

DISSEMINATION PRODUCT OF MOBILE LEARNING WITH ETNOMATHEMATIC MODELS TO LEARNING GEOMETRY

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Abstract-This study aims to determine the feasibility, effectiveness and practicality of mobile learning products in the subject of extended geometry at open University Semarang. This research method uses the Borg and Gall development model with 10 stages in it. Namely (1) Research and Information Collecting, (2) Planning, (3) Develop preliminary form of product, (4) Preliminary field testing, (5) Main product revision, (6) Main field testing, (7) Operational product revision, (8) Operational field testing, (9) Final product revision, (10) Dissemination and implementation. In this follow-up study using steps 7-10 with the result of a mobile learning with ethnomathematic models that has been tested expanded by giving a questionnaire response to students and lecturers, with the results of the average percentage of student responses namely media aspects by 80%, material aspects by 90%, aspects language and appearance by 75% and sample aspects of questions and exercises by 90% means that students generally asses this product to be valid and practical to use in classroom learning, while the results of the average percentage of lecturer responses are media aspects by 90%, material aspects by 100 %, aspects of language and appearance by 100% and sample aspects of questions and exercises by 90% its means that lecturers in general assess this product is very valid and practical used in learning geometry in the class, then the posttest results obtained by the average grade of experimental class is better than class control is $70.25 > 65.34$ and t count $> t$ table is $1,21 < 1,36$ so that this product is effectively used as a media for learning mathematics for the mathematics education program at open University Semarang.

Keywords-Mobile Learning, Ethnomatematics, Geometry

I. INTRODUCTION

The study previous data was obtained that produced mobile learning prototypes in geometry courses that were feasible to use according to expert validation, then from the post test results in a limited test in the Open University mathematics education study program obtained average student scores were 60 meaning mobile learning products at geometry courses have not helped students in mastering the material thoroughly, while based on the student response questionnaire data shows that more than 85% of students are enthusiastic and motivated in using Mobile Learning media in the learning process because mobile learning applications are designed for all types of smartphones and are easy to use.

Development research according to borg & gall covering 10 steps, for steps 1-6 mobile learning products have been produced that are suitable for use in the learning process according to experts and students at the open university, while for steps 7-10 are (7) Design revision (8) Usage testing (9) Product revision, (10) Mass production will be carried out extended trials in the open university mathematics education study program, with the hope that this product can increase student motivation and learning outcomes anytime and anywhere.

A. Special Purpose

This study generally aims to produce products in the form of mobile learning applications in geometry courses that can be used in open universities so that they can produce smart, creative and innovative human resources who are able to use in the global era.

B. Urgency of Research

This research is expected be able to produce theoretically and practically as follows: theoretically it is expected to rich the theory of existing learning models, especially those based on ICT. Practically, the results of this study are expected to provide input for lecturers and students mathematics to be able to package Android based learning media that are more interesting, one of them is by using mobile learning with ethnomatematics models.

II. PRELIMINARIES

A. Mobile Learning Media

Mobile learning is sometimes also called m-learning, learning is done using small devices or portable computing devices. These computing devices may include: smart phones, personal digital assistants (PDAs) and other handheld devices. There are several debates about the entry of tablets and laptops. Mobile Learning is learning that utilizes technology and mobile devices. In this case, the device can be a PDA, cellular telephone, laptop, tablet PC, and so on. With mobile learning, users can access learning content anywhere and anytime, without having to visit a certain place at a certain time. Mobile learning is chosen as one of the learning services because it

also has several advantages compared to other learning which can be used as a mobile media that has a relatively cheaper price compared to the price of a desktop PC and smaller than a desktop PC. With these advantages, mobile learning can be a breakthrough as a learning media.

B. Ethnomatematic Model

Ethnomatematics is a form of mathematics that is influenced or based on culture.[1], holds that today the field of ethnomatematics, namely mathematics that arises and develops in society and in accordance with local culture, is central to the learning process and teaching methods. This opens up the pedagogical potential that takes into account students' knowledge gained from learning outside the classroom. According to [2], ethnomatematics include mathematical ideas, thoughts and practices developed by all cultures. Ethnomatematics can also be considered as a program that aims to learn how students understand, understand, articulate, process, and finally use mathematical ideas, concepts, and practices that can solve problems related to their daily activities. Ethnomatematics uses broad mathematical concepts related to various mathematical activities, including activities of grouping, counting, measuring, designing buildings or tools, playing, determining locations, and etc.

C. Geometry Learning

Geometry is a mathematical part that discusses the shape and size of an object that has a certain order, based on the curriculum of KKNi SN Dikti. students about basic concepts in geometry so that students can solve problems related to concepts that exist in analytic geometry. in addition, this course also aims to provide a strong tool and foundation for students to study further subjects and those who need material in geometry such as calculus II subjects, Multivariable Calculus, and Transformation Geometry.

