

THE EFFECTIVENESS OF ONLINE LEARNING FOR MATHEMATICS STUDENTS DURING THE COVID-19 PANDEMIC (CASE STUDY - MATHEMATICS STUDY PROGRAM, PAMULANG UNIVERSITY)

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Abstract

The spread of the Covid-19 virus globally continues to grow. The impact felt by Indonesia in addition to the many positive cases, economic, social and educational system problems. The learning process that has been carried out face-to-face has become undisturbed, so that the learning process changes its function to online learning. The purpose of this research is to obtain information on how to describe the implementation process of learning for students of the Pamulang University Mathematics Study Program during the Covid-19 pandemic as an effort for Higher Education to stop and break the chain of spreading covid-19. The research subjects were students of the Mathematics Study Program. Data processing was carried out by interviewing through cloud meetings and questionnaire response sheets using the google format. Interviews and questionnaire sheets were conducted with questions that were compiled and developed with related literature. Miles & Huberman's interactive analysis techniques were used in this study. This study obtained the results, namely, (1) students already have basic learning facilities such as laptops, computers, android-based mobile phones and internet networks; (2) The learning process has not been maximally carried out yet; (3) Lack of supervision from both lecturers and parents during the lecture or learning process; (4) The online learning process has the advantage of flexibility in time, encourages and trains students to study independently.

Keywords: *Online learning, Learning Effectiveness, Covid-19 Pandemic.*

Abstract

Penyebaran virus covid-19 secara global masih terus bertambah. Dampak yang dirasakan Indonesia selain banyaknya kasus positif, masalah ekonomi, sosial dan sistem pendidikan. Proses pembelajaran yang selama ini dilakukan secara tatap muka menjadi terganggu, sehingga proses pembelajaran berubah fungsi menjadi pembelajaran daring(online). Adapun penelitian ini memiliki tujuan untuk memperoleh informasi bagaimana gambaran proses pelaksanaan pembelajaran daring untuk mahasiswa Prodi Matematika Universitas Pamulang selama pandemi covid-19 sebagai upaya Perguruan Tinggi untuk menekan dan memutus rantai penyebaran covid-19. Subjek penelitian adalah mahasiswa Prodi Matematika. Proses pengumpulan data dilakukan dengan wawancara melalui zoom cloud meeting dan lembar angket respon menggunakan google format. Wawancara dan lembar angket dilakukan terstruktur dengan pertanyaan yang disusun serta dikembangkan dengan literatur terkait. Teknik analisis interaktif Miles & Huberman yang digunakan dalam penelitian ini. Penelitian ini memperoleh hasil yaitu, (1) Mahasiswa sudah mempunyai fasilitas-fasilitas dasar pembelajaran daring seperti, laptop, komputer, handphone berbasis android dan jaringan internet; (2) Proses pembelajaran daring yang dilakukan belum maksimal sepenuhnya; (3) Kurangnya pengawasan baik dari dosen dan orang tua saat proses perkuliahan atau pembelajaran; (4) Proses pembelajaran daring memiliki keuntungan perihal fleksibilitas waktu, mendorong dan melatih mahasiswa untuk belajar secara mandiri.

Kata kunci: *Pembelajaran daring, Efektivitas Pembelajaran, Pandemi Covid-19*

INTRODUCTION

In Desember 2019 the world is shocked by an invisible viral epidemic or pandemic. The virus has spread widely to more than 215 countries in the world, including Indonesian. On February 11, 2020, the World Health Organization (WHO) officially announced the name of a disease, where the disease is caused by a new type of corona virus, the virus is named coronavirus 2019 (Covid-19) (Zu et al. 2020). The virus is part of the coronavirus (crowned virus) family that

can attack animals as well as humans. When humans are said to be positive for Covid-19, usually the virus attacks the respiratory tract. Covid-19 it self is a new type of coronavirus that was discovered in Wuhan, Hubei Province, China in December 2019 and the transmission is still unknown in the fish market in Wuhan(Rothan and Byraredy 2020). The Covid-19 virus spreads and spreads very quickly in almost all countries, in just a few months. The spread that is so fast and massive is worrying all people in the world, including Indonesian.

