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Development of PjBL Model-Oriented Teaching Materials on Students Learning Outcomes

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ABSTRACT

This development research aims to: 1) Describe the results of the validity, attractiveness and practicality of the development of PjBL-oriented teaching materials to improve the science learning outcomes of Grade 6 students 2) Knowing the effectiveness and efficiency of the implementation results of the development of PjBL-oriented teaching materials to improve the learning outcomes of grade 6 students to be implemented for students. This study used an R & D (Research and Development) design using the ADDIE development model. Data collection techniques for teaching materials expert questionnaires. The results of the validation of teaching material experts showed a score of 94.2%. The small group test score obtained was 84.4 and the results of the field trial were 87. The student response questionnaire obtained results of 95. 6% can be stated that the PjBL-based science teaching materials on the adaptation of living things in class VI elementary school are very valid to be applied in science learning and for large groups the average is 95.3 with very practical criteria. The teacher response questionnaire averaged 90 with very practical criteria. The results of pretests and postes experienced an increase in the average score of the post test of 89.8 so that it can be concluded that there is an increase in scores in student learning outcomes. Based on the results of the study, it was concluded that the teaching materials for the content of PjBL-oriented science developed using the ADDIE model have good quality from the aspects of content, visual design, and grammar to be used.

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1. INTRODUCTION

Education is a human process that makes it possible to realize an increase in human dignity and worth. Education can help students develop optimally, namely developing the potential and value systems needed to live in society. PEducation does not only build humans from the cognitive side, but also from a more fundamental side(Wijaya 2017). Science education is a learning activity directed at helping students gain a deeper understanding of the natural surroundings(Sardinah et al., 2012). Science learning will be very fun for students if it is supported by relevant learning models and media(Suprianti et al., 2021).

In the 2013 curriculum, learning is carried out based on activities with the characteristics of a scientific approach. The scientific approach has a sequence of learning processes, namely: (1) observing (2) asking (3) gathering information (4) reasoning (5) communicating. So thematic learning with science content in elementary schools is carried out by actively involving students to build their own concepts and understanding through scientific activities observing real objects. The characteristics of science learning in elementary schools are also inseparable from the use of various tools (media) to help students in learning, still in the same book.Djojosoediro (2012)argued that the characteristics of science learning involve all the senses, carried out in various ways (techniques), require various tools (media) to assist observation, and an active process carried out by students. This active process can build students' own understanding of concepts.

Based on the results of observations and initial observations of researchers at UPT SD Negeri Kaweron 02 Kec. Talun Kab. Blitar still uses teaching materials in the form of thematic student books and is the only source of student learning. The existing teaching materials are felt to be insufficient to facilitate students in digging up information in the learning process and also not enough to help students convey essential things that students should know, especially in science content. Learning refers to the 2013 curriculum which is explained in the science content guidelines that development can produce productive, creative, innovative people through learning activities.

Researchers see that there are several problems related to learning in the classroom, namely: 1) students only learn to use one source book, namely student books, the teacher acts as a source of verbal learning, 2) students are passive and only listen, 3) students find it difficult to mention the adaptation of living things. along with examples, 4) the teacher has difficulty providing the material if it does not empower Google as a source of information, 5) the lack of teaching materials developed by the teacher, so that it greatly affects the enthusiasm of students to learn more about the material, 6) student interest is low so and To learn the material, it is limited to listening to the teacher's explanation and then taking notes on the teacher's writing on the blackboard.

Students' cognitive learning outcomes show an average value of 70.93 in semester 1 and 72.62 in semester 1 for science content in the 2021/2022 school year with details of 68.18 for the average value of basic competence 3.3 regarding adaptation of creatures. live with the environment. The number of students who get learning outcomes below the KKM are 13 students from 20 students, which is 65.00% and those who get learning outcomes above the KKM are 7 students (35.00%) where science learning outcomes should be above the KKM 70%.

The results of interviews with grade 6 teachers at SD Negeri Kaweron 02 Kec. Talun Kab. Blitar obtained information about students' difficulties in understanding the concept of adaptation of living things, this initial information was then followed up by collecting data through observation and questionnaires, data collection was carried out by analyzing material, analyzing learning in schools, analyzing available learning facilities and infrastructure. IPA material analysis theme2 there are concepts in the form of facts that must be observed by students to build understanding but not all of these facts can be presented in concrete form, PjBL-oriented teaching materials using barcodes to make it easier for students to access videos in printed teaching materials are very suitable for use in learning to improve the quality of student learning both in process and outcome.

Observing some of the weaknesses and strengths in the initial observation activities above, it is necessary to make efforts to solve these problems. Some efforts that can be done are (1) Developing strategies, models or learning methods that can increase students' enthusiasm in participating in learning, reducing the level of abstraction of the material. (2) Develop or create teaching materials that are adapted to the character of students in class, develop interesting, effective and efficient teaching materials that can attract students' enthusiasm related to the adaptation of living things accompanied by concept maps, the developed teaching materials can stimulate the adaptation of living things so that it can reduce the level of abstraction of the adaptation material of living things themselves.

