

DEVELOPING PROBLEM-BASED LEARNING MODULE TO IMPROVE THE FOURTH-GRADE STUDENTS' LEARNING ACHIEVEMENT MOTIVATION

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ABSTRACT

The purposes of the study were to: 1) Develop a problem based learning module for the fourth-grade students, and 2) Discover the feasibility of the learning module. This study was conducted by using Research and Development (R&D) as proposed by Borg and Gall (1983). In the field test stage, 52 fourth-grade students were involved as participants in an experimental design. The participants were divided into two group, while one group conducted learning by implementing the PBL Module, the other group conducted learning on regular basis with textbook from the government. The qualitative data were analyzed using qualitative method, and the quantitative data were analyzed by using Wilcoxon test. The results of this study reveal that: 1) The PBL Module was developed in accordance with PBL syntax; 2) The results of the development PBL modules was feasible to be applied. The feasibility of PBL Modules based on the expert validation, validation of practitioners, and small-scale trial respondents obtains the "Good" category; 3) PBL-based modules are effective for increasing students' achievement motivation as indicated by the Wilcoxon test producing obtained probability (p) of 0.027 ($p < 0.05$), H_0 is rejected, so there are differences in achievement motivation before and after using the PBL module. Based on the research results it can be concluded that the characteristics of PBL-based modules are in accordance with PBL syntax; Decent and effective way to increase achievement motivation of the fourth-grade students.

Keywords: module; problem-based learning; achievement motivation.

INTRODUCTION

The rapid development of science and technology is as one of big impacts of globalization. It brings changes in almost aspects of life, one of them is that of education. The emerging various kinds of technology as a result of human work indicate the increasingly rapid global competition. The rapid development of the globalization era is closely related to the world of education, especially active, creative, and innovative learning to improve and develop the quality of human resources.

Quality education produces human resources who are able to compete and develop science and technology through the learning process. The current learning system is a transition from teacher-centered learning paradigm to student-centered learning. Changes in the learning paradigm make students more active, creative, independent, motivated, able to develop skills and thinking abilities, and able to solve a problem that arises in learning. Quality education must be supported by a good education system. Education in schools is closely related to the quality of learning carried out by teachers and students at the classroom level.

One important factor influencing the quality of learning is facilities-supported learning in the form of teaching materials (Widoyoko, 2012) that can combine students' experiences and knowledges. The ideal teaching materials, according to Toharudin (2011), must contain illustrations that attract students, stimulate their personal activities to be independent, be aware and be strict in order to avoid the same and unusual concepts so as not to confuse them; in fact, it can motivate, and attract the interests of students who use it. The constructivist approach is the most important thing in teaching materials because this kind of approach makes students can build their own knowledge concepts and concept discoveries.

The use of teaching materials makes the learning process of teaching more meaningful. The readability aspect is that language in teaching material is difficult to understand and the language used is less communicative, so the material is difficult to understand and must be read over and over again. The aspect of color display is the displayed color of the image that does not match the original color. The aspect of evaluation questions is only about the problems in teaching materials so that they are not able to train and motivate students to think critically. In addition, mastery of learning materials at the elementary school level was generally not optimal.

Facts in the school showed that there are many students who have score below Minimum Completeness Criteria in grade IV. The value below Minimum Completeness Criteria showed that the learning was dominated by the use of lecture methods, the level of students' activity was lacking, their activities were limited to listening activities, and noting things that were considered important (conceptual giving), teaching materials make them less motivated to excel at school. Learning will be more effective if supported by modules that encourage students to develop new ideas to solve problems. Learning should involve them in direct experience to develop their competencies and be motivated to excel, so students can understand and master the concepts of learning material and overcome the problems they face.

Based on the description above there is a gap between ideal conditions and facts, so it is needed for learning modules that support students' direct experience activities to solve a problem. Teaching and learning activities supported by independent learning modules can encourage students to be motivated to excel. Modules in the form of learning books are designed to help students learn independently with learning experiences that systematically designed. So that, the module is a learning medium that is easy for students to learn to achieve learning goals by exploring all abilities within him. Based on this understanding, the

module is an innovative teaching material in the form of an independent package book that has been systematically designed with the aim of helping students in learning activities. Among innovative learning models, that can increase students' learning achievement motivation, is problem-based learning. This is a learning model that uses real problems as a focus of student attention to think about cause and effect so that solutions can be formulated. Through this procedure, students gain essential knowledge and concepts from the material being studied. The syntax of problem-based learning includes: stage 1) student orientation to the problem; stage 2) organizing students to learn; stage 3) guiding individual and group investigations; stage 4) developing and presenting the work; stage 5) analyzing and evaluating the problem-solving process.

