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Analysis of Online Learning Impact of the Covid-19 Pandemic from the Perspective of Biology Educators

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ABSTRACT

The physical distancing policy implemented by the government prohibits physical meetings to prevent the spread of the Covid-19 virus including all activities in the educational process. The online learning system is implemented to facilitate teaching and learning activities without physical meetings between lecturers and students. This study aims to analyze online learning from the perspective of the lecturers biology education departement in courses based on pedagogical competences and scientific work skills or practicum activity. Surveys and interviews were used to obtain data with a quantitative approach. The results of the study provide information that:1) online learning still allows interactive activities in class; 2) online learning platforms are used in an integrated by lecturers; 3) WhatsApp Zoom and Google Meet are the most widely used platforms because they support synchronous and asynchronous learning; 4) practical activities are carried out using materials available at students' homes and with the help of practical tutorial videos from lecturers and virtual laboratories. Through the full online learning system for even one semester the lecturers of the biology education departement have carried out the learning process well by always providing feedback and the interactive learning between students and lecturers online with the help of various learning platforms. This study provides information about the information of full online leraning at university.

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INTRODUCTION

Since the discovery of the first case of Covid-19 in Indonesia in early March 2020 in the area around the capital city of Jakarta, the spread of the virus has accelerated rapidly (Amirullah & Maesaroh, 2020). In mid-March, a decision was issued by the Minister of Education of the Republic of Indonesia and the Government of DKI Jakarta regarding the prohibition of physical gathering activities (Maesaroh, 2021). This includes all activities in the educational process, namely classroom learning activities, laboratory practicums, field lectures, educational seminars and other activities. Referring to the policy, the process in

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the world of education "suddenly" must be done online. This is something that must be done by all actors in the educational process, without waiting for the readiness of all supporting aspects.

Online learning, also known as e-learning, is a learning process that utilizes internet-based technology in its implementa-tion (Dimyat, *et al.*, 2018). The online learning system is implemented to assist or facilitate teaching and learning activities without any physical meeting between lecturers and students. However, in some online activities, it is very unfortunate when a school which is actually a place to gain knowledge, becomes a place of assignment only during the pandemic (Nguru, *et al,.* 2020). Ideally, learning activities on campus should provide meaningful experiences for students in developing their knowledge, attitudes, and skills (Amirullah & Maesaroh, 2020). On the other hand, a lecturer should have competencies that adapt to the times (Wati & Kamila, 2019). This study was conducted to analyze online learning from the perspective of lecturers who teach courses in the Biology Education study program. Information about the full implementation of online learning at the tertiary level is presented in the results of this study.

METHOD

Research Procedure

The method used in this research is a survey and interviews with a quantitative approach. The research sample is the lecturer of the biology education study program who teaches pedagogic-based courses and scientific work skills in the laboratory for the academic year 2020/2021 Universitas Muhammadiyah Prof. Dr. Hamka. A total of 13 lecturers were included in the research sample. They teach: 1) educational skills-based courses (Learning and education, Educational administration and supervision, Teaching competency development, Environmental education, Biology education seminars, Biology learning strategies, Biometry, and Environmental Impact Analysis (AMDAL); 2) courses based on laboratory scientific work skills (cell and molecular biology, genetics, laboratory management, vertebrates, and plant structure).

Data analysis

The research data was obtained using a survey instrument in the form of a questionnaire distributed through the help of the Google Form Platform in 2020. Interviews were carried out with several lecturers deemed necessary, with the aim of completing and strengthening the research data. There are 19 questions given to the research sample lecturers to collect data in the form of: characteristics of sources of information and information related to online learning (teaching methods, learning resources, scientific experimentation or practicum processes, obstacles in online learning, as well as advantages, weaknesses, and opportunities for online learning). The results of the research are presented in the form of tables and pictures of the results of the research which are then explained descriptively.

