

Need Analysis of Mathematics E-module for Student and Teachers During Covid-19 Pandemic

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ABSTRACT

E-module is a form of presenting the module in digital or electronic format. E-modules are systematically designed with an electronic format to achieve the learning objectives. Thus, to produce an effective e-module, it is necessary to conduct preliminary research on the needs of teachers and students. Based on previous research conducted in the form of observations and interviews, it's known that teachers and students need teaching materials in the form of e-modules to complete the online learning process from home due to the covid-19 pandemic. This study uses pre-experimental research, that systematic learning to test the hypothesis of a causal relationship. The type of research used in this research is qualitative research. Data collection techniques at this stage are non-participatory observation and in-depth interviews with semi-structured methods with teachers and students, which are early research and development techniques. Students follow online learning from home due to the impact of the Covid-19 pandemic. The developed e-module must-have criteria such as using language that is easy to understand, systematic, can be used independently, interactively, and equipped with learning activities and assessment instruments following the competencies to be achieved.

Keywords: *E-module, Learning materials, Learning from home.*

1. INTRODUCTION

Advances in information and communication technology have made teachers no longer have to act as teachers and sources of knowledge information alone, become managers and developers of learning programs that can help students achieve the required competencies. Especially in the current conditions, the COVID-19 pandemic has resulted in teaching and learning activities are usually carried out directly to be stopped and replaced by learning from home (LFH) [1]. Teachers and students must face the need to adapt to LFH. Teachers are required to adjust various aspects, such as a way to interact with students, types of learning media, the kinds of assignments distributed, and the teaching material provided [2].

Based on the results of observations and interviews with mathematics teachers and students in Surakarta, it revealed that online learning activities through the

WhatsApp and Google Classroom applications were held once a week with a duration of one and a half hours. The learning process begins with the teacher sharing several learning videos taken via YouTube and then asking students to study the material and summarize the material from the video. At the next meeting, the teacher will provide feedback to students and provide practice questions to students. For teaching materials, teachers use student worksheets from one of the publishers determined by the school.

For teaching materials used by teachers, these teaching materials have not reached competence because of learning online. Students have not been able to be independent in learning because students have not met the expected conditions due to a lack of direct supervision.

Teaching materials in an electronic form are using as learning resources and media in LFH during the

online learning Covid-19 pandemic. Electronic teaching materials are a set of materials that coherently and systematically and display the needs of the competencies to be mastered by students in the learning process mixed in interactive multimedia [3]. An electronic module (e-module) is one of the electronic teaching materials. E-module is an electronic module that can use using a computer, laptop, or smartphone. The advantage of E-modules from printed teaching materials is that they are more interactive with additional video, audio, animation, or other interactive features [4]. Using electronic modules allows students to learn with or without a facilitator. One of the criteria for e-modules is learning independence which makes teaching materials available to train students to learn independently.

There are several studies on e-modules. As researched by Nisa [5] the application of e-modules in mathematics subjects resulted from the effectiveness in the moderate category. Research by Wijaya and Vidianti [6] show that the use of e-modules effectively improving learning outcomes. Then, research by Roza Linda [7] e-module can increase students' independence and learning outcomes.

However, researchers have not found research that discusses the student and teacher analysis of needs for electronic modules in learning from home during the Covid-19 pandemic. Therefore, this research focused on finding solutions from the results that have been carried out in researching and producing an e-module product as teaching material.

2. METHODOLOGY

This research uses pre-experimental research, a systematic study to test the hypothesis of a causal relationship [8]. The type of research used in this research is qualitative research. The purpose of qualitative research is to get a depth description and interpretation of an object researched. [9]. Data collection techniques here are observation and interviews with teachers and students the techniques of research and development. The observation technique had used for finding out the description of everything related to the object of study, namely students, and interview techniques are used for teachers and students to find out the problems that occur in learning activities. From the implementation of these two techniques, it is hoped that accurate research data can be applied so that the selection for the right solution to be implemented is as expected.