Problem-based learning modules need to be applied in classroom so that students are motivated to achieve the highest achievements. The modules train students to demonstrate their ability to solve a problem, so as to increase their achievement competency and motivation. Through the problem-based learning model, it is hoped that the learning process will be more fun and make students excited in follow the learning process and motivated to excel at school. Achievement motivation are a person's hard work to be able to conquer the difficulties faced by increasing self-proficiency as high as possible in all activities, using standards of excellence as a comparison. Based on the problems and statements outlined above, it is necessary to conduct a study about developing a module based on problem-based learning to improve achievement motivation.

Based on the background description that has been stated above, the formulation of the problems that become the main research is:

1. How do develop the eligible learning module based on problem-based learning for the fourth-grade students in elementary school?
2. How do discover the feasibility of the module?

Based on the formulation of the problem stated above, the researcher sets several objectives of the study: 1) Develop the eligible learning module based on problem-based learning (PBL) for the fourth-grade students in elementary school, and 2) Discover the feasibility of the learning module

Knowing the characteristics of the module based on problem-based learning to improve achievement motivation of fourth grade students at SD Sribit.

1. Test the feasibility of module based on problem based learning to increase achievement motivation of fourth grade students at SD Sribit.
2. Test the effectiveness of module based on problem based learning to improve the achievement motivation of grade IV SD Sribit students.

Theoretical Benefits: (a) The problem based learning model encourages students to learn to use real problems, so they can learn concrete knowledge and obtain problem solving; (b) The use of problem based learning models in learning, provides a variety of information about innovative learning models that can increase student achievement motivation in the future; (c) The use of problem based learning models can make students accustomed to thinking critically in solving problems in learning material, so that the learning process attracts students' interest in learning and increases student achievement motivation.

Practical benefits: (a) For Students; Accustom students to think critically to solve problems in learning, Generating student achievement motivation in school, Accustom students to learn actively and creatively; (b) For Teachers; As input for teachers in choosing alternative learning models that can increase learning participation and increase student understanding in learning; (c) For Schools; The results of this study as input to the school to

pay attention to improving critical thinking skills and student achievement motivation in learning activities carried out in school.

RESEARCH METHOD

Research Design

The procedures of problem based learning modules were developed by Borg and Gall (1983) about Research and Development Stages. The procedures of this research includes R&D steps are presented in Figure 1.

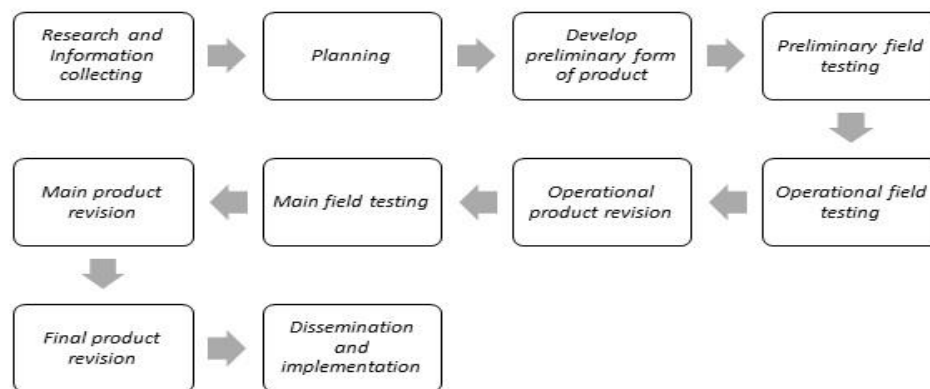


Figure 1. R&D Steps by Borg & Gall

Participant

The field testing of the product was conducted in SD Srimbit, Bantul, Yogyakarta. The product was implemented in regular learning during the odd semester in September 2019 to November 2019. The school involved in this research are located in the remote area of Bantul District. There are several considerations used by the researcher in selected the school involved such as

The physical environment of the school was quite good. The researchers see how they organize and maintain classrooms, teacher's room, principal's room, and other spaces.

