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MODEL DEVELOPMENT RESEARCH-BASED LEARNING ON LEARNING COURSE IN FACULTY MIPA STATE UNIVERSITY GORONTALO

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Abstract

In the course of learning courses in the Department of Physics, still found a lack of readiness of students attend lectures, course management with information and discussion methods generally still tend to lead to the provision of information, so that learning is still dominated by the lecturer. On learning this, the idea of beginning college students is relatively less explored and considered, students tend to be passive, self-motivation of students to learn less, and the sharing of knowledge among students less facilitated. Though this course, it is very important for students in the Faculty of Science, where as a student teacher candidates should feel meaningful learning, all the more so for the course of science and learning provide skills to students as prospective teacher. This research aims to develop research-based learning model in the course of learning in the Faculty of Science of Gorontalo using *4-D Model* (four D Model) developed by Thiagarajan (1974) which consists of four stages, namely: (1) definition (define), (2) planning (design), (3) development (develop) (4) disseminate. The method used in this research is quantitative descriptive method. This study begins with the definition phase, the planning, development i.e. validation experts, revisions, and test one at the Department of Physical Education, the revision of the results of tests 1 and implementation models around existing courses in the Department of Physics. The results showed that the learning device composed by applying research-based learning model for Teaching and Learning course which consists of the Syllabus, SAP, Instructional Materials, MFI, Test Results Learning, valid based on the validation of three people validator, so the device is worth learning to use in the process of learning, especially learning courses on subjects teaching and learning.

Keywords: Learning tool, based learning research, and learning and learning

1. Introduction

Improving the quality of human resources (HR) is one of the main factors to improve the competitiveness of the workforce. Thus HR should be prepared to the fullest in order to have the ability, expertise, and skills that can be relied upon to enter the workplace. Improved the quality of graduate of education institutions is a real effort to improve the nation's competitiveness.

The learning process is the essence of education in colleges that have an impact on the quality of output. In lecture courses-learning courses in the Faculty of Science Education, found that the lack of readiness of students attend lectures, course management with information and discussion methods generally still tend to lead to the provision of information, so that learning is still dominated by the lecturer. Questions posed by lecturers can rarely be answered by the students or were answered by a particular student. Most of the lecturers answered questions posed by the lecturers themselves. On this learning, the idea of beginning college students is relatively less explored and considered in learning, students tend to be passive, self-motivation of students to learn less, and the sharing of knowledge among students less facilitated. Additionally, based on observations and interviews with students, during the

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1. Introduction

Improving the quality of human resources (HR) is one of the main factors to improve the competitiveness of the workforce. Thus HR should be prepared to the fullest in order to have the ability, expertise, and skills that can be relied upon to enter the workplace. Improved the quality of graduate of education institutions is a real effort to improve the nation's competitiveness.

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course on this learning process takes place in the same direction, namely lecturer explained and students sat listening. Still learning teacher-oriented so that less dynamic.

Even if there are variations of this lecture method, most lecturers use regular group discussion learning, and only a few specific students who are actively involved in the discussions and others sat down to listen, students did not reveal his participation in the learning process, the result is, although in general the students pass for this course but students do not experience a meaningful learning. Based on this, it is considered necessary to carry out a research-oriented learning model development. In this case the development of research-based learning model, where the model is considered appropriate to increase the activity and learning outcomes in the course of learning in the Department of Physics, Gorontalo State University. The objectives of the study are:

1. Knowing the quality of the learning device (consisting of Syllabus, SAP, textbooks, and tests Worksheet Student Learning Outcomes were developed using research-based instructional model that is integrated with character education. ¹
2. Knowing the implementation of the learning device by using a research-based learning model that is integrated with the educational character of the activity and learning outcomes Basic Physics student at the Gorontalo State University.
3. Knowing the interest and motivation of students to the implementation of the learning device by using a research-based learning model that integrates seamlessly with the character education ²

Research-based learning is a teaching method centered on learners that integrates research in the learning process. It is a ² multifaceted research-based learning, which refers to a wide variety of learning methods. Research-based learning provides opportunities for students to search for information, draw up hypotheses, collect data, analyze data, and make conclusions on the data that has been arranged; This applies in the ² learning activity with the approach of "learning by doing" (Widayati, et al: 2012). Therefore, research-based learning opportunities for the development of learning methods, among others:

- a. Renewal of learning (curriculum enrichment) by integrating the results of the research
- b. The active ² participation of students in the implementation of the research,
- c. Learning by using research instruments, and
- d. Inclusive development of the research context (students learn the procedures and the results of research to understand the intricacies of synthesis). ²

Some RBL models can be developed according to the characteristics of the study of science as well as the condition of the facilities available in the respective educational unit. PBR implementation strategy should really be considered that the effective implementation of the PBR and the PBR destination is reached.

