Implementation of Online Learning During the Covid-19 Pandemic in Higher Education

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Implementation of Online Learning During the Covid-19 Pandemic in Higher Education

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***Abstract*— This study aims to analyze the effectiveness of the implementation of online learning during the Covid-19 pandemic in universities. This classroom action research refers to the model of Kemmis and McTaggart, in which there are four learning steps, which include planning, acting, observing, and reflecting. The implementation of the action was carried out in three cycles, whereas many as 18 students of the S1 Mechanical Engineering Education study program, Unesa became the research subjects. Data collection on student learning outcomes was carried out using test instruments. The data from the research results are then analyzed descriptively quantitatively based on predetermined success indicators. This study found that the implementation of effective, efficient, and innovative online learning can improve student learning outcomes during the Covid-19 pandemic. Based on the data on learning outcomes in the first cycle, it is known that only 44% or 8 of the 18 students achieved the complete criteria. These results then increased in the second cycle, where there were 61% or as many as 11 students who met the criteria. Meanwhile, in the third cycle student learning outcomes increased again, where 83% or 15 students out of 18 students reached the complete criteria.**

Keywords: online learning; classroom action research; Covid-19 pandemic; learning outcomes

I. INTRODUCTION

Coronavirus Disease 2019 or Covid-19 is a global and deadly pandemic with a very rapid spread rate [1]. Indonesia is no exception, until now positive cases of Covid-19 have been reported to have spread in 32 of 34 provinces in Indonesia [2]. Various sectors have felt the negative impact of this virus. Especially in the education sector, the increasing spread of the virus has prompted the Minister of Education and Culture to issue a Minister of Education and Culture Circular Number: 36962/MPK.A/ HK/2020. In the circular, it is explained that specifically affected areas are required to implement online learning from home [3]. In this case the Universitas Negeri Surabaya (UNESA) as one of the higher education institutions in Indonesia also continues to be committed to supporting this instruction. So that the learning process in the campus environment, especially the Mechanical Engineering Department, is still carried out well.

There have been many online learning platforms or Learning Management Systems (LMS) offered. Some of them are Rumah Belajar [4], Google Classroom [5], Vinesa, Canvas Moodle, Schoology, Edmodo, and others [6]. Of the several LMS platforms offered, Google Classroom is one of the most widely used and familiar platforms. Of the several LMS platforms offered, Google Classroom is one of the most commonly used platforms. Fauzan & Arifin (2019) suggest that Google Classroom is significant because the features offered are quite comprehensive and can be accessed for free [7]. This opinion is reinforced by Al-Maroof & Al-Emran (2018) which states that Google Classroom can simplify communication between students and teachers. Students can submit assignments according to the specified deadline. Meanwhile, teachers can also make assessments and provide personal comments so that students can revise their assignments [8].

But unfortunately, the implementation of LMS, which was carried out forcibly and continuously during the Covid-19 pandemic as at this time, would certainly have the potential to decrease student learning outcomes both from the affective [9], cognitive [10], and psychomotor domains [11]. his is possible because students will tend to get bored if the learning scheme is implemented monotonously or does not vary. Therefore, the main objective of this study is to analyze the effectiveness of the implementation of online learning during the Covid-19 pandemic in universities.

II. METHOD

This classroom action research refers to the model of Kemmis and McTaggart, there in this model, there are four steps of learning which include (1) planning; (2) action; (3) observation; and (4) reflection [12]. The classroom action research design referred to in this study, is depicted as a cycle that runs in a spiral, as shown in Figure 1.

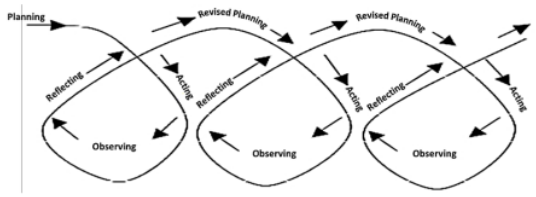

Fig. 1. Classroom action research spiral [13]

Based on Figure 1, it can be seen that the first step before the implementation of the classroom action research cycle is to identify problems by making preliminary observations. From the identification results, a plan is made in the form of methods, strategies, approaches, and learning techniques that are relevant to the problem at hand. Besides, it is also necessary to prepare teaching materials and assessment instruments which will be used to measure the achievement of learning targets [7]. The second step is to act. This step directs the lecturer to carry out the learning process according to the results of the initial identification of students who take the pump and compressor course. The material taught in each cycle is not the same, but the level of difficulty taught is the same. This aims to maintain the validity of the data obtained in each cycle [15]. The third step is observation, considering that during the Covid-19 pandemic, learning was carried out online, so observations were made through the distribution of a survey questionnaire for the implementation of learning. The purpose of distributing survey questionnaires was to analyze student achievement motivation and learning independence during online learning in each cycle [16].