The number of positive cases of Covid-19 in the world is getting higher day by day. Recently, the world health organization *World Health Organization*(WHO) informed about the dangers of the virus and raised the level of preparedness for the risk of transmission from a global scale to a maximum or a very high level(CNNIndonesia, 2020). The covid-19 virus itself is known to have been found on almost every continent, except Antarctica. In Indonesia, the number of positive infected cases continues to increase, the government continues to extend the PSBB to suppress and break the chain of transmission of the Covid-19 case. Some of the ways the government has taken include prohibiting residents from gathering, large-scale social restrictions (PSBB), maintaining social distance (social distensing), becoming physical contact (physical distensing), washing hands, and wearing masks. The impact of the current pandemic has changed the process of social interaction in society to carry out daily activities, including impacting the world of education, including universities. Based on (Kemendikbud, Indonesia 2020) it requires universities to carry out the lecture or learning process which has been face-to-face (face to face) which has been transferred to function or replaced by an online learning process.

It is hoped that the online lecture or learning process can be carried out by universities (Firman, F., & Rahayu 2020) Online learning actually has its own challenges, strengths, weaknesses and barriers(Jamaluddin et al. 2020). *World Health Organisation* (WHO) has appealed to stop activities that can cause crowds or bring large crowds. The face-to-face learning that has been done so far is to gather a lot of students in the class and the interaction process with one another so that the transmission process will be faster. According to (Firman, F., & Rahayu 2020) lectures should be carried out using other strategies, so as to prevent the process of physical interaction between lecturers and students or students against other students. The online learning process is expected to be able to assist lecturers and students in carrying out lectures so that the educational process continues as it should, even in the state of the Covid-19 pandemic.

The form of learning that is an alternative in helping the learning process in the midst of the Covid-19 pandemic is online learning. According to(Kuntarto. E 2017) online learning is online learning with the help of the internet so that it is able to meet lecturers and students virtually. In recent years, online learning has become a demand in the world of education (He, Xu, and Kruck 2014). In the era of globalization, revolution 4.0, online learning is needed to face the challenges of the Vuca era today (Pangondian R. A., Santosa, and Nugroho 2019). Online learning with the help of internet networks makes the learning interaction process emerge, has advantages in terms of

connectivity, accessibility, flexibility (Moore, J. L., Dickson-Deane, C., & Galyen 2011). In line with that (Zhang et al. 2004) said that the use of technology and communication with the help of the internet will be able to change the way of conveying knowledge (material) to students and become another alternative in the process of updating the learning system which has been carried out face-to-face.

According to (Gikas, J., & Grant 2013) the process of implementing lectures or online learning requires building tools such as laptops, computers, android-based smartphones, and so on. The use of these devices is to access and search for lecture or learning information anytime and anywhere. In addition to these building tools, various virtual class media can also be used such as the use of Google Classroom, Google Form Google Meet, Edmodo, and Schoology (Enriquez 2014);(Sicat 2015);(Iftakhar 2016) and the WhatsApp messaging application that we usually use(So 2016). Another alternative in the online learning process can also be done through the help of social media such as Facebook and Instagram (Kumar, V., & Nanda, 2018). This research aims to obtain information on how to describe the process of implementing online learning for students of the pamulang university mathematics study program during the Covid-19 pandemic as an attempt by universities to suppress and break the chain of the spread of covid-19.

METHODS

Type of research used in this research is qualitative research with an inductive approach. Exploratory research is research that aims to explore broad information about the causes or things that influence the occurrence of something(Arikunto, 2006). The purpose of this study was to obtain information on how to describe online learning held by the pamulang university mathematics study program as an effort by the campus in suppressing the chain of transmission of the Covid-19 virus in the college environment. As for online learning, what is meant is the learning process using media that can be accessed using the internet, while the media used so far by the pamulang university undergraduate mathematics study program are moodle and zoom cloud meeting. The research was carried out first by conducting a survey of students on learning using online. The survey was carried out by sending a questionnaire using the google form which was distributed through the WhattApp. There were 50 students who responded to a questionnaire given using google form.