2. Materials and Methods

This research included in this type of research development, because through this research will be developed learning model includes learning device in the course of learning in the Department of Physics. As for the design development of the device used is a 4-D model of development that developed by Thiagarajan, and Semmel Semmel (1974) (in Mulyatingsih, 2011). which consists of four stages, namely stage of definition (define), stage of planning (design), stage of development (develop), and Phase dissemination (disseminate).

¹ Subjects in this study were students of the Faculty of Mathematics and Science, Gorontalo State University are programmed courses teaching and learning interactions and strategies

Teaching and Learning. Collecting data in this study using observation, assessment of achievement test and questionnaire. Data analysis techniques used in this research is descriptive statistical analysis techniques, which describe the implementation of Lesson Plan (RPP) and student activities, completeness of student learning outcomes and student motivation.

Table 1. Steps of Development Activity

No	Activity	Description of Activities	Product
1	Drafting device by using a research-based learning model in the course of learning at the Department of Physics Education	The study of the theory and models of research-based learning in various references (books, journals, internet, research, and good practice)	Draft learning device by using a learning model research on the subject of learning.
2	Expert Test	Learning device by using a research-based learning model in the course of learning tested through expert assessment.	Learning device by using a research-based learning model in the course of learning, valid in theory
3	Test 1	Carry out trial limited to a few classes in physical education courses.	Analysis of the use of the learning by using research-based instructional model in the course of learning.
4	Revised models based on test results 1	Implement revisions based on the results of trials 1	Learning device by using a research-based learning model in the course of learning, effective
5	Implementation of the model	Carry out the test through experimental research and action research	Learning device by using a research-based learning model in the course of learning, effective
6	Dissemination	To disseminate learning tools through distribution in limited quantities to the faculty and students	Learning device by using a research-based learning model in the course of learning, effective

3. Results and Discussion

Preparation of Learning Device includes Syllabus, Events Unit Class (SAP), Instructional Materials, Student Activity Sheet (MFI), testing of Learning Outcomes (THB), Observation Sheet of Student Activities and Motivation Questionnaire.

3.1. Results

3.1.1. Learning Device Implementation in Classroom A, Department of Physics Education

3.1.1.1. Observations Outcomes of Learning Implementation

Observation of activities of lecturers achieves satisfactory results. Feasibility study conducted by the lecturers has been performing well since the criteria very well reach 99.86%.

3.1.1.2. Observations of Student Activities

Data from the student activity showed that of the 25 students, there is a 60% gain criterion very well, 28% gain well criteria, 4% gain sufficient criteria and 0.00% gain less criteria. This indicates that the students' activity observation has been successful, because student activity

is successful if it reaches 80% of aspects that are considered to have good or excellent value. Achievement of Student Activities for the criterion of good and very good at 88%.

3.1.1.3. Student Learning Outcomes

Based on the results of pre-test and post-test scores obtained by the average student results after learning by using research-based learning model student results are a comparison between before treatment (pre-test) and after treatment (post-test). This is indicated by the average score of post-test were larger than the average scores of pre-test of 8.96, while the average score of post-test is 24.64.

3.1.1.4. Students' Motivation toward Learning

Motivation questionnaire given to students contains positive statements and negative statements. Student learning motivation in participating in research based learning gained 3.26 categorized good values. They are diligent, tenacious, able to work independently, do not get bored on the tasks given Able to maintain their opinion, not easy to remove concepts that are believed, happy looking and solve a given problem.