The fourth step is reflection. This step is useful for analyzing and assessing the effectiveness of learning through the results of tests and survey questionnaires that have been distributed. From the results of these reflections, conclusions can be drawn regarding the positive and negative impacts obtained during the learning process. Furthermore, from these conclusions, an action plan is made for the implementation of the next cycle. The cycle will be declared terminated when the indicators of success have been achieved [17]. The research subjects were students of the Mechanical Engineering Department, FT Unesa, S1 Mechanical Engineering Education 2018 study program who were programming the pump and compressor course, totaling 18 students. Data collection on student learning outcomes was carried out using test instruments [15], [16]. he research data were then analyzed descriptively quantitatively based on the predetermined success indicators [20]. In this case, students can be declared complete if they get a value greater than 75, while classical completeness can be achieved if more than 75% of students have met the indicators of success [21].

III. RESULTS AND DISCUSSIONS

A. Results

Before implementing classroom action research, the researcher online first explains the learning scenario and the stages that will be carried out during the research implementation. Based on the results of discussions with several students, information was obtained that they had never previously used the Google Classroom platform as an alternative to implementing online learning. Even more so during the Covid-19 pandemic like today, students still have to get their right to study, even though it must be done over a long distance. Because of this, on the same occasion, the researchers held a discussion related to solution steps for the implementation of online learning using the google classroom platform. Furthermore, planning the time for the implementation of the action as well as selecting the class as the research subject. The google classroom platform was chosen as the Learning Management System (LMS) because it has quite complete facilities, starting from discussions, uploading teaching materials, and implementing multiple-choice and essay quizzes [22], [23]. Another reason is that all existing facilities on the Google Classroom platform can be accessed for free [24].

During the research, three tests must be done by students. Each test is carried out at the end of the cycle, which aims to measure the extent to which student learning outcomes have improved while implementing online learning [25]. Each cycle consists of two meetings. The form of online questions tested is in the way of multiple-choice of 25 items, where students are declared complete if they get a value> 75. Student learning outcomes in each cycle can be seen in Table 1, whereas when shown with a bar chart it is shown in Figure 2.

TABLE I. STUDENT LEARNING OUTCOMES

Category	Cycle I	Cycle II	Cycle III
Completed	44%	61%	83%
Not complete	56%	39%	17%

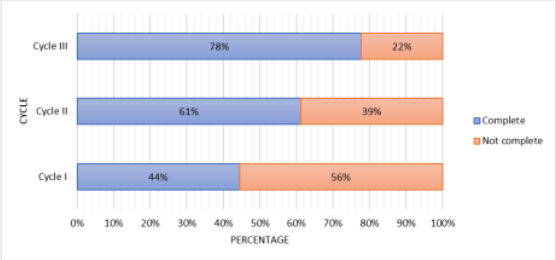

Fig. 2. Increased percentage of student learning outcomes

Based on Table 1 and Figure 2, it is known that the learning outcomes of students who fall into the complete category on

the first cycle test are 44%, or there are only 8 students out of 18 students. Cycle II increased to 61%. This means that out of 18 students, 11 students reached the completeness criteria. Then, in cycle III there is a consistent increase in student learning outcomes by 83%. This means that from 18 students, 15 students achieve the completeness criteria. Thus the classroom action research is declared to stop in cycle III because it has reached the predetermined classical completeness criteria.

B. Discussions

This research runs for thirteen cycles, where the indicators of success are achieved in the third cycle. In the first cycle, student learning completeness was still low, where only 44% or only 8 students scored at least 75. The low student scores in the first cycle were motivated by several reasons, including students who did not understand how to use the Google classroom platform. Among those who have difficulty accessing the given class code. Besides, some students also have not prepared the implementation of online learning properly so that an unstable internet network constrains many of them. I M Arsana et al. (2019) how that the implementation of the action in the first cycle has many shortcomings, but these will be reflected and corrected in the next cycle [26]. Thus, it is not surprising that the research was continued in the second cycle because the indicators of success achieved were still relatively low.

