LEARNING MODEL DEVELOPMENT REFERRING TO THE 2P3 LEARNING MODEL (Thinking, sharing, observing, presenting, reporting) IN BASIC

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ABSTRACT:

This study aims to develop learning tools that refer to the learning model with P3 which is valid, practical and effective. The method in this research refers to development research using the 4-D development model (define, desing, develop, and disseminate) from Thiagarajan. But the research has not done the dissemination of the results of device development the products of this research are in the form of Semester Implementation Plans (RPS), Teaching Materials, Student Worksheets (LKM), and Learning Outcomes Test (THB). The results show that 1) learning tools that refer to the Ber2P3 learning model include RPS, Teaching Materials, LKM and learning outcomes tests are in the good category. 2) Student response in lectures using the Ber2P3 learning model is good. From the results of these studies,

KEYWORDS: Ber2P3 learning model, basic physics

INTRODUCTION:

Science is knowledge obtained through learning and proof or knowledge that covers a general truth of natural laws that occur, for example, obtained and proven through scientific methods. Science in this case refers to a system for obtaining knowledge that uses observation and experimentation to describe and explain phenomena that occur in nature. Furthermore, Suastra (Ali, et al. 2013.2) explained that science learning is an ideal way to acquire competencies such as skills, maintaining attitudes and developing concepts related to everyday experiences.

Concept is defined as a tool used to organize knowledge and experience into various categories (Arends, 2012: 324). Mastery of concepts is an understanding that not only remembers the concepts that have been learned, but is also able to put them back into other forms or in their own words so that they are easy to understand, but do not change the meaning (Purwanto, 2012: 44).

Science learning in schools tends to emphasize memorizing concepts in the learning process, so that there are students who use memorization methods to overcome learning difficulties. Students do have a number of knowledge, but that knowledge can only be obtained from the teacher without them being able to find their own concept of knowledge. Science process skills (KPS) can provide opportunities for students to discover their own scientific concepts by making hypotheses, observing, concluding and communicating.

Science process skills (KPS) is an approach that emphasizes facts and conceptual approaches used in science learning which is based on activity steps in testing things that scientists usually do when building and proving a theory. In science process skills make it possiblecollege student feel the nature of science and make them skilled in activities related to science. KPS is very important to be developed in learning physics, it is expected to be able to help students to find facts, build concepts and theories that refer to the process. This opinion is supportedWiranata (2013; 3) Process skills possessed by students have a big impact on learning outcomes. This is in line with the opinion of Avianti & Yonata (2015: 225) that the advantage of science process skills is that they can make students creative, active, skilled in thinking and skilled in acquiring knowledge.

The results of researchers' observations on learning outcomes in basic physics courses, especially elasticity material and Hooke's law, found that the learning outcomes of lectures were not satisfactory, especially science process skills, this needed to be addressed immediately, because it would affect the quality of graduates, as prospective teachers and the quality of learning that would be applied.

Based on the results of interviews with students who have carried out basic physics courses, practicum activities have not been able to train science process skills such as formulating problems, formulating hypotheses, designing experiments, drawing conclusions and other activities that can train science process skills.

Based on the description above, it is necessary to do an in-depth study of the implementation of lectures on the concept of elasticity and Hooke's law. Therefore, the development of a lecture model is very necessary in order to improve the quality of the lecture process to produce better prospective physics teachers. In this study, researchers developed the Predic, observation, and exploration learning model to train physics students' science process skills on the concept of elasticity and Hooke's law. The learning model is the Ber2P3 learning model (thinking, sharing, observing, exposure, reporting).

The Ber2P3 learning model is specifically designed to change the atmosphere of learning to make students interested in taking part in learning and can improve students' critical thinking skills based on constructivism.

RESEARCH METHODS:

The research carried out is RnD (research and Development), which is a research process that examines the needs of users then develops products to meet these needs, namely producing learning products in the form of RPS, teaching materials, LKM, and learning outcomes tests. This research development model adapts the Thiagarajan development model known as the 4 - D model which consists of the Define, Design, Develop, and Dessiminate stages (Sugiyono 2016).

Data collection in this study was carried out through validation (validation of experts and practitioners), interviews, observation, documentation, distribution of questionnaires and tests which were assisted by research instruments to obtain data so that the learning tools developed were valid, practical and effective. Next is to analyze the data using data analysis techniques as follows 1) validation of learning tools, 2) student activities, 3) analysis of student responses, 4) analysis of learning outcomes tests.

Types of research:

This research is a development research (Reseach and development) in the field of education. Because it focuses on developing the Ber2P3 learning model.

