Implementation of Google Classroom-Based Learning Management System on the Subject Digital Signal Processing and Propagation Antennas as One of the Effective Learning Media in the Middle of Pandemic COVD-19

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ABSTRACT

Effective learning is quality learning in relation to the effectiveness of the learning process interaction itself to achieve the expected goals. This study aims to determine the effectiveness of lectures in the middle of the Covid 19 pandemic, where learning by face-to-face method is vulnerable to the spread of the virus. So that the Google Classroom-based Learning Management System in the learning process was chosen as an alternative solution to the problem. This research takes a case study on the learning mechanism of Digital Signal Processing Courses (PSD) and Popagation Antennas by involving students within one semester. The results showed that the application of the Google Classroom-based Learning Management System was proven to get a positive response and was quite effectively used as a learning method in the midst of the Covid 19 pandemi.

Keywords: LMS, Google Classroom, Learning Media

1. INTRODUCTION

Education is a fundamental factor that determines the level of progress of a country. Quality education is needed to produce quality and competitive human resources for the betterment of the nation. Of the 10 ASEAN member countries, Indonesia ranks 6 (six) in terms of quality of education. Indonesia is still inferior to nearby countries, such as Singapore, Brunei Darussalam, Malaysia, Thailand and the Philippines. Based on 2018 Human Development Index (HDI) data, Indonesia ranks 111 out of 189 countries in the world with a score of 0.707, in other words the quality of education in Indonesia is included in the Medium Human Development category [7]. Human Development Index (HDI) is a reflection of the position of a country with other countries in the level of community welfare, namely human development including education. The current condition of education is a challenge for the Indonesian government to constantly strive to improve the quality of education in Indonesia.

Creating an effective learning system is a must in efforts to improve the quality of education. Effective learning itself cannot be separated from quality learning because the quality of learning outcomes depends on the effectiveness of learning that occurs or is embedded in the learning process itself [4]. Revealed the results of their studies in several studies revealed that seven learning indicators were said to be effective, namely: (1) good material organization, (2) effective communication, (3) mastery and enthusiasm for subject matter, (4) positive attitude towards students, (5) giving fair values, (6) flexibility in the learning approach, and (7) good student learning outcomes. Effective learning cannot be separated from quality learning because the quality of learning outcomes depends on the effectiveness of learning that occurs or is embedded in the learning process itself [2]. [5] revealed the results of their studies in several studies revealed that seven learning indicators were said to be effective, namely: (1) good material organization, (2) effective communication, (3) mastery and enthusiasm for subject matter, (4) positive attitude towards students, (5) giving

fair values, (6) flexibility in the learning approach, and (7) good student learning outcomes.

The Covid 19 pandemic that is currently happening is a plague that has had a significant impact on various aspects of life ranging from economic, social, and cultural in the world. One of the impacts of the Covid 19 pandemic for Indonesiain the field of education is the transition from conventional learning systems (face to face) to online learning systems, as a result of the implementation of social distancing. The challenge of this learning method transition is the extent to which the readiness of both educators and students in adjusting from the old learning patterns to the new patterns. On the other hand, the readiness of supporting facilities and infrastructure is also an important thing to consider starting from the availability and effectiveness of tools, network access, to budget readiness. However all these challenges must be anticipated for the sake of the continuation of effective teaching and learning processes in the midst of this pandemic.

Amid the implementation of social distancing policies, e-learning based learning methods are an effective choice to use. This learning method is considered capable of facilitating broader, varied and interesting learning because learning can take place anywhere and anytime without being limited in distance, space and time. Learning Management System or abbreviated LMS according to [1]. is a software (software) for administration, documentation, reporting an activity, teaching and learning activities and activities online, elearning and training materials, all of which are done with on line. An LMS must be able to do the following: 1) use self-service and self guided services; 2) collect and deliver learning content quickly; 3) personalize content and allow knowledge reuse. LMS is a system that can be used in education through software to distribute online programs via the internet. With self service and self guided, students can register and learn independently, with LMS lecturers can manage teaching activities starting from providing material, assignments, questionnaires and assessments.

Currently there are several LMS-based applications available that are quite helpful in home learning systems such as Moodle, ATutor, Chamilo, Google classroom and so on. As part of the LMS, google classroom has several advantages, including efficiency, saving time, access to other Google services, organized, safe, and simple interface. As an LMS, google classroom also has a drawback, namely users must have a google account to use it, so student must have google account to can join in class. In this study, the authors chose the Google Clasroom application as an e-learning media to test the effectiveness of the lecture learning system during the Covid pandemic 19. The reason the author chose the Google classroom platform as a learning medium is that it can be used on smart phones and PCs for free, besides the existence of a tutorial that provide convenience in the use of applications for ordinary people even that can be learned at [8]. This application can be opened via the site https://classroom.google.com

Google Classroom is one of the e-Learning media that makes it easy for lecturers and students to carry out the teaching-learning process [3]. The features presented in this platform include Google Meet which facilitates lecturers and students in conducting conferences directly via shared links. This Google Meet capacity can accommodate up to 250 participants for free [9]. Another feature is the Google Form which helps lecturers in organizing assignments and delivering teaching material. Through Google Classroom, lecturers can divide classes to be taught so that it is more effective in time, another advantage is the security aspect because the platform does not contain advertising and is affordable for students.

