

# The Development of Edmodo E-Module Assisted Statistics Teaching Materials for Public Senior High School Number One

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## ABSTRACT

The objective of this research is to create an e-Module prototype of statistical material with the assistance of Edmodo e-learning which is tested for its validity, practicality, and potential effects. The contribution is expected to provide benefits: for teaching teachers of statistics subjects, as an alternative learning medium in the learning process that clarifies and makes it easier to present statistical material, and trains teachers and students to be creative in using IT. Benefit for students is to achieve optimal results in learning statistical material, can learn independently in a fun way, and increase student activity in learning. Research also gives a contribution to the development of science and technology can overcome the limitations of time and space in learning. Designed for one semester to produce e-Modules of statistical material, learning implementation plans, student worksheets, and test instruments. Research was tested limited to students of class VIII at Senior High School Number 1 in SP Padang. This research which consists of two stages, namely the preliminary study (the preparation stage, the e-Module prototype development stage) and the formative study stage (the evaluation and revision stages). Data collection techniques used in the form of questionnaires and tests, and was analyzed descriptively.

**Keywords:** Teaching materials, E-module, Edmodo, Senior high school.

## 1. INTRODUCTION

The students were given a sufficient understanding of statistics learning as the statistics are a core course at X to XII in senior high school, especially for the science majors. The research statistics provide good provisions for students to be able to think and do activities carefully, precisely, correctly, using general and clear systematics. The presentation of the research is not subjective, emotional, express conjecture, prejudice and is without facts.

According to Satori and Komariah [5] the research conducted with the scientific method is based on rational, empirical, and systematic scientific characteristics. The research that requires a hypothesis on the problems raised by students is expected to be tested to obtain answers, whether the hypothesis is based on theoretical studies is true or false. Hypothesis testing can be completed if there is sample data which is a representation of the population data. The data obtained from respondents is closely related to sampling techniques. In order to understand this material deeply, the statistics are required.

Winarno Surakhmad [9] states that statistical knowledge cannot be ruled out for a particular discussion for research investigation. Therefore, to support the students' understanding of statistics, they are also required to study the fundamental of statistics courses from junior high school to the first year of senior high school level. Statistics have a role as a tool for analysis and interpretation of quantitative scientific data as the conclusion is drawn from the data. According to Tiro [8] statistics is a scientific way to collect, organize, present and analyze data, and draw valid conclusions to make proper decisions based on its analysis. Thus, it can be said that statistics are used as a means of developing a way of thinking logically. Sigit Nugroho [6] states that the statistics are concerned with the scientific method to collect, organize, summarize, present, analyze data including drawing valid conclusions, and making reasoned decisions based on certain analyzes.

Panen [3] explains that in meaningful teaching theory suggests that the meaning of presentation and the importance of regulating learning progress and advance organizer where

teaching materials must be designed properly to be attractive to students. To overcome this problem, the researcher wants to provide alternative solutions to problems, namely by developing independent learning resources in the form of modules that will direct students not to experience difficulties in learning statistics, as well as making learning that is liked by them so that they are more creative and take advantage of the internet/wifi on campus for the process learning. The learning module is one of the independent learning resources for students which is used to facilitate the distribution of learning messages to be conveyed to students and to enable students to study independently. According to Purwanto, et al [4], the purpose of compiling the module is to support to master the competencies taught in learning activities using an electronic module (e-Module).

The researchers want to develop e-modules due to the student's capability to operate electronic devices that can read electronic modules (e-modules) such laptops and smartphones that enable students to study anywhere. With the existence of teaching materials in the form of e-Modules that are integrated directly with the student learning needs, specifically derivative materials that will directly train the teaching and learning system. There are some studies on eModule development by Nurmawati et al [2] that e-module media using the Guided Note Taking model in Mathematics II course is valid and can be used in the learning process. Their research result shows that learning using e-module media using the Guided Note Taking model is better than conventional learning.

The research question for this study is "How is the development of Edmodo e-module statistics teaching materials that have been tested for validity and practicality for 4th-semester students?"