Time and Place of Research:

This research was conducted in the Department of Physics, Faculty of Mathematics and Natural Sciences, State University of Gorontalo, in the odd semester of the 2020/2021 academic year

Research Targets / Subjects:

The research subject was the Ber2P3 learning model in basic physics learning 1. The test subjects were semester 1 students of physics education study program, Faculty of Mathematics and Natural Sciences, State University of Gorontalo.

RESEARCH RESULTS AND DISCUSSION:

The define stage:

The define stage includes front end analysis, student analysis, task analysis, concept analysis and learning objectives formulation activities. Learning devices that refer to the 2P3 learning model are developed based on the results of preliminary studies in the form of needs analysis. The results of the front end analysis show that the problem in developing the Ber2P3 learning model is that in the implementation of basic physics learning 1 still involves cognitive aspects, still less involving students in learning.

Whereas in the student analysis it was found that based on the results of the interview, it was found that the background of the lecture participants on the concept of elasticity and Hook's law originating from different cognitive levels. . Mentally, a child can describe objects and events and can solve a problem with this description. Learning that is designed and implemented not in accordance with the abilities and characteristics of students will have no meaning for students.

Task analysis aims to identify the main tasks that will be carried out by students. Task analysis consists of analyzing the learning outcomes of the study program.

Concept analysis aims to determine the content of the material in basic physics 1 subject elasticity and Hooke's law using the Ber2P3 learning model.

Design Stage:

At the design stage, an initial design of the Ber2P3 learning model was generated. In addition, this stage includes the activity of determining tests, learning media and learning device formats as well as appropriate instruments based on the results of the front end analysis.

The results of the design stage are the design of the Ber2P3 learning model and the accompanying learning tools by referring to the characteristics of the learning model proposed by Bruce and Weil (1992: 135-136) which includes the syntax of the Ber2P3 learning model, social systems and reaction principles, support systems, as well as the instructional impact and accompaniment impact.

Develop Stage :

At the develop stage, data was obtained about the validity, practicality, and effectiveness of the application of the Ber2P3 learning model. Validity refers to the expert's assessment of the Ber2P3 learning model book, practicality refers to the implementation of the Ber2P3 learning and student responses to the application of the Ber2p3 learning model, while effectiveness refers to the activities and learning outcomes of students after participating in learning using the 2P3 learning model.

At this development stage, the Darf 1 learning device was developed and evaluated until finally tested. The resulting devices are:

1. RPS:

Following are the validation results of several VAs, the idators for the semester lecture plan (RPS)

Table 2. Results of the RPS validation for the Ber2P3 learning model

No.	Syllabus components	Validator Value			Component mean	Category
		V1	V2	V3		
1	TP formulation	4.20	4.20	4.80	4.40	SV
2	Contents served	4.60	4.20	4.80	4.53	SV
3	Language	4.30	4.30	4.30	4.30	SV
4	Time Allocation	4.50	4.50	4.50	4.50	SV
The number of all components		17.60	17.20	18.40	17.73	
Component mean		4.40	4.30	4.60	4.43	SV

Table 2 shows that the results of the RPS validity test for each categorized aspect are very valid. The RPS component aspects which include the completeness of the RPS components, learning activities, language and time location are appropriate and can be said to be very valid by obtaining an average validity value of 4.43 which means that the RPS component is feasible to be applied to basic physics lectures 1

2. Teaching Materials:

The assessment that has been carried out by 3 validators is carried out to determine the validity and feasibility of the teaching materials that have been developed. The results of the assessment of the validity of teaching materials that have been carried out by the 3 validators are described in table 3

Table 3. Results of the validity of teaching materials

No.	Instructional Material Components	Validator Value			Component mean	Category
		V1	V2	V3		
1	The structure of teaching materials	4.30	4.7	4.30	4.43	SV
2	Material writing organization	4.50	4.50	4.50	4.50	SV
3	Language	4.70	4.70	4.70	4.70	SV
The number of all components		13.50	13.90	13.5	13.63	

Based on table 3, it can be seen that the assessment that has been carried out by validator 1, validator 2, and validator 3 on average for all components of the assessment reaches 4.54 which means that the teaching materials that have been developed are very valid so that they are feasible to be applied in basic physics courses especially in material of elasticity and Hooke's law.

3. Validity of Student Worksheets (LKM):

The quantitative data obtained is in the form of an expert assessment score on the validity of the MFI which is then converted into qualitative data to determine the criteria for the validity of the LKM. The following are the validation results of several validators for student worksheets (LKM).