2. METHODOLOGY

2.1. Data

The object of this study were students of the Department of Electrical Telecommunications and Multimedia Engineering, Surabaya State University (UNESA) who took PSD (Digital Signal Processing) and Propagation Antenna courses, with a total of 80 students. The research data is in the form of final grades (NA) of students in the two courses which are the result of the formulation of several value components, namely grades, midterm (UTS), and final semester (UAS) formulated into a single unit that is final grade (final grade) NA).

Table 1. Conversion of Evaluation Result Values

Value of Numbers	Category	Information
≥85 - 100	A	Very good
≥80 - <85	A-	Very good
≥75 - <80	B+	Good
≥70 - <75	B	Good
≥66 - <70	B-	Good
≥60 - <65	C+	Enough
≥55 - <60	C	Enough
≥50 - <55	C-	Enough
46-50	D	Lest
0-45	E	Very low

The Final Value is then converted into a standard value at Surabaya State University as Table 1. This research data was obtained through observations during the online teaching and learning process that took place within one semester (January to June June 2020) by utilizing the Google Classroom application.

2.2. Method

The analytical method used in this research is quantitative analysis in the form of descriptive statistics on the value of 2 (two) courses, namely PSD (Digital Signal Processing) and Propagation Antennas. Descriptive analysis method is used to determine the extent of the implementation of Google Classroom-based Learning Management System in PSD (Digital Signal Processing) and Propagation Antennas as One of the Effective Learning Media in the Middle of Covid Pandemic 19. In addition, the author also feeds learning through random distribution of questionnaires to students as many as 30 respondents at the end of the lecture period. This questionnaire consists of 4 (four) question points to find out the extent to which the effectiveness of using Google Classroom, namely: 1) Is google classroom easy to operate; 2) Does the feature provided by google classroom support learning; 3) Does the delivery of material through google classroom help improve skills; 4) Is learning through google classroom effective enough to be implemented during a pandemic. To know for sure the tendency of respondents' answers, then in this case 4 (four) Likert scales are used, namely: Strongly Agree (Sangat Setuju / ST), Agree (Setuju / S), Disagree (Kurang Setuju / KS), and Disagree (Tidak setuju / TS).

3. RESULTS AND DISCUSSION

The initial conditions of the learning process in the period before the pandemic were carried out conventionally in class. Through conventional learning, lecturers can easily see and assess directly the teaching and learning process starting from the activeness during lectures, doing assignments directly and the course of the discussion process to solve an existing problem. However, the drawback of this method is the difficulty in maintaining student interest in what is learned, because conventional methods tend to be boring so as to make absorption less optimal because learning is carried out under conditions that tend to be formal and emphasize mastery of concepts and not competence. The concept of e-learning based learning using Google Classroom requires students to be able to learn more independently. Learning atmosphere that tends to be flexible without limitation of distance, space and time is enough to increase the attractiveness and activeness in learning. With the google form in lectures, antenna propagation material and PSD can be distributed quickly. Through the google form, teachers can also share assignments, determine when assignments should be collected, and at the same time be able to find out the original reports, so they can find out the similarities of answers to students during exams. Through the question application, lecturers and students can interact freely.

Besides having several advantages, google classroom also has weaknesses. Google Classroom is limited only to users who have a google account. To overcome this, it is necessary to make a policy that requires students to have a Google account.

Descriptive statistics of learning evaluation results based on observations of 80 students in one semester within the PSD (Digital Signal Processing) and Propagation Antenna are shown as Table 2.

Table 2. Descriptive Statistics of Final Value

Mean	78,18
Median	79,1
Mode	83,4
Standard Deviation	4,99
Kurtosis	15,69
Skewness	-3,34
Range	32,9
Minimum	50,5
Maximum	83,4
Count	80

Evaluation of learning that is manifested in the final grade shows that the average value (mean) of the two subjects falls into the B + (Good) category of 78.18. With the most values appearing (mode) which is 83.4. The highest and lowest scores for these two courses are 83.4 and 50.5, giving a range of 32.9. The distribution of data to the average shown through the standard deviation value is 4.99, this means that the distribution of final value data tends to be very close to the average value. Positive kurtosis shows data that tend to be homogeneous.

The average final grade in the Good (B +) category is a form of learning evaluation which gives meaning that online learning using Google Classroom is considered effective enough to be applied in the current Covid 19 pandemic. Students have optimally used the Google Classroom application in the learning process, ranging from punctuality in attending teaching material conferences, student motivation in learning through given material, and timeliness in uploading the results of assignments and taking tests given. The distance learning system, supported by the right application, gives more space for students to study and is more independent and actively increases their abilities without fixing on formal concepts as provided through face-to-face learning.