III. RESEARCH METHODS

This research includes the types of research and development or types of development research. The development carried out was the development of mobile learning with etnomatematic models to learning geometry which will be carried out for 2 years. The procedure for developing learning devices uses a model developed by Borg and Gall which includes 10 stages, namely (1) Research and information collecting, (2) Planning, (3) Developing preliminary form of product, (4) Preliminary field testing, (5) Main product revision, (6) Main field testing, (7) Operational product revision, (8) Operational field testing, (9) Final product revision, (10) Dissemination and implementation

In the second year, stage (7) Operational product revision is carried out in an integrated manner where the activity at this stage is a trial draft 2 to find out whether draft 2 has shown a performance as expected. If there are still weaknesses then the stage is carried out (8) Operational field testing is an improvement in draft 2 to analyze weaknesses based on the results of the expanded trial. The next step is (9) Final product revision that produces a revised draft 2. The results of the

improvement from draft 2 are then called the final draft that is ready to be published. The final stage of this research is (10) Dissemination and implementation. This stage is taken with the aim that the product that has just been developed, namely mobile learning in the geometry course can be used by the wider community. The core activity at this stage is to disseminate products from development at regional and national levels. This publication is carried out through professional meetings and in the form of seminars, scientific international journals.

The research procedure that adopts the 10 stages of development of Borg and Gall can be seen in Figure 1 below.

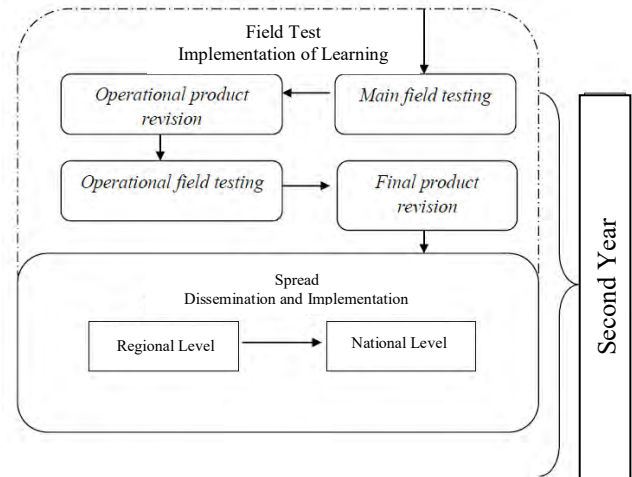


Fig. 1. Research Schemes for the Development of Borg and Gall of the Second Year

A. Research subject

Research subject is class IVA and IVB open University Semarang school year 2018/2019.

B. Data Collection Method

Data collected on the development of mobile learning in the form of quantitative data as the main data and qualitative data in the form of advice and input from respondents as additional data. The data provides an overview of the feasibility of the product being developed

IV. RESULT

The students open university has received a very good response, because in the open university, lecturers and students has been not used mobile learning in classroom. Based on the results of interviews and filling in questionnaires by students the results average percentage of student responses namely media aspects by 80%, material aspects by 90%, aspects language and appearance by 75% and sample aspects of questions and exercises by 90% means that students generally asses this product to be valid and practical to use in classroom learning.

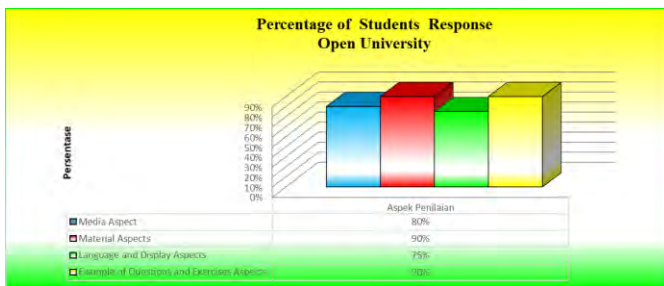


Fig. 2. Students Response Open University

The results of the average percentage of lecturer responses are media aspects by 90%, material aspects by 100 %, aspects of language and appearance by 100% and sample aspects of questions and exercises by 90% its means that lecturers in general assess this product is very valid and practical used in learning geometry in the class.

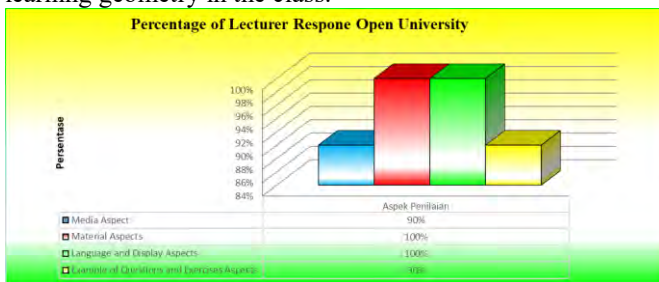


Fig. 3. Lecturer Response Open University

Based on the posttest results obtained by the average grade of experimental class is better than class control is $70.25 > 65.34$ and $t \text{ count} > t \text{ table}$ is $1,21 < 1,36$ so that this product is effectively used as a media for learning mathematics for the mathematics education program at open university semarang.

V. CONCLUSION

Based on the results from second year research, several aspects of lecturer and student responses have been produced holistically. It can be concluded that mobile learning products have been produced that are suitable for use in the learning process mathematic education programs at open universtiy and have received excellent responses from lecturers and students so that mobile learning products are marketed in university.

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