RESULTS AND DISCUSSION

The results of the analysis of online learning from the perspective of the lecturers of the biology education study program in subjects based on pedagogic skills and scientific work skills are presented as follows:

Characteristics of Research Data Sources

Research data sources regarding the online learning process come from lecturers with the following characteristics:

Table 1. Research Sample Identity Profile

No.	Description	Unit	Percentage
1.	Age Range	30-40 years	76.9 %
		41-50 years	-
		51-60 years	15.4 %
		61-70 years	7.7 %
2.	Academic Functional Position	Instructor	7.7 %
		Expert Assistant	84.6 %
		Lecturer	7.7 %
		Head Lecturer, Professor	-
3.	Course	Pedagogic	57.1 %
		Scientific Work Skills	42.9 %

The characteristics of the lecturers who became the research sample were based on the age range, academic functional position, and the subjects taught. Based on the age range, lecturers aged between 30-40 years make up the largest population with a total percentage of 76.8%. While 15.4% of lecturers are 51-60 years old and 7.7% are 61-70 years old. For the category of academic functional positions, the position of expert assistant makes up the highest percentage of 84.6%, while 7.7% of lecturers have academic positions of lector and teaching staff. Courses that develop pedagogic skills have a higher percentage, namely 57.1%, and 42.9% of lecturers teach subjects based on scientific work skills.

Online Learning Process Platform

Online learning that has been fully implemented in an even semester of the 2020/2021 academic year is carried out by lecturers on various platforms. The largest percentage of platform use, which is 38.5%, is carried out using the WhatsApp application in the learning process. In second place, 30.8% of lecturers use the Zoom application to teach. Third, the Google Meet application is used by 7.7% of lecturers. Next, the lecturers use a combination of several applications for the teaching and learning process. 7.7% of lecturers use Google Classroom and YouTube applications, 7.7% of other lecturers use a combination of WhatsApp, Zoom, Google meet, and YouTube applications. The use of WhatsApp and Google Meet by lecturers is balanced, which is 7.7%. The types of online learning process platforms used by lecturers are described as follows.

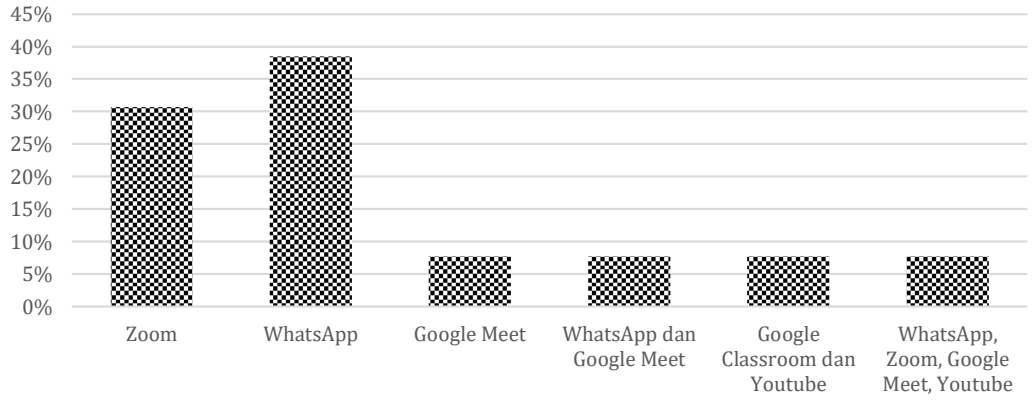

Figure 1. Platforms Used in Online Learning

Some platforms are more often used by lecturers in the learning process than others. There are several reasons when lecturers choose certain applications or platform assistance in their learning. The reasons lecturers choose to use the platform are: to be able to meet face to face (synchronus), to help deliver material clearly, practical and easy to use, to save quota, more stable connection, and free of charge.

Implementation of the Learning Process

In the implementation part of the learning process, data are described in the form of activities providing feedback from lecturers to student learning activities, interactions in the learning process, use of learning methods, and learning resources. Based on research data, it is known that 46.2% of lecturers always provide feedback on student activities in online learning. On the other hand, 46.2% of lecturers also stated that they sometimes provide feedback. 7.6% of lecturers stated that they had provided feedback to students in online learning. In the implementation of full online learning, all lecturers of the research sample stated that they were still able to carry out interactive learning with students with the aid of the learning platform.

The interactive activities during the online learning process were stated to be well implemented by 100% of the lecturers who were the research samples. The next section describes the use of learning methods by lecturers in online learning. During the online teaching and learning process, lecturers use several learning methods. The most widely used with a percentage of 15.4% are 1) discussion and question and answer; 2) lectures, questions and answers, and presentation assignments; and 3) lecture, discussion and question and answer methods. Other learning methods that have the same percentage, which is 7.7%, are: 1) lectures, discussions, and questions and answers; 2) lectures and discussions; 3) lectures, discussions, and practicums; 4) discussion, 5) discussion and question and answer; 6) discussion and demonstration, 7) 5E learning cycle method, and 8) discussion, lecture, and demonstration. The following figure shows data on the learning methods used by lecturers.