Effectiveness in the learning process is also supported by the results of the feed back questionnaire that was randomly distributed to 30 students. From the results of the questionnaire obtained 93% of students agreed that the Google Classroom application is easy to operate even for users who are still beginners (Figure 1); 83% of students agree that the features provided by

Google Classroom currently support learning ranging from meeting facilities to data management in accommodating teaching materials and assignments during the learning process (Figure 2); 100% of students agreed that the delivery of material through Google Classroom was felt to have helped improve abilities because in this case students were given space to more freely and independently explore abilities (Figure 3); and 100% of students agree that learning through Google Classroom is considered quite effective in the current Covid 19 pandemic which requires physical distancing in all activities. Learning is considered effective because it is flexible done anywhere and anytime (Figure 4).
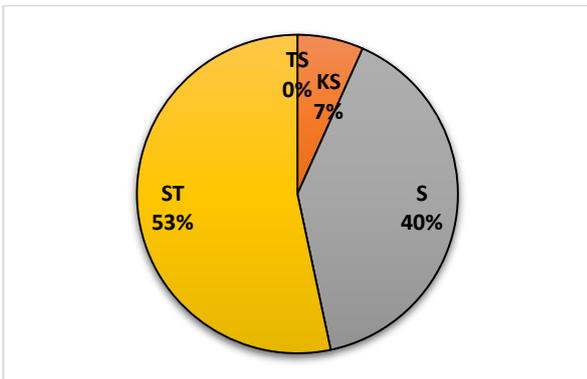

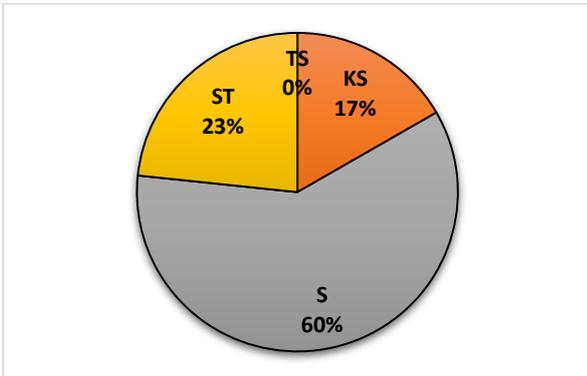**Figure 1.** Google Classroom application is easy to operate

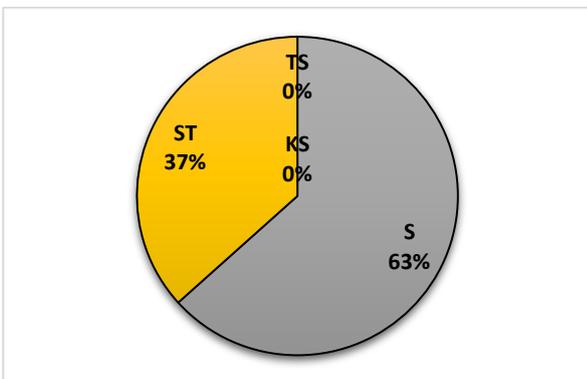**Figure 2**. The features provided by Google Classroom currently support learning

Figure 3. Delivery of material through Google Classroom was felt to have helped improve abilities
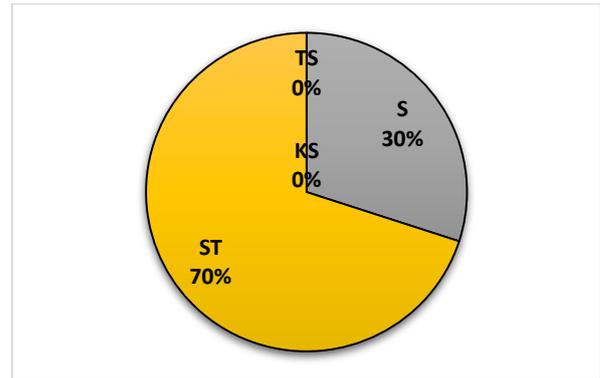

Figure 4. Learning through Google Classroom is considered quite effective in the current Covid 19 pandemic

4. CONCLUSION

The use of electronic media as a tool in learning activities is known as e-learning to be the right choice to be applied to the Covid 19 pandemic situation as it is now that the conditions for physical distancing in all activities that involve many people. Google Classroom as one of the LMS-based applications in addition to providing ease of access and operation also provides a variety of features ranging from remote conferences to the management of assignments and teaching materials to make it easy for educators and students in carrying out the process of distance learning.

The use of Google Classroom in the learning process of PSD (Digital Signal Processing) and Propagation Antennas is considered effective during the current pandemic. This effectiveness is shown through the evaluation results of learning Final Score which is on average included in the B + (Good) category. Effectiveness is also supported by positive responses from students through the learning feed back questionnaire given at the end of the lecture period. Google Classroom has been optimally used by students as a learning media. Students are given the freedom to learn without limitation of distance, space and time. Students are also motivated to learn and explore their abilities actively and independently through the teaching material provided in google form, which is seen through the timeliness in delivering assignments and working on tests or examinations.

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