## **2. LITERATURE REVIEW**

### **2.1 The development of Teaching Materials**

The development of teaching materials derived from two words "development" and "teaching materials". According to Sugiono [7] the term development refers to an activity to produce a new tool or method, during which the assessment and improvement of the tool or method are continuously carried out during the activity.

Based on the scope of the teaching material content above, the teaching materials developed are structured and systematic, so that the content of the teaching materials can direct the development of valid, practical teaching materials and have potential effects on students.

### **2.2 E-Modul**

According to Azis and Jayanti [1] that e-module is a learning tool that consists of material, methods, limitations and the ways of evaluating which are designed systematically and attractively to achieve the expected competencies in accordance with the level of complexity electronically that is a part of e-learning. The objectives of e-module development according to the UT e-Library are:

1. Clarify and facilitate the message presentation to minimize the verbal learning.
2. Overcoming the limitations of time, space and sensory power both students and teachers or instructors.
3. Can be used appropriately and varies, such as to increase the motivation and passion for student learning, to developep the student's ability to interact directly with the environment and other learning resources, to develop the independent learning according to their abilities and interests, and to develop the measurement or evaluation of their own learning outcomes.

## **3. METHOD**

### **3.1 Research Desain**

Referring to the research objectives that have been stated in the introductory section, the research type is development research or Development Research [1]. The e-module development is carried out in two stages, namely the preliminary study stage consists of the preparation and model development stage and the formative study stage consists of the evaluation and revision stages.

## **4. RESULT AND DISCUSSION**

### **4.1 Result**

This research is a development research or Development Research. The e-module development is carried out in two phases. The first phase is the preliminary study stage consists of the preparation and model development phase and the second phase is the formative study stage consists of the evaluation and revision

stages. The following are the development steps through stages:

4.1.1. Priliminary

Preparation; This stage includes a curriculum analysis of statistical material following Indonesian National Qualifications Framework (K13) and Class 12 semester 1 statistics course, Senior High School Number One in SP. Padang Students and contact with lecturers at Senior High School Number One in SP. Padang Students as well as other preparations such as scheduling and collaborative procedures with lecturers used in the research. Those procedures are based on the schedule of both researchers who are lecturers and the statistics course lecturers to facilitate the implementation of this design.

Material design (prototyping); This stage includes designing the e-module of the statistical material that is assisted by Edmodo and the semester learning plan tools. In this phase, the researcher designed the edmodo e-module tool for research statistics teaching materials, including designing the edmodo e-module in the form of teaching materials, RPP and the student activity student. The process of designing Edmodo e-modules as an assessment instrument was carried out by prototyping that has three characteristics include content, construct, and language. Those characteristics are the focus of the assessment of each prototyping.

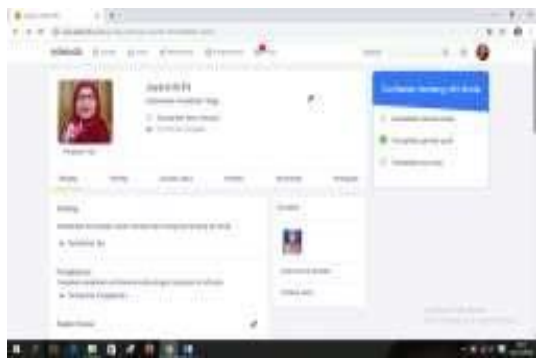


Figure 1. The home page of emodul Edmodo for Jayanti

4.1.2. Formative Study

This evaluation is using formative that includes these three evaluations below.

- (1) Self Evaluation. In this stage, a self-assessment is carried out on the e-module prototype of statistical material assisted by Edmodo.
- (2) Expert Reviews. In this stage, the e-modile is tested by material, statistical, and IT

experts. Meanwhile, the material validation through questionnaires in terms of content, construction and language is in accordance with the principles and characteristics of online learning. It focusses on clarity, image definition and context suitability though the questionnaires. Furthermore, the validation results are revised.

- (3) One to one, small group dan field test.