Table 4. Validation results of Student Worksheets

No.	LKM component	Validator Value			Component mean	Category
		V1	V2	V3		
1	Contents served	4.2	4.7	4.30	4.40	SV
2	Language	4.3	4.50	4.50	4.43	SV
3	Time Allocation	4.20	4.60	4.50	4.43	SV
The number of all components		12.7	13.8	13.3	13.3	13.27
Component mean		4.2	4.6	4.4	4.4	4.42

Based on table 4, it can be seen that each validator gave an assessment in terms of the content presented, an average of 4.40 in terms of use, an average of 4.43 and in terms of time allocation reached 4.43. Based on the results of the validation by several validators, there are several suggestions for improving the MFI

The results of the validation of the experts on the student's cognitive science process skills and THB tests are presented in the following table:

Table 5 Validation Results of Science Process Skills and THB Cognitive Tests

No.	Type of Test	Validation Results		
		Validator 1	Validator 2	Validator 3
1	Science process skills tests	RK	RK	RK
2	THB Cognitive	RK	Rk	RK

Based on Table 5, it can be seen that the three validators provide an assessment of the content validity in the science process skills test and student THB with a small revision assessment, which means that both tests are suitable for use in research. Based on the results of validation by several validators, there are several suggestions and improvements to the science process skills test and cognitive learning outcomes tests such as the following:

Table 6 the results of the revision of the Science Process Skills Test and THB based on the validator's suggestion

Type of Test	Before the Revision	After the Revision
KPS test	Clarify the formulation of Test Sentences for each skill indicator	The formulation of the test sentences for each sentence of the test is clear
Cognitive Tests	The test is formulated according to the indicators on the RPS	The formulated test is in accordance with the indicators on the RPS
	Improvements to each item of question formulation	In each item the question formulation has been corrected

The practicality of the Ber2P3 learning model is shown by data on the implementation of the lecture process and data on student responses to the application of the Ber2P3 learning model in the material Elasticity and hooke law.

Implementation of the lecture process:

Lecture implementation data by applying the Ber2P3 learning model is obtained through the observation sheet on the implementation of the Ber2P3 learning model, where observations are made for three meetings.

At meeting 1, meeting 2 there were still some learning steps that were not carried out. This is due to the adjustment of lecturers in managing time and the Ber2P3 learning scenario. At the 3rd meeting all division steps are carried out. The average implementation of learning Ber2p3 from meetings 1 to 3 reached 95% or the category is very good.

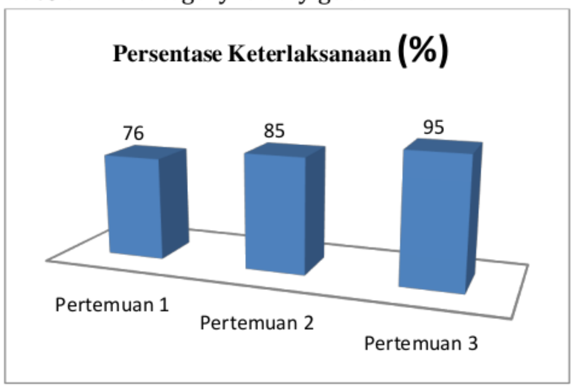

Figure 1 Percentage of Learning Implementation

Based on Figure 1, it can be seen that at the 1st, 2nd meeting, there were still some learning steps that were not carried out, this was because the lecturers were still adjusting the time to the new learning model. At the 3rd meeting all learning steps were carried out. The average Ber2P3 learning delay from meeting 1 to meeting 3 reached 95% or the category was very good.

Student response data to the application of the Ber2P3 learning model in Basic Physics 1 lectures were obtained through student response questionnaires that were distributed after students participated in the learning process three times using the Ber2P3 learning model.

In Figure 2, the results of the analysis of student responses to the application of the 2P3 learning model in Basic Physics 1 lectures in a limited trial class are given below.

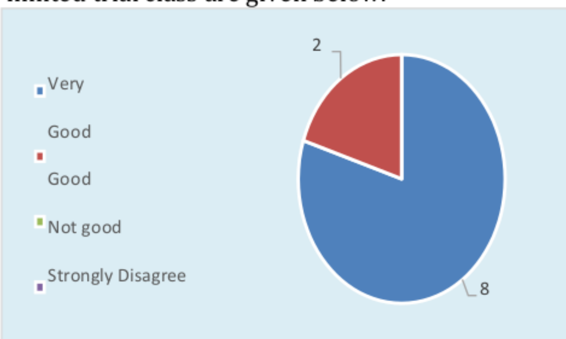

Figure 2 Percentage of Student Responses in Limited Trial Classes

Based on Figure 2 above, it can be seen that 80% of students or 16 students responded very well to the application of the Ber2P3 learning model, while the other 20% or 4 students responded well. There were no students who gave bad responses or very bad responses to the implementation of the Ber2P3 learning model. This means that it is considered as a student response, a learning model Ber2P3 is said to be effectively used in the process of Basic Physics 1 lectures.