The participants involved in this study are 52 fourth-grade students in Sribit Elementary School, Bantul, Indonesia. The participants are divided in two group as experimental group and control group. The experimental group consist of 27 students and the control group consist of 25 students. While the experimental group were conducted learning by implementing the PBL Module, the government textbook was used in the control group.

Data Collection

The data is collected by several instruments: (1) module identification sheet, (2) validation sheet, (3) student achievement motivation questionnaire, (5) observation sheet of the syntax implementation of module use, and (6) pretest and posttest

Data Analysis

There are two types of data collected in this research. Therefore, the analysis strategies used depend on the type of the data. The qualitative data were analyzed qualitatively using qualitative data analysis. The quantitative data were analyzed by Wilcoxon test and T-test.

RESULTS AND DISCUSSION

Results

The descriptions of the result of this research and development are presented based on each stage of research and development processes.

A problem was found based on the results of the needs analysis. It was the use of teaching materials that did not support the success of learning in terms of material aspects, readability aspects, teaching material display aspects, and evaluation questions aspects. Based on these problems, it was known the fact and ideal conditions of teaching materials so that the right solution is the need for developing modules that support students' direct experience activities to solve a problem. Learning supported by independent teaching materials can encourage students to be motivated to excel.

The initial field trial phase includes the stage of the development research validation process which consists of three expert validators, one fourth-grade teacher validator, and a small-scale trial with 10 students. Validation assessment consists of material, readability, and learning tools. The following results of the initial field trials can be seen in Figure 2.

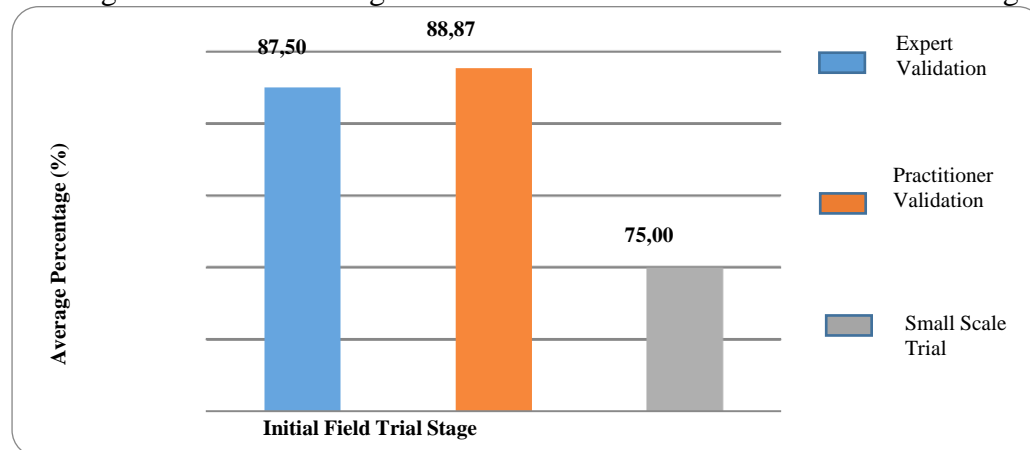


Figure 2. Histogram Results of Average Percentage of Initial Field Trials

The data in Figure 2 shows that the results of the validation of experts and practitioners implementing the fourth-grade elementary school teachers received an assessment that the module is included in the category of "Good". The assessment of the results of the responses of 10 students through a questionnaire obtained an assessment that the module included the category of "Good".

Based on the results of the achievement motivation questionnaire before and after the use of PBL modules from 27 IVA class students (experimental class) and 25 IVB class students (control class) were obtained in the following results.

After calculating the average results of achievement motivation, then a prerequisite test was performed. The following is the results of the prerequisite test of class IVA achievement motivation.

The data in Table 1 above note that the prerequisite tests for before and after the results of learning motivation were abnormally distributed values before learning but the data after learning were normally distributed, and not homogeneous. From the prerequisite test data, it could be determined that the follow-up test used a non-parametric test that was the Wilcoxon test to determine whether there was a difference in the use of modules based on problem-based learning. The results of the analysis with the Wilcoxon class IVA test are presented in Table 2.

