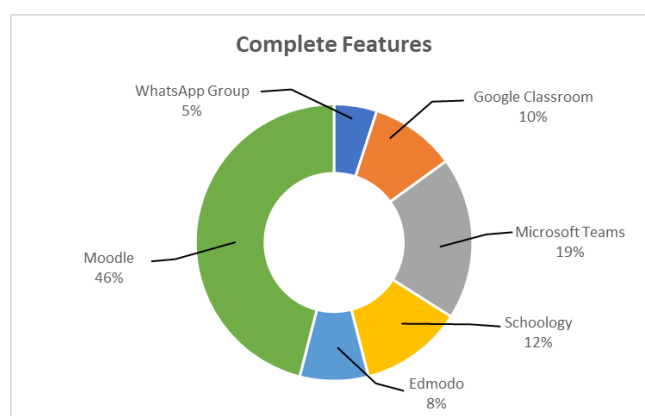


Figure 4. Data E-Learning with Complete Features

Figure 4 shows that Moodle is an e-learning that has complete features compared to other e-learning. Because in this e-learning Moodle has a user interface that can be modified and designed in such a way that it can attract the attention of students. The features in the e-learning moodle are assignments, chat, forums, quizzes, surveys, and languages that we can customize. In addition, e-learning moodle can also be combined or connected to other digital platforms such as zoom meetings and big buttons. Several universities in Indonesia use e-learning Moodle as their e-learning main campus. This is because the features in e-learning Moodle have the completeness that can be adjusted to the wishes of the creator (Farry & Haskari, 2012; Ilmadi et al., 2020).

Economical E-Learning

Online learning will use a lot of quotas. Quotas are used to keep students online to be able to access material provided by lecturers. The use of large quotas can burden students in taking online learning. Some students use quotas as an excuse not to take online learning. Figure 5 shows the data on student quota usage in one month to take online learning.

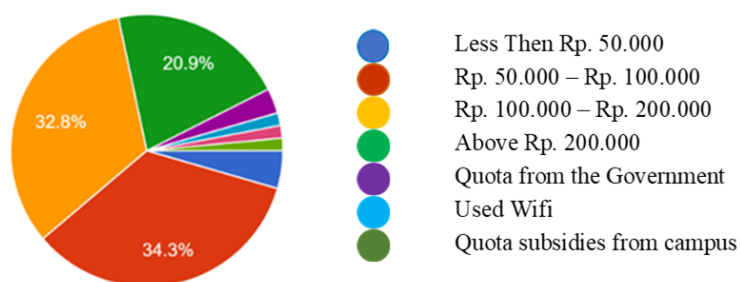


Figure 5. Data on Student Internet Quota Usage

Figure 5 shows that the average use of student quota in 1 month is around Rp. 50,000 – Rp. 200,000. The use of the quota is quite expensive. This is because students must stay online and attend learning using real-time applications such as zoom meetings, google meet, etc. To use the conference application, of course, a lot of quotas are used. Therefore, the use of e-learning that does not use a lot of quotas needs to be considered by lecturers.

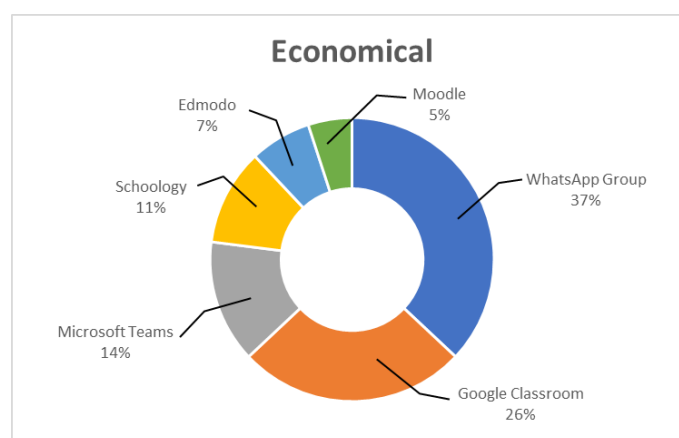


Figure 6. Data Economical E-Learning

Figure 6 shows that e-learning is the most economical WhatsApp Group, followed by Edmodo, Google Classroom, Schoology, Microsoft Teams, and Moodle. From the results of the analysis, WhatsApp Group is the most economical application because it does not use a lot of quotas. WhatsApp Group does not have many features, the only feature that can be used are chat. Taking quizzes, attendance, or exams in WhatsApp groups is quite difficult to do. E-learning that uses the most quota is Moodle, this is because to access Moodle, you must use a browser to open it. However, by using a lot of quotas, the existing features are complete and can make it easier for lecturers and students to conduct learning. E-learning is said to be effective if students and lecturers feel comfortable and easy to deliver material so that online and offline learning make no difference.