The acquisition of student learning completeness in the second cycle relatively increased, where the increase occurred by 17% when compared with student learning outcomes in the first cycle. In this cycle, there were 61% or 11 students who obtained a minimum score of 75, and the average score of students from 72.39 increased to 74.28. Even though there was an increase in learning outcomes, these results still did not meet the classical completeness criteria. This is because not all students can operate the Google Classroom platform properly. Besides, some students are still fixated on the concept of classroom learning, namely teaching lecturers and students paying attention. Therefore, student learning outcomes are still relatively low, where the material uploaded on the Google Classroom platform is not well studied. Hariyono & Soeryanto (2016) say that the learning process does not have to be dominant through lecturers as a source of knowledge, students will get more meaningful knowledge if they can learn based on what they need and learn independently [27]. Referring to the results obtained in the second cycle, it is stated that this research still has to be continued in the third cycle.

The acquisition of student learning completeness in the third cycle was better or, where the increase occurred by 22% when compared to the second cycle. In this cycle, there were 83% or 15 students who obtained a minimum score of 75, and on average, the students' scores increased from 74.28 to 78.44. The learning outcomes in this cycle have met the criteria for classical completeness, where classical completeness can be achieved, and the research is declared to be stopped if more than 75% of students have met the indicators of success. This cycle runs better because students have been carrying out online learning for four weeks so that by the fifth week, they have no difficulty and are getting used to using the Google Classroom platform. Besides that, the independence of students in learning is better so that it is easier for them to do the tests given. Kamil & Soeryanto (2015) emphasize that periodically teaching lecturers are required to check to understand, this is to minimize students who are still reluctant or embarrassed to ask both lecturers and friends who understand better [28]. The steps or stages from implementing the action from the first cycle to the third cycle can be explained as follows.

1) Action Cycle I

At the planning stage, several things were done by the researcher to prepare for the implementation of the action for the cycle I, which ran for two meetings. First, preparation begins with determining a Learning Management System (LMS) platform that suits student characteristics. From this determination, it was agreed that Google Classroom was considered the most suitable as the platform used in the implementation of online learning. Second, create online learning scenarios that can increase student motivation in learning. Third, prepare relevant learning resources in the form of an e-book for the pump and compressor course.

The second stage is an action. At the action stage, the learning process has begun to be carried out using the Google Classroom platform. The material taught is the basics of hydraulic pumps. The first meeting began with uploading material in the form of an e-book, which was then continued through discussion sessions that took advantage of the forum facilities on the Google Classroom platform. Until the second meeting, the number of students holding discussions was still relatively small. So when the test was carried out only 44% or only 8 students were in a complete category. Based on the results of observations in the third stage, several causes of low student learning outcomes were identified. The results show that low student learning outcomes are caused by many students who do not understand how to use the Google Classroom platform and are constrained by an unstable internet network.

The next stage is the reflection. This stage is carried out to break down and study the problems that exist in the first cycle based on the results of observations. From the results of the study, the best solution was formulated to be implemented in the second cycle. These solutions include: (1) making tutorials on the use of the Google Classroom platform for both lecturers and students [29]; (2) instructing students always to ensure that they have adequate data packages and are in locations that have relatively stable internet networks [30]; remind students that the material uploaded on the Google Classroom platform can be adequately studied, not only by downloading it; and (4) directing students always to ask questions that are not understood either through discussion forums on the Google Classroom platform or through Whatsapp messenger (WA) privately [7].

2) Action Cycle II

The second cycle of action was carried out in two meetings. In the second cycle, preparation for the implementation of learning is carried out based on the results of the reflection in the first cycle. First, identify weaknesses in the implementation of the first cycle of learning, then do better planning for the second cycle. Second, create online learning scenarios that can

increase student motivation in learning. Third, prepare more practical learning resources in the form of learning summaries arranged coherently and in detail in power-point media.

Furthermore, an action step is taken, in this step the learning is carried out through uploading teaching materials in the form of a summary of the working principles of hydraulic pumps arranged in power-points. After that, the discussion session was still carried out through forum facilities on the Google Classroom platform. When compared to the first cycle, in the second cycle the number of students who held discussions relatively increased even though there were still some students who did not participate. The result was that when the test was carried out, there were 61% or 11 students who entered the complete category. Based on these results, it can be stated that there was an increase in student learning outcomes in the second cycle. But unfortunately, these results still do not meet classical completeness so that the research still has to be continued in the third cycle. The results of the observations show that some students are still fixated on the concept of learning in class. So that student learning outcomes are still relatively low where the material uploaded on the Google Classroom platform is not well studied.

