Implementation of Mobile Math with Seamless Learning Model on Analytical Geometry Course in University

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Submission date: 16-Feb-2023 11:11AM (UTC+0700)
Submission ID: 2015389550
File name: 3C_4-6.pdf (54.43K)
Word count: 1575
Character count: 8749

Journal of Engineering and Applied Sciences 15 (1): 4-6, 2020
ISSN: 1816-949X

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Abstract: This study aims to determine the feasibility, effectiveness and practicality of MobileMath products the subject of extended space analytic geometry at UIN Walisongo Semarang. This research method uses the Borg and Gall development model with 10 stages in it namely 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 result of a seamless learning based MobileMath product 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 79%, material aspects by 80%, aspects language and appearance 82% and sample aspects of questions and exercises 81% means that students, generally, judge 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 of 100%, material aspects of 100 %, aspects of 65 language and appearance of 97% and sample aspects of questions and exercises of 100% means that lecturers in general assess this product is very valid and practical used in learning geometry analytics in the class then the post test results obtained by the average grade of experimental class is better than class control is 73.33>62.66 and t count>t table is 1.75>1.48, so that, this product is effectively used as a media for learning mathematics for the mathematics education program at UIN Walisongo Semarang.

Key words: MobileMath, seamless learning, geometri analitika, geometry, analytics, judge

INTRODUCTION

In the previous research, data was obtained that produced MobileMath (Mobile learning mathematics) prototypes in analytical geometry courses that were feasible to use according to expert validation then from the post test results in a limited test in the mathematics education program at the Universitas PGRI Semarang, the average student score was obtained. About 65 means that MobileMath (Mobile learning mathematics) products in analytical geometry courses have not helped students master the material thoroughly whereas based on the student response questionnaire data obtained that more than 85% of students are very enthusiastic and motivated in using MobileMath (Mobile learning mathematics) media in the learning process because the MobileMath (Mobile learning mathematics) application is designed for all types of smartphones and is easy to use (Holzinger *et al*., 2011).

In this development research according to Borg and Gall (2001) development steps covering10 steps, steps 1-6 have produced digital math game products that are suitable for use in the learning process according to experts and students at Universitas PGRI Semarang 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 in the mathematics education program of UIN Walisongo Semarang with the hope that MobileMath (Mobile learning mathematics) products can increase motivation and learning outcomes students anytime and anywhere.

In this follow-up study, the same course is still chosen, namely the geometric analytical course this course was chosen because it is very needed by students of mathematics education study programs as supplies for teaching in high school. In this analytical geometry course students are required to master geometric material analytes in depth include logical thinking skills, spatial analysis of all geometry problems. This is consistent with the opinion by Budiarto (2000) that the purpose of analytic geometry learning is to develop the ability to think logically, develop spatial intuition, analyze data, instill knowledge to support other material and can read and interpret mathematical arguments.

This follow-up study is reinforced by Looi *et al*. (2010). Demonstrate that the use of mobile learning with a seamless learning model in lectures at university universities in Singapore is able to increase student motivation and learning outcomes (Garris *et al*. (2002). That children now commonly use mobile media in learning in schools then about the model of seamless learning a comprehensive literature study has been conducted by Wong (2010) who identifies 10 dimensions of seamless learning, namely: includes formal and

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informal learning; personal and social learning; flexible time; flexible location; access to ubiquitous knowledge (learning to integrate context-conscious, learning augmented reality and internet access everywhere) includes the physical and digital world; combined use of several types of learning media devices (such as computers, interactive whiteboards with mobile devices) easy transition in several learning tasks (such as data collection, analysis, presentation and communication). Knowledge synthesis (integrating previous and new knowledge, abstract and concrete knowledge and multi-disciplinary learning); integration of several models of pedagogical learning activities (Kebritchi and Hirumi, 2008). From this explanation it is very suitable if the seamless learning model is used for smartphone assisted learning because it is able to reach for formal and informal learning with more flexible learning in terms of time and location.

Based on the description, the problem can be formulated as follows: Does learning using MobileMath (Mobile learning mathematics) with the seamless learning model take place effectively and practically (Swearingen, 2011)?

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 (Fig. 1). 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 the aim that the newly developed product can be used by the wider community. The core activity in this stage is to implement the MobileMath product with seamless learning model on analytical geometry at UIN Walisongo Semarang. The research procedure that adopts the 10 stages of development of Borg and Gall can be seen in Fig. 1.

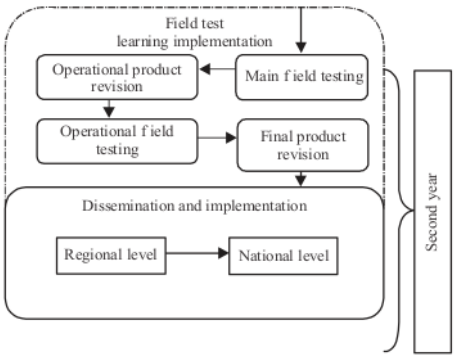

Fig. 1: Research scheme for the development of Borg and Gall

RESULTS AND DISCUSSION

Results of the average percentage of student responses namely media aspects by 79%, material aspects by 80%, aspects language and appearance 82% and sample aspects of questions and exercises 81% means that students generally, judge this product to be valid and practical to use in classroom learning (Fig. 2).

The results of the average percentage of lecturer responses are media aspects of 100%, material aspects of 100 %, aspects of language and appearance of 97% and sample aspects of questions and exercises of 100% means that lecturers in general assess this product is very valid and practical used in learning geometry analytics in the class (Fig. 3).

The post test results obtained by the average grade of experimental class is better than class control is 73.33>62.66 and t count>t table is 1.75>1.48, so that, this

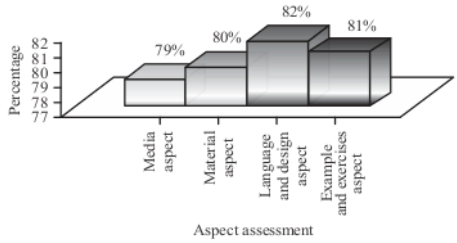

Fig. 2: Percentage of student response from UIN Walisongo Semarang

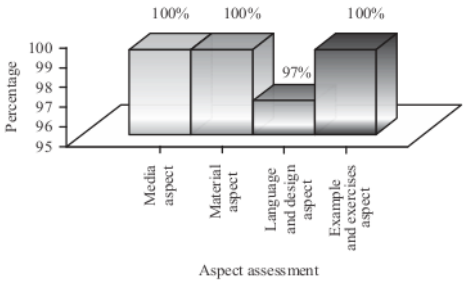

Fig. 3: Percentage of lecturer response in UIN Walisongo Semarang

product is effectively used as a media for learning mathematics for the mathematics education program at UIN Walisongo Semarang.

CONCLUSION

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

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