Discussion

In the application of education in Indonesia, online learning is not a new concept. To promote the adoption of offline learning, several educational institutions have performed online learning. However, online learning has recently been implemented at all levels and educational institutions in Indonesia (Anugrahana, 2020; Fitriyani et al., 2020). During the Covid-19 pandemic, so many types of e-learning platforms were offered. Each platform brings its advantages and disadvantages, which of course all aim to facilitate the needs of lecturers in the learning process, share resources sharing teaching materials, and learning activities learning activities such as discussions, tests, chat. This application can also be accessed either through computers, laptops, tablets, even smartphones, or Android. There are various types of e-learning platforms used, namely in the form of web-based learning and mobile-based learning. Apart from the web and mobile-based learning, social media and video conferencing are also used in learning.

The effectiveness of the use of e-learning during the pandemic needs to be considered so that the learning process can run well. E-learning is said to be effective if users and creators feel comfortable and easy to use. The most widely used e-learning in Indonesia is WhatsApp Group, Google Classroom, Ms. Teams, Schoology, Edmodo, and Moodle. The indicators used to see e-learning as effective are 1) Widely used, 2) Easy to use, 3) Full-featured, and 4) Economical. From the results of the study, it was found that Moodle is the most effective e-

learning to use during this pandemic (Garbin et al., 2012; Gogan et al., 2015; Sibuea et al., 2020). This happens because Moodle has more complete facilities and features, so its use is more flexible in utilizing various learning resources. In addition, Moodle is better known at the university level throughout Indonesia and several universities make Moodle the main e-learning.

The use of e-learning in every university in Indonesia is different. The selection of e-learning is adjusted to the needs and completeness of existing facilities for students and lecturers. The results of the study show that there are differences in e-learning used in every university in Indonesia. Universities in western Indonesia tend to be more flexible in the use of e-learning. Universities in western Indonesia are not only fixated on one e-learning, these universities can use some e-learning that can be adapted to the needs of lecturers. This is supported because universities in the western part of Indonesia are helped by the existence of a fairly stable internet connection compared to Central and Eastern Indonesia. In addition, universities in western Indonesia also have complete supporting facilities for online learning. Unlike the case with universities in Central and Eastern Indonesia which can only rely on a few e-learning. Universities in Central and Eastern Indonesia tend to use e-learning moodle, this is because e-learning moodle has complete and attractive facilities to be used in learning. In addition, due to the relatively unstable internet connection in Central and Eastern Indonesia, universities in these areas can only use a few e-learning, unlike universities in western Indonesia.

The results of the study show that e-learning that is often used for lectures during the Covid-19 pandemic is WhatsApp Group, Google Classroom, Ms. Teams, Schoology, Edmodo, and Moodle. The five e-learning have advantages and disadvantages in terms of features, facilities, and usage. From the research results, Moodle e-learning is the most widely used e-learning. This is because Moodle has complete and attractive features and facilities so that e-learning is widely used. While the easiest to use e-learning is WhatsApp group, this is because the use of the application is not too difficult and very easy to use (Jana et al., 2022).

From the results of the analysis that researchers did, Moodle is very effective e-learning to use. The use of Moodle in optimizing learning, especially where the pandemic is very effectively used, during the learning, students are enthusiastic in receiving the material and practicing it. This is in line with research conducted by (Ramkissoon et al., 2020; Sumardi et al., 2021) which shows that Moodle is an e-learning that is easy to use during this pandemic and then moodle is the most complete, and interactive. Moodle has interesting features that can be used to measure learning achievement. In addition, this e-learning is very interesting to use because every element in the e-learning can be designed by us according to the wishes that can attract the attention and enthusiasm of students to attend learning. However, it should be noted that Moodle has limitations, such as when there are several locations that are not connected to the internet, it will be difficult to access, and in order to implement Moodle to its full potential, student discipline in following the learning process, which tends to be carried out independently, is required. The contribution of this research is to show that e-learning moodle is an effective e-learning to be used during online learning in Indonesia. Suggestions for further research are to increase the research sample and add variables to student learning outcomes during the pandemic.

4. CONCLUSION

The teaching and learning process must continue to be carried out considering the pandemic is still ongoing now. The use of e-learning during the pandemic such as Moodle, Google Classroom, Microsoft Teams, Schoology, and Edmodo had a positive impact on students and was effective in improving the quality of learning during the COVID-19 pandemic. Lecturers and students are becoming increasingly technology literate while still implementing the health protocols recommended by the Indonesian government. Signal constraints that are less stable and wasteful of quotas during the implementation of online learning are one of the challenges faced. To deal with this, the selection and combination of done e-learning can minimize these obstacles while maintaining quality and not reducing the essence of the online learning that are carried out. The use of appropriate learning media will be able to increase student interest, motivation and enthusiasm for learning. In addition, online learning must be made as good as possible, so that it can lead to the perception that there is no significant difference between online learning and offline learning.

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