This research was done at SMA Negeri 6 Surakarta, located on Mr. Sartono street 30 Surakarta, Central

Java. This research had started from November 11 to 13, 2020, where the authors had the opportunity to make observations and interviews with grade 10 mathematics teachers. Observation aims are to find out how the mathematics learning process had been carried out while learning from home, the availability of internet access in the school environment, the teacher's ability to use the internet or e-learning, and the obstacles faced by teachers during the learning process.

Observations used in this study were non-participatory observations, which is an observation that in its implementation does not involve the researcher as a participant or group study [10]. Observations are carried by observing directly at SMA Negeri 6 Surakarta. Researchers are examining the mechanisms, procedures, and obstacles faced by teachers during learning from home. After observation, the researchers then conducted interviews with mathematics teachers at SMA Negeri 6 Surakarta.

The interview technique used is in-depth interviews with the semi-structured method. A semi-structured interview is an interview process that uses interview guides derived from topic development then the researcher can develop research questions according to the desired information needs. [11]

The interview process begins with agreeing in advance with research informants regarding the time able to conduct interviews. Interviews were conducted by conveying some of the questions contained in the interview guide. Interviews with mathematics teachers and students aimed to find out responses to the policy of learning from home, learning mathematics using e-learning, obstacles to learning, and solutions to obstacles.

3. RESULT AND DISCUSSION

3.1. Teaching and Learning Activities from Home during the Covid-19 Pandemic

The teaching and learning process has carried out once a week using the WhatsApp group application and google classroom within 90 minutes during learning from home. The providing material process had delivered through google classroom. The teacher explains competencies that must achieve, then providing several learning videos from YouTube for students to watch and summarize the material

equipped with sample questions according to the learning material at that time.

The next activity that students do is watch the learning video and make a summary within one week. In the following week, the teacher allows students to ask questions related to the material previously presented. After the question-and-answer process, the teacher provides several practice questions that students must do as a formative assessment.

Each subject learning from home had scheduled for one lesson per week with an allocation of 90 minutes. Although the learning allocation had reduced, there had no reduction in base competencies. Based on interviews with teachers, the result shows that teachers must think of ways so that the material provided can right convey to students. It is also necessary to think about how students can learn independently at home when learning from home.

The teaching materials used during learning from home are the same as those used during face-to-face learning, are books published by the Ministry of Education and Culture, as one of the LKS printed by the publisher Intan Pariwara. The school does not provide exclusive teaching materials for students to study online. Based on the interview results, the teacher said that teaching materials needed to help students learn independently and assist students in doing assignments when learning from home. Teaching and learning activities that utilize e-modules are expecting to facilitate students learning from home.

Teachers ask parents to pay more attention to students because teachers cannot directly supervise student learning activities during learning from home. The negative students' attitude during learning from home seems lacking, indicated by some students being late, late in collecting assignments, some even not collecting them, and student participation in asking questions was also lacking. The absence of direct supervision by the teacher causes the responsibility of students to reduce. Conditions like this require teaching materials that can generate student interest in learning independently. The teaching materials should use communicative language so that they can be easily understood by students and as if they were studying accompanied by the teacher.

Based on the results of interviews with students, during the learning process from home, they learn by reading the material provided by the teacher. Because they find it difficult to focus, they have difficulty understanding the material given. According to them, the teaching materials needed when learning from

home are easy to understand and include learning videos. Another obstacle they experience is the unstable signal and requires a lot of internet quota. Based on this, learning using e-modules is suitable for students because, in addition to loading material, learning videos can also add that it seems as if the teacher is explaining to students. In addition, the use of e-modules is flexible can be used offline so that it does not require a network and internet quota.

The assessment carried out by the teacher includes the field of knowledge and skills. The knowledge assessment is based on the results of the tasks carried out by students and the skill assessment is based on the creativity of students in making summaries, as well as the activeness of students in responding to any information provided by the teacher.

3.2. Problems Faced by Teachers and Students During Learning from Home

During the implementation of learning from home, many obstacles had faced by teachers and students. The learning mentoring process is not as effective as face-to-face learning. Online learning requires students to learn independently [12]. Based on the results of interviews that have been done, it shows several problems faced by teachers and students while carrying out learning from home. The following explanation is these problems or obstacles summary felt by teachers and students during learning from home.