The subjects in this study were students of the pamulang university mathematics study program who had carried out the learning process online, and then were divided based on the response group of the research subject. After obtaining the research subjects, namely 12 mathematics study program students consisting of 5 students on semester 1, 4 students on semester 3 and 3 students on semester 5. Of the 12 subjects, 7 people were female and 5 were male. The data collection technique used is through a response questionnaire (google form) and the interview

process via WhattApp, and zoom meetings. As for the question items given to students (research subjects) are as follows:

- 1) The facilities and infrastructure owned by students to carry out online learning
- 2) Difficulties experienced by students in implementing online learning
- 3) Student responses regarding the effectiveness of online learning
- 4) Implementation of online learning in breaking the chain of spreading Covid-19 in universities.

The data analysis technique used in this study is to use the analysis model of Miles & Huberman (1994) which consists of three stages, namely the data reduction stage, the data presentation stage, and the conclusion drawing stage. Data analysis carried out at the time of research was to collect all information related to the needs of the research obtained from the results of interviews and to group the data.

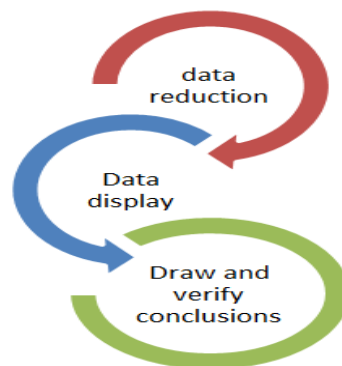


Figure 1: *Stages Of Research Data Analysis*

Data analysis carried out at the time of the study was to collect all information related to the needs of the study obtained from interviews, response questionnaires and grouping the data. Anything that is done at the data display stage is to expose the data obtained and discard unnecessary data information. The last stage is drawing conclusions on the phenomena obtained from the research process.

RESULTS AND DISCUSSION

The use of internet access can no longer be separated from our lives in the Vuca era today. The spread of information so fast requires that every individual has a smartphone, leptop and so on. In 2018, around 62.41% of Indonesia's population owned a cell phone and 20.05% of households had a computer at home (BPS, 2019). Excessive use of internet access will also hinder the process of our interaction as social creatures in society. According to (Rahadian, D, 2017) with the rapid

development of information and communication technology, there has been a significant increase in internet use in Indonesia. This data is relevant to the results of research which shows that even though there are students who do not have laptops as a whole, almost all students already have smartphones.

The demands of development in the era of revolution 4.0 require that the world of education, including universities, switch functions which previously used a face-to-face learning system to an online learning system. The online learning process requires supporting devices for the learning process including leptops, smartphones, tablets, computers, and so on. learning outcomes in online learning can be increased with the use of smartphones and Studentleptops (Anggrawan, A, 2019). The use of smartphones and leptops is expected to help students in the online learning process. The use of supporting facilities used by students of the Pamulang University mathematics study program is shown in figure 2 below.

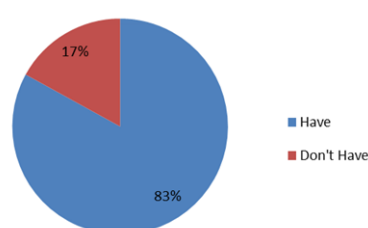


Figure 2. *Online Learning Facilities*

The Figure 2 above shows that 83% of students already have online learning support facilities such as smartphones, leptops, tablets and so on. although there are 17% of students who do not have these supporting facilities. With the help of using leptops, smartphones and so on, students are expected to be able to find references and literature more freely, so that students' literacy skills continue to increase. As for other research that has been done on the ability of smartphones and leptops in accessing information on the internet, it can help students to attend lectures or online learning (Kay and Lauricella 2011); (Gikas, J., and Grant 2013); (Chan, N. N., Walker, C., & Gleaves 2015).

In addition to the benefits of using leptops and smartphones, several other virtual applications used by the Mathematics Study Program of Pamulang University are zoom meetings and Moodle. Zoom meeting is expected to help the face-to-face lecture process with students even though it is virtual anywhere and anytime. The use of zoom meetings in online learning has advantages so that students and lecturers can interact directly (virtual), but it is less effective because it uses a large internet quota (Naserly, MK, 2020).

