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Implementation of Augmented Reality Book on Geometry Analytical Spaces Course in University

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Abstract: This advanced research aims to determine the feasibility, effectiveness and practicality of augmented reality textbook products in the geometry analytic space course. In the 2nd year, it continued the expanded test of augmented reality textbook products at UIN Walisongo Semarang because teaching materials had been validated by experts and limited testing in UPBJJ UT Semarang's. This research method uses the Borg and Gall development Model with 10 stages that's are research and information collecting, planning, develop preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, dissemination and implementation. In this follow-up study using steps 7-10 with the produced augmented reality textbook product have been tested expanded. The augmented reality textbook products obtained from students and lecturers responses with the average results of the percentage student responses, namely the media aspect by 85%, material aspects by 87%, language and display aspects by 85%, sample problem and training aspects by 90% means that students generally, assess this product as valid and practical to use in classroom learning while the results of the average percentage of lecturer responses are media aspects by 85%, material aspects by 90%, language and display aspects by 85% and the sample aspects of the questions and exercises by 87% are meaning that the lecturer in general considered this product very valid and practical to use in geometry analytic space learning in the class then the post test results obtained the average value of the experimental class better than the control class 80.15>63.25 and t count<t table which is 1.35<1.78, so that, this product is effectively used as a medium for learning mathematics for mathematics education study programs at Walisongo State Islamic University Semarang.

Key words: Development, AR Book, geometry analytic space, mathematics, education, analytic

INTRODUCTION

Based on the results of observations in Semarang city lecturers of the mathematics education study program at Open University Semarang UPBJJ 2015/2016 academic year data obtained that the learning that has been running in the mathematics education study program still encountered several problems, namely: tutors are still dominant in classroom learning, it can be seen from almost 50% of students just sitting still, listening to the material, taking notes then working on the exercises, the learning model has not been used which makes students active. Lack of renewable teaching materials that support the implementation of the learning process, lecturers use teaching materials more than Open University and have not used augmented reality in developing teaching materials, students understanding of existing modules because at Open University module geometry analytical spaces is still unable integrating the appearance of 2 dimensional books into 3 dimensions, so that, for student abstractions it is still weak.

Development research according to Borg and Gall development steps covering 10 steps, steps 1-6 have produced augmented reality textbook products that are suitable for use in the learning process according to teachers and students at open university while for steps 7-10 are (7) design revision (8) usage testing (9) product revision (10) mass production will be carried out an expanded trial di mathematics education program at UIN Walisongo Semarang with hope that product can increase student motivation and students have high enthusiastic towards space analyte geometry subjects.

According to Szalavari and Gervautz (1997) research shows that with augmented reality, student learning independence is better to find a concept or formula for a problem. Reinforced by research Nichols (2009) which explains that with augmented reality, the value of renewal of a media or instructional materials will never die or value noveltynya always berkembang. Kemudian reinforced by Milgram (2006) which shows that augmented reality can combine two

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objects, namely 2 and 3 dimensions, so that, teaching materials or learning media become more interesting.

Based on the description, the problem can be formulated as follows: how to develop instructional materials assisted by augmented reality on the subject of space analytic geometry in an expanded manner? And does learning using teaching materials assisted by augmented reality in terms of student learning outcomes take place effectively?

MATERIALS AND METHODS

This research includes the type of R&D (Research and Development) or the type of development research using a model developed by Borg and Gall. In this study includes stage (7) operational product revision which is carried out in an integrated manner where the activity at this stage is a trial draft 2 involving 9 classes. This trial was conducted to find out whether draft 2 had 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 pursued with aim that the newly developed product can be used by the wider community. The core activity in this stage is to implement of augmented reality textbook products in the geometry analytic space course in university. The research procedure that adopts the 10 stages of development of Borg and Gall can be seen in Fig. 1.

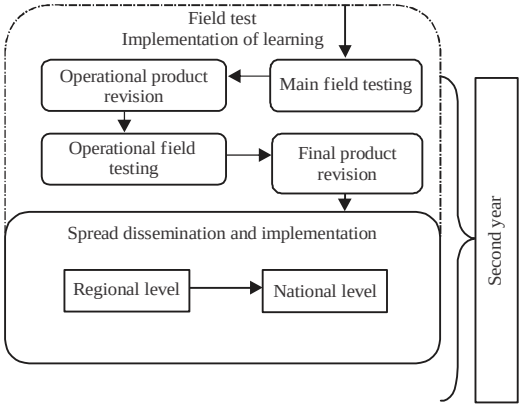

Fig. 1: Research scheme for the development of Borg and Gall

RESULTS AND DISCUSSION

Results of the average results percentage student responses namely the media aspect by 85%, material aspects by 87%, language and display aspects by 85%, sample problem and training aspects by 90% means that students generally, assess this product as valid and practical to use in classroom learning (Fig. 2).

The results of the average percentage of lecturer responses are media aspects by 85%, material aspects by 90%, language and display aspects by 85% and the sample aspects of the questions and exercises by 87% are meaning that the lecturer in general considered this product very valid and practical to use in geometry analytic space learning in the class (Fig. 3).

Based on the post test results obtained the average value of the experimental class better than the control class 80.15>63.25 and t count<t table which is 1.35<1.78, so that, this product is effectively used as a medium for

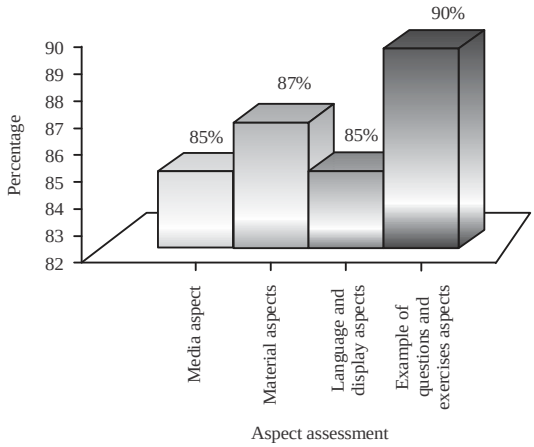

Fig. 2: Percentage of response students UIN Walisongo Semarang

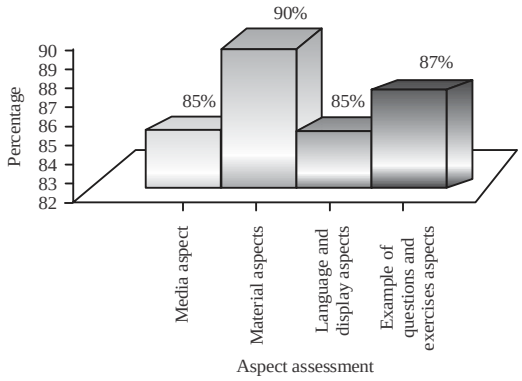

Fig. 3: Percentage of response lecturer UIN Walisongo Semarang

learning mathematics for mathematics education study programs at Walisongo State Islamic University Semarang.

CONCLUSION

Students generally, value this product as valid and practical for use in classroom learning. While lecturer in general considered this product very valid and practical to be used in the study of geometry analytical spaces learning in the classroom. Product augmented reality textbook is effectively as a medium of mathematics learning for mathematics education programs at UIN Walisongo Semarang.

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