3.1.2. Learning Device Implementation in Classroom B, Department of Physics Education

3.1.2.1. Observation Activities of Lecturer

Feasibility study conducted by a lecturer in conducting learning by using research-based learning has increased or managed by the criteria very well with the achievement of 100%. This is demonstrated by the data that of the 11 aspects of the lecturers were observed, obtained 95% of the criteria is very good, and 5% both criteria. Based on these data, it can be concluded that the feasibility study conducted by lecturer increased from the meeting of 1 (very good and a good 82%) to the second meeting (an excellent and well 100%).

3.1.2.2. Student Activities

Observation of student activities conducted by observers during the learning process takes place with 10 aspects of assessment. At this first meeting, the activity of the students to the criteria of good and excellent reaches 82.0%. While at the second meeting of the 25 students are 48.0% very good criteria, 50.0% good criteria, and 2.0% criterion sufficient. Student activity for good and very good criterion reached 98.0%. This means that there is an increase in students' learning activities from one meeting to the second meeting.

3.1.2.3. Student Learning Outcomes

Achievement percentage value of every aspect of cognitive student for 1 C2 86% meeting the criteria very well (A-), C3 78% good (B-), C4 79% good (B). In the cognitive aspect Very Good C2 reaches criteria because many students who answered correctly. 2 meeting student achievement value to every aspect of 88.5% kignitif C2, C3 74.4%, 88.5% C4 and C6 level of 79.6%. It can be concluded that student learning outcomes at the meeting II increased.

3.1.2.4. Motivation Student Learning

To see how the motivation of students to the application of research-based learning, the learning of students before and after questionnaires distributed according to the number of students is 23 people. The average score before applying research-based learning model

reaches 3.17 (both categories). This means that students in implementing research-based learning have good motivation.

3.1.3. Learning Device Implementation in Classroom C, Department of Physics Education

3.1.3.1. Observations Activity of Lecturer, Meeting I

Teaching and learning process in particular has a maximum lecturers activities, it can be seen from the percentage of implementation of the achievement of the learning activities are all already entered the category of very good and excellent. Thus, it can be concluded that the implementation of learning by using Learning-Based Research (PBR) is good

3.1.3.2. Results of the first meeting of the Student Learning Activities.

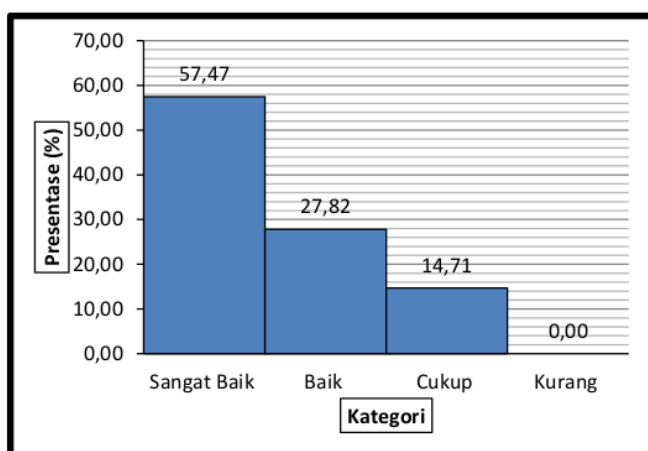


Figure 1. Histogram-Results of The First Meeting Of The Student Learning Activities

3.1.3.3. Students' Learning Motivation towards Learning on First Meeting

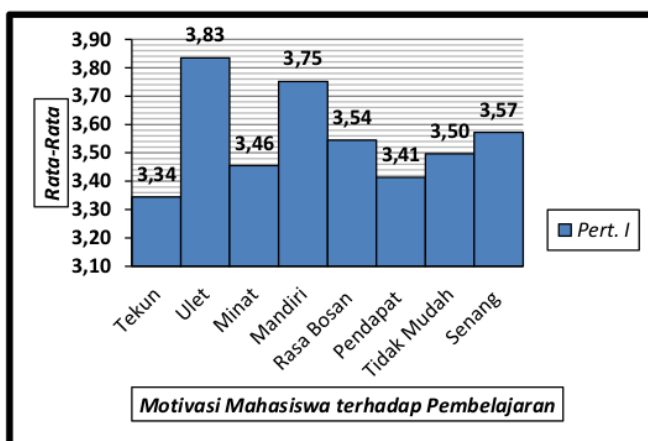


Figure 2. Histogram-The Average Of Students' Learning Motivation Towards Learning On First Meeting