Table 1. Prerequisite Test Results for Class IVA Achievement Motivation

| Test | The Results | Conclusion | Decisions |
|--------------------|--|----------------------------|-----------------------------------|
| Normality | Sig before= 0.006 Sig after = 0.200 | Ho rejected Ho received | Data is not normal Normal Data |
| Homogeneity | Sig = 0.000 | Ho rejected | Data is not homogeneous |

Table 2. Analysis Results of Class IVA Wilcoxon Test

| Test | The Results | Conclusion | Decisions |
|-----------------|------------------------------------|-------------|--|
| Continue | $t_{calc} = -2.201$ $p = 0.027$ | Ho rejected | Results are not the same (there is a difference) |

From the results data obtained in class IVA, it can be concluded that students' achievement motivation has increased after learning using a module based on problem-based learning.

From the results data obtained in class IV B, it could be concluded that students' achievement motivation has increased after learning using a module based on problem-based learning. After calculating the average results of achievement motivation, then a prerequisite test was performed. The following are the prerequisite results of the VB grade achievement motivation test.

Table 3. Results of the Prerequisite Tests for Class IVB Achievement Motivation

| Test | The Results | Conclusion | Decisions |
|--------------------|--|----------------------------|-----------------------------------|
| Normality | Sig before= 0.200 Sig after = 0.013 | Ho accepted Ho rejected | Normal Data Data is not normal |
| Homogeneity | Sig = 0.000 | Ho rejected | Data is not homogeneous |

The data in Table 3 above notes that the prerequisite tests for before and after achievement motivation results were normally distributed before learning but after learning data were not normally distributed, and were not homogeneous. From the prerequisite test data, it could be determined that the follow-up test used a non-parametric test that is the Wilcoxon test to determine whether there was a difference in the use of modules based on problem-based learning. The results of the analysis with the Wilcoxon class IVB test are presented in Table 4.

Table 4. Results of Analysis of Wilcoxon Test Class IVB

| Test | The Results | Conclusion | Decisions |
|-----------------|---------------------------------|-------------|--|
| Continue | t calc = -2.201 p = 0.027 | Ho rejected | Results are not the same (there is a difference) |

From the results data obtained in class IVB, it could be concluded that students' achievement motivation has increased after learning using a module based on problem-based learning.

The researchers obtaining the cognitive learning test results based on the pretest and posttest scores of the PBL modules used from 27 students in class IVA (experimental class) and 25 students in class IVB (control class) are presented here.

After calculating the average scores of cognitive learning outcomes, then a prerequisite test was performed. Following here the prerequisite results of cognitive learning outcomes for class IVA.

Table 5. Prerequisite Test Results for Class IVA Cognitive Learning Outcomes

| Test | The Results | Conclusion | Decisions |
|--------------------|--------------------------------|-------------|---------------------|
| Normality | Sig <i>pretest</i> = 0.200 | Ho accepted | Normal Data |
| | Sig <i>posttest</i> = 0.074 | Ho accepted | Normal Data |
| Homogeneity | Sig = 0.648 | Ho accepted | Data homogeneous |

The data in Table 5 above notes that the prerequisite tests for pretest and posttest cognitive learning outcomes were pretest and posttest data normally distributed, as well as homogeneous data. From the prerequisite test data, it could be determined that the follow-up test used a parametric test that is the T (Paired Sample T-Test) test to determine whether there were differences before and after the used of module based on problem-based learning. The results of the analysis with the class IVA T test are presented in Table 6.

Table 6. Analysis Results of Class IVA T Tests

| Test | The Results | Conclusion | Decisions |
|-----------------|-----------------------------------|-------------|--|
| Continue | t calc = - 10.496 p = 0.000 | Ho rejected | Results are not the same (there is a difference) |

From the data obtained in class IVA, it could be concluded that the value of students' cognitive learning outcomes before used PBL modules were different from the cognitive learning outcomes of students after the used of PBL modules, and has increased after learning by using problem-based learning modules.

After calculating the average value of cognitive learning outcomes, then a prerequisite test was performed. Following here the prerequisite test results for IVB class cognitive learning outcomes.