After that, proceed to the reflection step. Similar to the first cycle, the reflection step in the second cycle is also carried out to analyze and examine the problems that existed during the second cycle. From the results of this study, the best solution was compiled to be implemented in the third cycle. These solutions include: (1) implementing more innovative learning through video tutorials uploaded to the Youtube website; (2) instructing students to prepare themselves better before the learning process takes place; (3) remind students so that the material uploaded can be studied as well as possible; and (4) directing students to actively conduct discussions both through existing facilities on the Google Classroom platform and personally contacting lecturers via WhatsApp messenger (WA) [31].

3) Action Cycle III

As with the implementation of the first cycle and the second cycle, in the third cycle, learning was also carried out twice. In this cycle, preparation for the implementation of learning is carried out based on the results of the second cycle reflection. First, identify weaknesses in the implementation of the second cycle of learning, then make a perfect plan for the third cycle. Second, create more innovative online learning scenarios so that student learning motivation can increase. Third, prepare more innovative learning resources in the form of uploading video tutorials via Youtube, both made personally and using videos uploaded by other people [14].

The next step is action, this step utilizes Youtube as an innovative step in learning, where the material presented is presented in the form of a video tutorial. In contrast, the material taught is the pump performance characteristic curve. The videos are provided to students via the Google Classroom platform. When compared with the first and second cycles, the implementation of the action in the third cycle received more student responses [32]. This is also shown based on the learning outcomes of the thirteenth cycle students, where 83% or 15 of the 18 students are in a complete category. Based on these results, it can be stated that there is a significant increase in student learning outcomes in the third cycle. Besides, in this cycle classical completeness has also been fulfilled so that the research can be declared stopping [33].

After that, proceed to the reflection step. As with the first and second cycles, reflection steps in the third cycle are also carried out to analyze and examine the problems that exist during the learning process. From the results of the study, it was found that: (1) most of the students were getting used to using the Google Classroom LMS as a learning medium; (2) most students have been able to follow the online learning path well; (3) students actively carry out discussions when experiencing difficulties in understanding learning material [34]; (4) learning must be designed attractively and innovatively, it aims to prevent students from experiencing boredom during the online learning process [35]; and (5) lecturers are actively obliged to check students' understanding of the material presented, this aims to minimize students who do not understand the material but are embarrassed to ask questions and discuss [28].

Besides, when viewed from the average student learning outcomes at the end of each cycle it is known that the improvement occurs consistently. In the first cycle the average student learning outcomes were 72.39. Then in the second cycle increased by 1.89 or getting an average learning outcome of 74.28. Meanwhile, in the cycle when it increased by 4.17 or getting an average learning outcome of 78.44. These results are then declared to have met the indicators of learning success where 83% or 15 students have entered the complete category. The increase in learning outcomes in each cycle can be seen in the Figure below.

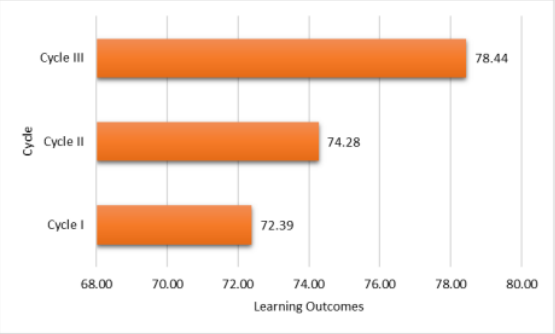

Fig. 3. Improved average student learning outcomes

Based on the results of research and discussion, it can be stated that the implementation of online learning that is effective, efficient, and innovative can improve student learning outcomes in the pump and compressor course S1 Mechanical Engineering Education 2018 Unesa Study Program. These results were proven empirically with the support of research data, which showed an increase in student learning outcomes after online learning was implemented during the Covid-19 pandemic.

IV. CONCLUSIONS

This study found that the implementation of effective, efficient, and innovative online learning can improve student learning outcomes during the Covid-19 pandemic. Based on the data on learning outcomes in the first cycle, it is known that only 44% or 8 of the 18 students achieved the complete criteria. These results then increased in the second cycle, where there were 61% or as many as 11 students who met the criteria. Meanwhile, in the third cycle student learning outcomes increased again, where 83% or 15 students out of 18 students reached the complete criteria.

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