3.1.3.4. The Result of Lectures Activities Observation

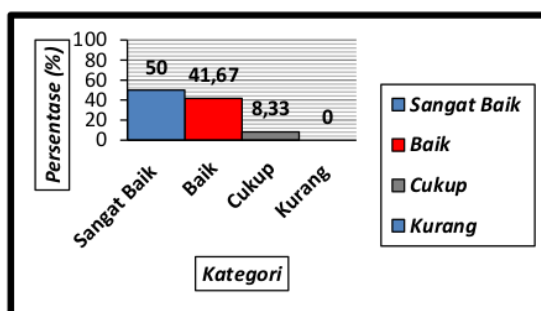


Figure 3. Diagram-The Result of Lectures Activities Observation Along The Teaching And Learning Activities On Second Meeting

Based on the diagram above showed that the implementation of learning by using Research based Learning is effective.

3.1.3.5. The result of Students' Activities Observation in Learning Process

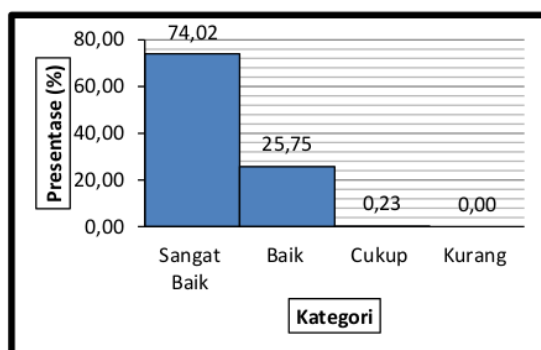


Figure 4. The Result of Students' Activities Observation in Learning Process of Second Meeting

Therefore, it can be concluded that the students' activity in first meeting has maximal.

3.1.3.6. Students' Learning Motivation in Learning Process

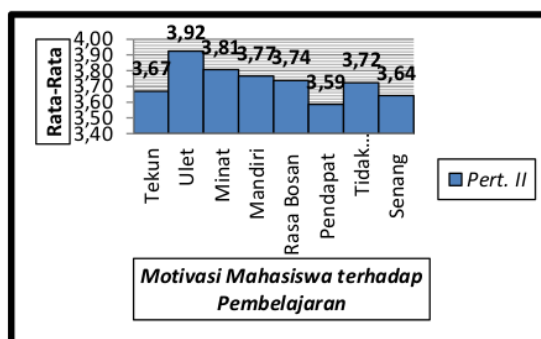


Figure 5. Histogram-The Averages of Students' Learning Motivation Toward Learning on Second Meeting

3.1.3.7. Student Learning Outcomes

The percentage of students who reach KKM (completed) reached 93.33% and which did not reach KKM (not complete) 6.67%.

3.2. Discussion

¹Based on the research and analysis of the data showed that the use of models of research-based learning can improve student learning outcomes of class A, B, and C, Department of Physics Education, Gorontalo State University. This can be seen from the analysis of student results conducted for 2 cycles of learning, where students' learning outcomes on the second cycle increased rather than in cycle 1. Therefore, it is proven that the models of research based learning, especially in material of Behaviorism Learning Theory and Learning Theory of Constructivism. This is because it is supported by student learning motivation. Motivation to learn the students during the research-based learning falls into both categories. In addition, based on the observation of activities of lecturers and students from the first meeting until the meeting II has increased from meeting to the next meeting. Based on this, it can be concluded that the models of research based learning can enhance the activity of lecturers and students. The higher activity of students in the higher learning student results.

This shows that research-based learning can help students in the learning process of students, so that students' ability can be trained. By applying the concept of research-based learning obtained by students will stick in his mind a long time since the acquisition of knowledge of students based on a case which aims to preserve the memory of students. This is in line with that proposed by Diah (2010: 7) that the benefits of research-based learning model that learners experience the development and improvement of capabilities and competencies higher, including for example the general competence to think critically and analytically, evaluating and troubleshooting information. The condition has a positive impact on student learning outcomes as shown by the average scores of students after being treated by applying research-based learning.

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