Teaching and learning activities are done through the WhatsApp application, Google Classroom, YouTube, and Google Form while learning from home. Teachers admitted that they were not ready to teach with online learning, some teachers only give assignments and ask students to study their student worksheets so that learning materials are achieved. Students find it difficult and bored to understand the material only by seeing explanations from Google Classroom, WhatsApp, and YouTube. Teachers do not have teaching materials that can facilitate students to learn independently during learning from home. In the learning process, the teacher uses student worksheets from one of the publishers determined by the school. Students use books published by the ministry of education and culture and student worksheets printed by Intan Pariwara publishers. The material owned by students is inadequate for independent study, so students need other teaching materials in learning from home to achieve the desired competencies. Many students are not active, and most students do not submit assignments given by the teacher during learning from home. Students cannot understand the

material well so that the teacher's assignments cannot perform optimally and the collection becomes delayed.

3.3. Need Analysis of Module Electronic for Teacher and Students

The presence of learning from home requires teachers and students not to do face-to-face teaching-learning activities ask students to study independently. Students have to understand the subject matter even though it is not taught directly by the teacher. Learning from home or online is often associated with self-study terms [13], so students' responsibility and independence are required.

The module is one of the teaching materials designed to be studied independently by the learning participants. The module is completely packaged and systematically in which it contains a set of learning materials planned and designed to help students master the learning objectives [14]. The module arranges by containing learning objectives, materials, and learning evaluations that are instructional to allow readers to carry out learning activities without the direct presence of the teacher so that the use of the module can help students learn from home.

One form of module presentation is a digital or electronic format or better known as e-module. E-modules are systematically designed with an electronic format to achieve some learning objectives. E-modules can be studied by readers using a computer or smartphone. The advantages of e-modules from printed materials are that they are more interactive with the addition of video, audio, animation, or other features and equipped with tests [15]. E-module can control the content students learn. It's designed by the teacher to adjust to the competencies to be achieved [16]. Recommended applications to create e-modules include Exelearning, Kvisoft Flipbook Marker, 3D Page Flip Professional, and Flip PDF Professional [17]. E-modules allow learning occurs not only in the classroom but also outside the classroom. From here, the E-module supports online learning from home.

E-modules have arranged in advance are validated by experts or experts consisting of media experts, material experts, and linguists before being tested on students. The e-module validation aims to test the suitability of the module with the basic competencies to be achieved and the readability of the e-module, in terms of the extent to which the resulting e-module can be understood by its users. After the validation and revision process is complete, the e-module is ready to be used.

By using e-modules as teaching materials in learning activities, hopes it can facilitate the process of teacher-student interaction, to help students learn independently optimally and overcome problems faced by teachers and students during online learning from home at SMA Negeri 6 Surakarta in particular. Based on the above explanation, here are some advantages of using teaching materials in the form of e-modules. During online learning from home for teachers, (1) there is an active interaction that is easier to achieve by teacher-students, (2) the teaching materials provided can access repeatedly. For students, (1) it is more flexible regarding time and location, (2) can be learned at their own pace and will, (3) easier to understand and interact with additional video, audio, animation, or other interactive features. , (4) facilitating face-to-face discussion opportunities through the zoom platform or google meetings.

4. CONCLUSION

Based on the results and discussion, it can conclude that the use of teaching materials in the form of electronic modules can overcome the problems faced by teachers and students during online learning from home due to the impact of the COVID-19 pandemic. It is in line with the research result conducted by Anisa [18] that e-modules use as teaching materials can improve mathematics learning outcomes when learning from home. In addition, the research results of Nursita [19] show that the use of e-modules when learning from home can increase students' positive attitudes towards learning mathematics. Therefore, it is necessary to develop electronic modules arranged based on the competencies to achieve and student conditions, systematically, equipped with learning activities in the form of learning activities and additional features in the form of video, audio, animation, or other interactive features.

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