4.2 Discussion

Module validation is carried out by material experts, module experts, and Mathematics and Information Technology teachers who assess the validity of the first draft module. The validators chosen in this study were: Dwi Joko A as a Mathematics Teacher, Pria Winardi from LP3I Palembang as an Information Technology Lecturer, and Imron as a Science Lecturer. The first draft of the learning module given to the three validators above went through the revision phase to get valid e-module learning. The revisions given by the validator to the first draft of e-learning modules, in general, are as follows.

Based on the table 1, it can be seen that the e-module developed can meet the minimum valid criteria on the aspects of content feasibility, construct feasibility, and language feasibility. So, it can be concluded that the e-module developed has valid criteria with an average of 3.8. Teaching material validation consists of content validation, construct validation, and language validation.

After the revision was completed and the validator confirms the validation of the learning module. The second draft of the learning module was produced which would then be conducted with limited trials.

**Table 1.** Validator's revision of Edmodo e-Module

Research Aspect	Revision
The Content Feasibility	To clarify the parts of the components K13 and adjust to KD and SK on e-modul.
Constructive Feasibility	Create an interactive elearning module that can attract students in the digital and technology era.
Language Feasibility	Put the attention to the writing ways for less students and reader confusion.

#### *4.2.1 The results of the student response questionnaire assessment*

The second draft of the learning emodule is practicality will be assessed through limited trials. The practical assessment of the Edmodo e-module in the developed statistics subject was carried out by 5 students in the class of XII at Public Senior High School Number 1 in SP Padang. The assessment is completed by filling out a student response questionnaire consisting of 16 questions. After those students were allowed to study using the second module of e-module Edmodo learning, at the end of the meeting students were given a response questionnaire to see the student's response to the e-module developed.

Based on the table, it shows that the Edmodo e-module for the courses developed meets the minimum practical criteria in all aspects. So, it can be concluded that the Edmodo e-module for statistical learning developed has practical criteria in its use with an average of 72%. Even so, there are comments and suggestions given by students on the second draft of the Edmodo e-module in statistics lectures that students have used. The following are some of the comments given by students, it can be seen from the use of Edmodo online which is very well used, can be uploaded and opened on smartphones and laptop applications. However, it is constrained by students who have the limitation of accessing smartphones or laptops. After obtaining the second draft, a revision was made of the students' practical results in the small group sample test on the small group. The review was carried out to produce the third prototype or the third draft which would be tested in a larger group of students which consisted of one large class.

#### *4.2.2 Field Test*

After obtaining a valid and practical third prototype or the third draft, a field test was conducted on the research subject of the school.

This stage is carried out to determine the extent to which the level of success and does not affect student learning that has been taking place using the Edmodo e-module in statistics.

The lectures are conducted for more than two months consisting of face-to-face lectures in class and questions that can be opened through an android application in the form of smartphones and computers which makes it easier for students to study anywhere. After learning several times meetings, the students were given a final test on statistical questions to find out the extent to which students' understanding of learning in statistics for which learning is used the Edmodo e-module application. The research results discover that the average test of all students in one statistical question was good enough in their ability to absorb and work on statistical questions.

From these results, it can be categorized as lecture learning assisted by the Edmodo e-module in this statistical subject which has a good potential effect on student learning outcomes.

## **5. CONCLUSION**

The e-module development was conducted in two phases, the first phase is the preliminary study stage consists of the preparation and model development phase and the second phase is the formative study stage that consists of the evaluation and the revision phase. The development phase includes 1) priliminary phases includes preparation and the material design (prototyping) and 2) formative study that is using the formative.

The validity of the developed mathematics learning module can be seen from the results of assessments by material experts, module experts, and mathematics and IT computer lecturers. The practicality of using the edmodo emodule in research statistics is known from the results of filling out student response

questionnaires by students as well as the potential effect on learning outcomes.

- a. Based on the assessment result from the mathematics learning module by material expert, module experts, and mathematics lecturers and IT computer lecturers, it can be concluded that the learning module developed has valid criteria with an average of 3.8.
- b. Based on the assessment result of surveys, it can be concluded that the statistical Edmodo e-module developed has practical criteria with an average of 72%.
- c. Lectures assisted by Edmodo emodule in the statistic course have a good potential effect on the student learning outcomes.

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