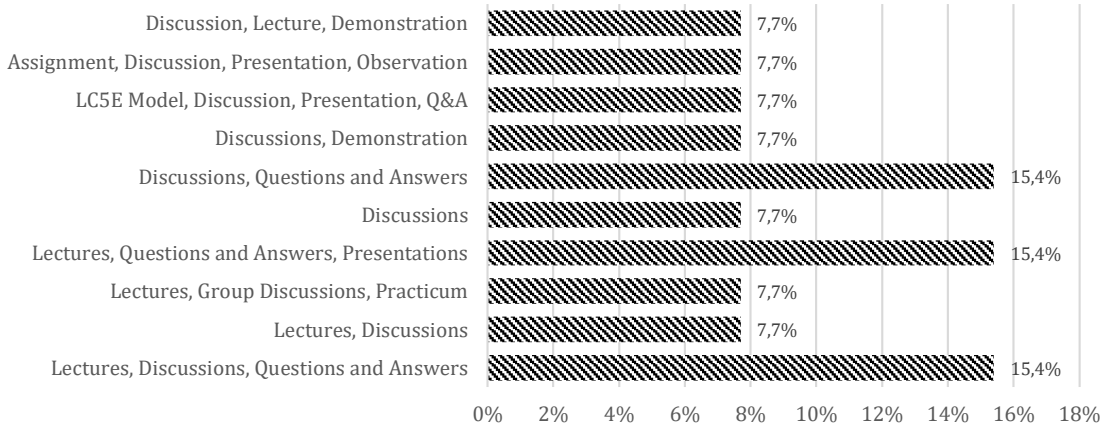

Figure 2. Obstacles in Evaluating the Learning Process

In the learning process that develops scientific work skills through laboratory activities, lecturers state that they experience obstacles, for example materials that cannot be done at home, although some of them can be modified by the lecturer so that students

achieve learning goals even though they are done online from home. Substitute activities that can be carried out are observation or direct observation, description and classification of specimens found around students or through pictures/photos, and learning videos. When carrying out the learning process that develops scientific work, students are still provided with a performance sheet or practicum module, then assigned to make an experimental/practical report.

Online Learning Advantages and Opportunities

Based on research data, the online learning process from the perspective of the Biology Education study program lecturer has the following advantages: 1) flexible, 2) efficient, 3) saving energy, time and cost, 4) learning can be repeated, 5) lecturers become creative in preparing learning media, 6) not constrained by distance, 8) students become more active, 9) become an alternative when the lecturer is out of town or unable to attend class.

The following is data on opportunities for holding online learning in the future based on the perspective of biology education lecturers:

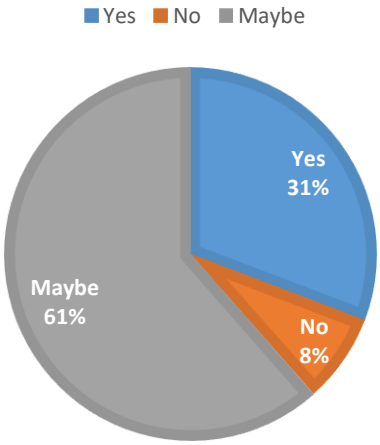

Figure 3. Future Online Learning Opportunities

The continuity of online learning in the future offers a glimmer of hope from the perspective of biology education lecturers, namely the availability of a special platform for learning for lecturers and students that is affordable, easy to use and stable, so as to prevent disruptions in the learning process. In addition, there is hope for funding to increase online learning facilities, such as internet quota assistance for students and lecturers.

Discussion

The lecturers who are the sources of research data are millennial lecturers. This is because most lecturers are in the age range of 30-40 years and have academic positions as expert assistants. Lecturers with a relatively younger age have characters that are easy to adapt to the education of the millennial generation. Today's education, or the so-called industrial revolution era 4.0, has the characteristics of mobile learning, not bound by time and place, with the help of internet networks and learning device gadgets (Setiawati & Mia, 2019).