In addition to zoom meetings, the use of the Moodle application is also used by the Pamulang University Mathematics Study Program which is integrated into the e-learning of each student and lecturer, so that lecturers and students can integrate, discuss, send assignments and so

on. Moodle is an application or software that can be used by users for free (open source) and can make modifications or changes according to the needs of its users, with various features such as flash, audio or video. Even though Moodle is free (open source), the device or software still has copyright and users can still make modifications (Amiroh, 2012). The use of moodle can increase students' positive interest in attending lectures and students play an active role in discussions to provide their respective arguments and opinions (Amandu, M, et al 2013). Moodle is a learning tool with an approach that matches the modern learning process in learning (Hölbl, M. & Welzer, 2011). Using the Moodle application in education proves that distance and time are not a barrier to the learning process (Belina, E. 2013). During the Covid-19 pandemic, the teaching team was able to be helped by the distance learning process using e-learning (Moodle) based applications (Syamsul, R 2019). With the use of the zoom meeting and moodle applications, the online learning process of the Pamulang University mathematics study program is still ineffective, as seen in figure 3 below.

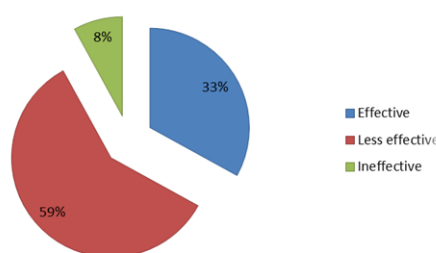


Figure 3. Learning Effectiveness during the Covid pandemic 19

Figure 3 shows that 59% of students responded to the less effectiveness of online learning during the covid-19 pandemic. Here are the reasons for the pamulang university mathematics study program students at the time of the interview via zoom cloud meet: (a) constrained by weak internet access; (b) constrained in understanding the material, Moreover, mathematical material which is abstract in nature, requires an explanation to be able to understand the material, (c) the lecture system where the lecturer only provides material, but some do not comment on the results of the answers given; (d) but for other materials deemed effective ”.

Furthermore, the availability of internet services is a challenge in itself in online learning, there are some students accessing the internet using Wifi and cellular services. When the pamulang university mathematics study program asked for a circular from the ministry of education and culture for the online learning process to be implemented, some students returned to their hometowns because they wanted to avoid the spread of the Covid-19 virus in the city which continued to grow. Internet access in the hometown is also not supportive due to weak internet service access. The weak internet becomes an obstacle in the online learning process, students become less aware of information and instructions from lecturers regarding the learning process or lectures (Astuti, P., & Febrian 2019).

Apart from being constrained by the internet network, the challenge of financing (internet quota) was also faced by students at the beginning of implementing the online learning process policy. After the implementation of the Ministry of Education and Culture's free quota policy, students can be helped in the learning process which previously consumed a large internet quota. Video conferences (zoom meetings) in the online learning process are quite expensive (Naserly, NK 2020).

Based on (Kemendikbud, 3, 2020) it requires universities to carry out the lecture or learning process which has been face-to-face (face to face) which has been transferred to function or replaced by an online learning process. By following up on this circular, the mathematics study program implements an online learning system so that it can suppress and break the covid-19 transmission chain in universities. The results of the response questionnaire (google form) in figure 3 show that online learning at the pamulang university mathematics study program can be effective in breaking the covid-19 transmission chain so that students do not gather in class, canteen, and other places around the pamulang university.

CONCLUSION

The steps taken by the pamulang university mathematics study program in suppressing and breaking the covid-19 transmission chain in higher education are implementing an online learning system as a solution so that the learning process continues amid the Covid-19 pandemic based on a Ministry of Education and Culture circular. The results of the study indicate that:

1. Pamulang university mathematics study program students have the facilities and infrastructure to form an online learning process.
2. Online learning is still ineffective due to several student reasons.
3. In breaking the chain of covid-19 transmission, online learning is effective because there is no (direct) interaction between lecturers and students and students do not gather in class, canteen and other places.
4. Online learning can make students learn independently, however, students are not well supervised during the learning process.

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