The results of the questionnaire analysis generally show that students enjoy participating in the learning process using the Ber2P3 learning model, where by using the 2P3 learning model students are more active in the learning process, so they are more motivated to study the elasticity material and Hooke's law. This certainly makes it easier for students to understand the elasticity material and Hooke's law so that they can complete the exercises and tests given.

Development Model Effectiveness:

Indicators to see the effectiveness of the development model are learning activities and student learning outcomes.

1. Learning activity:

Student learning activities observed in trial 1 were only carried out on 19 people in 3 meetings while applying the Ber2P3 learning model to basic physics learning. The average student learning activities from meetings 1, 2 and 3 for the activity of asking questions 81, 40 were categorized as SB, make hypotheses 75.73 in category B, activity designing experiments 78.45 in category B, making observations 75.51, category B, doing experiments 78.23 in good category, communicating 87.52 in good category, calculation 87.52 in good category, interpreting data 83, 40, making a conclusion 68.48 categorized as good.

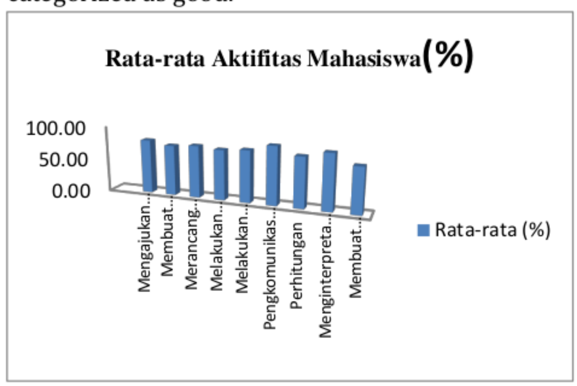

Figure 3. Student activities in learning

Referring to Figure 3, it can be seen that 33.3% have very good learning activities, and in the good category 66.66%. Based on this, it can be concluded that learning Ber2P3 can activate students in carrying out basic physics courses, especially material elasticity and Hooke's law.

2) Student Learning Outcomes:

The next indicator of effectiveness is student learning outcomes. The learning outcome test is carried out after students take part in the lecture process by applying Jire's collaborative learning model. The analysis of the completeness of student learning outcomes in limited trial classes and expanded trials will be described below.

Analysis of student learning outcomes is shown in Figure 4 below.

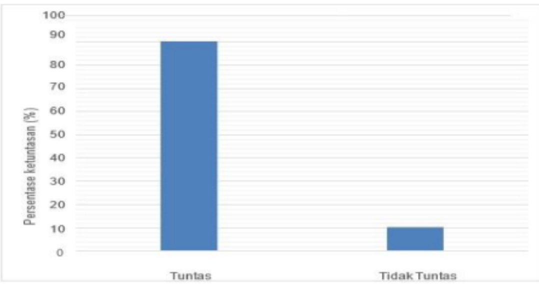

Figure 4. Percentage of Completion of Learning Outcomes in Limited Trial Classes

Based on Figure 4 above, it can be seen that classical completeness of student learning outcomes reaches a percentage of 90%, meaning that 18 students complete Basic Physics 1 material elasticity and Hooke's law after attending lectures using the Ber2P3 learning model, while the other 10% or 2 students do not complete. Referring to the previously mentioned effectiveness criteria, the effective Ber2P3 learning model is applied in Basic Physics 1 subject elasticity and Hooke law.

CONCLUSION:

Based on the analysis of the research data carried out, it is concluded that the development of learning tools with the Ber2P3 learning model is valid, practical and effective. The learning device was declared valid because the level of validity showed a mean of 4.2 and the student response was positive. Learning tools are declared effective, because the Ber2P3 learning model provides a good effect.

Based on the conclusions, suggestions can be made for further researchers, it is expected that the results of the research as input for lecturers to choose the right learning method in Basic Physics 1 lectures. One of them is to apply the 2P3 learning model that has been tested for its validity, practicality and effectiveness.

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GENERAL COMMENTS

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