Table 7. Prerequisite Test Results for Cognitive Learning Results for Class IVB

| Test | The Results | Conclusion | Decisions |
|-------------|-----------------------------|-------------|------------------|
| Normality | Sig <i>pretest</i> = 0.577 | Ho accepted | Normal Data |
| | Sig <i>posttest</i> = 0.426 | Ho accepted | Normal Data |
| Homogeneity | Sig = 0.925 | Ho rejected | Data homogeneous |

The data in Table 7 above notes that the prerequisite tests for pretest and posttest cognitive learning outcomes were pretest and posttest data normally distributed, as well as homogeneous data. From the prerequisite test data, it could be determined that the follow-up test used a parametric test that was the T (Paired Sample T-Test) test to determine whether there were differences before and after the used of module based on problem-based learning. The results of the analysis with the class IV B T test are presented in Table 8.

Table 8. Results of Analysis of Wilcoxon Test Class IV B

| Test | The Results | Conclusion | Decisions |
|----------|-------------------------------|-------------|--|
| Continue | t calc = - 4.290 p = 0.000 | Ho rejected | Results are not the same (there is a difference) |

From the results data obtained in class IVB, it could be concluded that the value of students' cognitive learning outcomes before used PBL modules was different from the cognitive learning outcomes of students after the used of PBL modules, and has increased after learning used modules based on problem-based learning.

Discussion

The Eligible Learning Module Based on Problem Based Learning for The Fourth-Grade Students in Elementary School

The problem-based learning module is one of the teaching materials that have characteristics of problem based learning: a) student orientation to the problem; b) organizing students to learn; c) guiding individual and group investigations; d) developing and presenting the work; e) analyzing and evaluating the problem-solving process (Arends, 2008: 46).

The problem-based learning module has its own characteristics that distinguish it from other modules. The characteristics of problem-based learning module are developed integrated with the stages of problem-based learning because students must be actively involved in the learning process. The teacher is not just about transferring knowledge. The teacher is only as a facilitator providing problems and as a student mediator to be able to construct their own knowledge. Although the teacher's role in problem-based learning sometimes also involves presenting and explaining various things to students, but more often functions as a guidance and facilitator so students can learn to think and solve their own problems. Problem-based learning module train students to demonstrate their ability to solve a problem, so as to increase student achievement competency and motivation. Through this learning model it is hoped that the learning process will be more fun and make students excited in following the learning process and motivated to excel in school.

The Feasibility of Problem-Based Learning Module Increase Achievement Motivation

Problem-based learning module is validated by three expert validators, one validator module implementation practitioners, and a small-scale test of 10 students. Expert validators and implementation practitioners who validate modules consist of module material experts and learning device experts. The module feasibility test phase is carried out aiming to obtain suggestions, criticisms, and constructive input from the validator and students. After validating, the next step is a module I stage revision is carried out based on suggestions, criticisms, and input.

Based on the results of the validation obtained, expert validators and implementation practitioners provide an assessment of the module, which is a problem-based learning module included in the category of "Good", and an assessment of 10 students to the module is also included in the category of "Good". From the results of the validation, it can be concluded that the modules based on problem-based learning is ready to be used for the next stage (main field trials/effectiveness). However, there are still some suggestions and input from the validator to be improved. Improvements based on suggestions and input on module materials related to examples of natural appearance phenomena, as well as language writing according to Enhanced Spelling (EYD) need to be considered and must be consistent. The problem-based learning modules has been revised based on suggestions and input so that the module is eligible and can continue at the main field/effectiveness test stage.

CONCLUSION AND RECOMMENDATION

Based on the description of the results of the study, it can be concluded that: (a) Research on product development problem-based learning module has characteristics that are in accordance with the syntax of problem-based learning including student orientation to problems, organizing students to learn, guiding individual and group investigations, developing and presenting work, analyzing and evaluating problem-solving processes; (b) The problem-based learning modules are feasible to use, evidenced by the expert validators and module validator practitioners obtained the "Good" category, and 10 students respondents get the "Good" category; (c) The problem-based learning modules are feasible to use, evidenced by providing a better average of outcomes compared to learning using textbooks that are commonly used in class.

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