There are more lecturers who teach pedagogical skills development courses than lecturers who teach courses that develop scientific work skills. In the compositional biology education study program, there are more education-based courses than biology courses. In essence, the two types of courses, both those based on pedagogics and scientific work skills, have their own challenges when taught online.

Based on the research results, it is known that there are three learning aid platforms that are most often used by lecturers, namely: WhatsApp, Zoom, and Google meet. This is in line with the research results by (Gazali, 2018) that WhatsApp social media has a good impact on increasing student learning motivation. On the other hand, lecturers use several platforms to help the online learning process. The use of one online learning application needs to be integrated with other applications, for example the use of Google classroom combined with

Youtube and Google forms as well as Google documents. The results of other studies provide information in the form of Google classroom being the majority platform used during online learning (Jamaluddin, *et al*., 2020). This activity is carried out to strengthen the interaction of the online learning process (Hidayat & Nurcahyanto, 2018). Other research also states that mobile learning can increase students' interest and creativity (Talakua & Elly, 2020).

It can be said that the implementation of the learning process, starting from providing feedback on student learning activities to interactive activities in online learning classes, was carried out very well. The smoothness of the online learning process is supported by the use of learning methods and learning resources used by lecturers. Modules or learning resources that are integrated with good learning methods can make the learning process effective (Kamalasari, *et al.*, 2019). Mobile worksheets based on scientific social issues can improve the students' biological scientific literacy (Arizen & Suhartini, 2020).

The results of the study stated that the biggest obstacle in evaluating the online learning process was that students' answers did not match the expectations of the lecturers. This is possible because the delivery of material in the learning process does not occur completely. Another cause could also be miscommunication between lecturers and students during the online learning process. The implementation of the evaluation results of student activities, both in the form of assignments and online exam answers, has the opportunity to produce similar results, or even plagiarism by students. (Susanto, *et al*., 2016).

Obstacles in carrying out experiments or practicum activities online include the existence of practicum materials that cannot be replaced, both in terms of equipment and materials. Practical activities during online learning are modified by doing simple practices using tools and materials available at home to achieve the same goal. Practical activities using tools and materials available in the surrounding environment are an alternative remote laboratory practice that can improve students' practical skills (Frima, *et al*., 2020). Online, practicum activities only hone fine motor skills through scientific experiment activities on the virtual laboratory website. Furthermore, online practicum activities are carried out using learning videos made by lecturers or by Youtubers. A study (Hikmat, *et al*., 2020) stated that online learning with the WhatsApp and Zoom platforms was not effective for practice-based courses and field lectures. The results of other studies state that practical activities can be carried out quite well through the Google Classroom application combined with other platforms (Suhada, *et al*., 2020).

The advantages of online learning that are flexible, efficient, save time and energy, can be listened to over and over again by students. One of the online learning platforms that can be listened to over and over again is the Youtube channel. Video blogs (Vlogs) with a STEM (Science, Technology, Engineering, and Mathematics) approach uploaded on the Youtube channel page are an alternative to online learning (Iqbal, *et al*., 2019). On the other hand, lecturers return to being learners to create creative and interactive learning media for their students. Other studies also state that online learning, apart from being considered to have a high level of accessibility, also provides benefits in terms of motivation, makes the material easier to understand, and increases college readiness (Saifuddin, 2017).

Online learning opportunities in the future can be implemented even better if they are supported by a special platform that is affordable, easy to use, and stable. Online learning or the use of e-learning is one solution when face-to-face interaction cannot be done much between teachers and students in the

classroom (Noor, *et al*., 2017). Other research results also state that face-to-face online learning (synchronous) and asynchronous online activities can improve learning interactions between students and lecturers in plant physiology courses (Rahmawati, 2018). In another part of the study, it was found that before the pandemic, almost part of the population of teachers in the study had routinely used the internet and learning software in the teaching and learning process in the classroom (Maesaroh *et al.*, 2020). In this final section, the researcher would like to suggest that the research be continued by focusing on the integration of several learning platforms in certain subjects.

CONCLUSION

Lecturers have good adaptability to changes in the surrounding environment. As educators, they have a role in shaping the character of the nation's successor. Through a full online learning system for an even semester, the Biology Education study program lecturers have carried out the learning process well by always providing feedback on the learning process (as much as 42.6%) and the fulfillment of interactive learning between students and lecturers online with the help of various learning platforms (100%).

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