

DEVELOPMENT OF COMPILATION MATERIALS IN THE FORM OF MATHEMATICS ALGEBRA COURSE MODULES

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ABSTRACT

This paper is the result of research and development applied in 3 stages of research, namely preliminary stage, small group trial, and last field test. The introductory stage includes the analysis of teaching materials through literature studies; designing and developing compilation materials; validating teaching materials by two experts; and the revision of unity. The small group trial includes a limited test of ten students selected randomly as the sample of the product tested and second revision. The method used in the second stage is a single experiment of one shot case study. Field test phase includes the use of product materials conducted on 30 students of subjects matrix algebra course academic year 2016/2017 at Mathematics Education Program of Muhammadiyah University of Sukabumi. This field test uses prototype development. The instruments used in this research are the observation sheet, validation sheet, interview guide, the material performance appraisal sheet, and the description test. The validation result of two experts indicates that the matrix algebra course compilation module is in clear category and the aspect for the validity and validity of the valid category. Semester study plan, interview guide, student activity observation sheet are considered as valid category, the success of student learning activity belongs to successful category, practicability of compilation instructional material when viewed from the aspect of practicality including in the category of practical, effectiveness, interest of students to compilation material, and student results, are better than learning using prior teaching materials compilation. Therefore, the compilation of teaching materials developed meets the criteria of valid, practical, and effective use in learning.

Keywords: teaching materials, compilation module

1 INTRODUCTION

The importance of the role of Mathematics makes this subject always taught in every educational unit and at every grade level with much more portion and lesson time than any other subjects. In line with the curriculum set by NCTM, the Directorate of Learning and Student Affairs (BELMAWA), states that learning outcomes for Mathematics education students is based on the Indonesian National Qualification Framework (KKNI). The learning outcomes that are intended in the NCTM curriculum and BELMAWA are contained in the course analysis, such as the Matrix Algebra course. Matrix Algebra course is a course of science and skills that must be studied with a total of 2 credits by students of Mathematics Education Program. This course is a basic as stock to teach at school, but it is also a prerequisite for Linear Algebra courses and other lecture courses.

Based on the observation made by researchers on the students of Mathematics Education Program of Muhammadiyah University of Sukabumi, especially in Matrix Algebra course lecture, it is found that students have difficulties to understand

the materials contained in the package book. Meanwhile, there is no single teaching material from the lecturers as the guidance of students in the lecture. Teaching materials used are only from campus course book, and even with a limited number.

In order to make students easily understand the concept of Matrix Algebra course, it is necessary to develop teaching materials that can direct and stimulate students' thinking activities, so that the purpose of a learning process can be achieved. The selection and use of appropriate learning tools in the learning process are two important factors in guiding students to gain a learning experience. The way lecturers teach is closely related to the use of interesting and non monotonous teaching materials.

2 METHODS

The research method used is research and development method. The development research procedure used in this research is the procedure proposed by Blog and Gall (Trisnaningsih, 2007), namely: 1) conducting analysis of the product to be developed; 2) developing the initial product; 3) expert validation and revision; 4) field trials on a small scale and revision; and 5) large-scale field trials and end products.

The research instruments used are validation sheet, interview guide, learning observation sheet, student response scale sheet, teaching material performance assessment sheet, and description test. This instrument is validated by a team of experts with good results and has met the eligibility criteria for use in research.

3 RESULT

The results of this small-scale trial is a description of student responses, student interviews, and student test results. The students' response to the developed teaching materials has an average score of 51, 30 of the maximum score of 75. This indicates that the students agree to use compilation materials in the learning process of matrix algebra course.

In addition to generate a positive response, the use of teaching materials is also quite effective to improve student learning outcomes. This is evident from the results of the student description test using the teaching materials. It has an average score of 6.30 from the total score of 10. It also means compilation material is quite effective to use in the learning process of matrix algebra course.

Based on the aforementioned materials, the developed teaching materials have met the practical and effective criteria on small-scale trials.

The result of field test shows that students respond positively to the use of teaching materials in learning the matrix algebra course. The response is in the range of 52% - 64%. Thus, the students respond well and agree on the use of teaching materials on the matrix algebra course lecture.

In addition to positive student response data, comparing the performance of the use of teaching materials in the learning process addresses the level of practicality and effectiveness. The use of compilation materials is better than learning without using compilation materials. Percentage of performance shows comparison on learning matrix algebra course before and after using teaching materials.

Based on the calculation, the average value of the effectiveness of learning without using teaching materials is 39%. Meanwhile this value is lower when compared to the average of the effectiveness of learning using teaching materials that is 68%. It is

evident that the effectiveness of learning using compilation materials in matrix algebra course is higher than that of learning without compilation materials

D. Conclusions

Based on the formulation of the problem, data processing, and data analysis some conclusions obtained from the results of this study include:

1. Both on small-scale test results and field trials, students respond well to the use of compilation materials.
2. The effectiveness of the use of compilation materials when viewed from the practical aspect of learning, interest in learning, and the success of learning is better than the effectiveness of learning without using compilation materials.

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