Difficulties in learning science content are also seen in students, there are several causes of student learning difficulties, namely: 1) the books that are owned and used by students are only 1 type of book from the government, they do not use other books, so they need to improve teaching materials for PjBL or PBL-oriented companion teaching. 2) in the implementation of the scientific approach (5M) students can at least be in the questioning section or are less able to carry out questioning activities. 3) students are afraid of being wrong in answering so they choose to be silent when asked the answer is hesitant. 4) students admit that they cannot imagine how living things adapt. 5) students are afraid of being bullied by their friends when they answer wrongly. 6) students' ability to read texts is lacking and looks uninspired 7) pictures of adaptations of living things in books are less attractive to students 8) students feel bored if they have to listen to

explanations from teachers continuously 9) students have difficulty analyzing how living things adapt to environment because the media used does not support only pictures in books. 10) students' creativity cannot develop. Difficulties also come from the teacher's side.

Constraints and difficulties in conveying material adaptation of living things to grade 6 students are also seen from the teacher's side, namely: 1) The teacher does not give awards to students who ask 2) when there are students who ask the teacher continues to ask questions so that many students are afraid to ask. 3) the questions I give to students are not understood by students 4) the teacher is too fast in delivering the material and only uses one learning resource, namely the student book 5) the method that the teacher uses is the lecture method and the teacher gives assignments to work on the questions after the teacher lectures and instructs students to copying notes on the blackboard 6) the teacher does not use any media, only uses pictures in the book.

From the explanation above, it can be concluded that the learning of science content needs to be improved in innovation. The use of teaching materials that are only sourced from one book and the teacher applies them not using relevant learning models has an impact on students' low interest and learning outcomes. For this reason, it is necessary to develop PjBL-oriented teaching materials which have several advantages over existing teaching materials and have been used by teachers especially to deliver learning materials about adaptation of living things.

PjBL learning model according to(Amini 2015)states that project-based learning contains complex tasks that provide opportunities for students to channel/design products, develop, and enhance their creativity (Fitria 2020)PjBL model affects learning activities, creativity and student learning outcomes. teachers and researchers are directly involved in the research process from the beginning to the results of the research in the form of reports. In line with the opinion(Wijoyo 2018) Project-Based Learning provides opportunities for students to explore content (material) using various ways that are meaningful to themselves, and to conduct experiments collaboratively. Thus, since the research appointments I have always been involved, then monitor, record, and collect data, then analyze the data and end by reporting the results of the panel..

Based on the explanations that have been presented, this study develops PjBL-oriented teaching materials with science content about the adaptation of living things used in face-to-face learning that can be used by students independently. Based on the background of the problems described above. Then the general problem is formulated, namely "how is the development and efficiency of PjBL-Oriented Teaching Materials to Improve Learning Outcomes of Class 6 Students on Adaptation of Living Things in Elementary Schools."

Based on the problems above, several research questions were identified as follows: 1) how are the results of the validity, attractiveness and practicality of developing PjBL-oriented teaching materials to improve the learning outcomes of Class 6 students on living things adaptation materials at UPT SD Negeri Kaweron 02 Kec. Talun Kab. Blitar? 2) What are the results of implementing the development of PjBL-oriented teaching materials to improve student learning outcomes for Class 6 material on adaptation of living things at UPT SD Negeri Kaweron 02 Kec. Talun Kab. Blitar is very effective and efficient to be implemented for students? The objectives of this development research are 1) to describe the validity results,

2. METHOD

This study uses an R & D (Research and Development) research design, namely the research method used to produce certain products, and test the effectiveness of these products. To produce a product, research is used to analyze needs and test the effectiveness of the product. Research and Development Procedures(Sugiyono 2017). The development model used in this study is the Branch theory, namely the ADDIE model. Development research was carried out at UPT SDN Kaweron 2 Blitar for 20 students in grade VI, which was carried out in May – September 2022.

3. Results

The results of the research and discussion obtained from data collection were carried out in accordance with research and development procedures. The research and development model carried out in this research is using the ADDIE research and development model. ADDIE research and development model with steps, namely Analysis (Analyze), Design (Design), Development (Development), Implementation (Implementation), and Evaluation (Evaluate)(Branches 2009). The teaching materials developed are thematic teaching materials for IPA Class VI subject matter Adaptation of living things in semester 1 of elementary school in accordance with the 2013 curriculum. This research was conducted to develop learning teaching materials in the form of teaching materials.

The results of the validation of the validation of teaching materials on September 15, 2022. This validation is carried out to determine the level of feasibility of the teaching materials that have been developed.PjBL-oriented science teaching materials on adaptation of living things class VI semester 1elementary school with assessment aspects in the form of display and design of teaching materials and components of teaching materials. This assessment of the validation of teaching materials experts uses data collection techniques with questionnaires using a questionnaire instrument of teaching materials experts. The results of research by teaching materials experts showed a score of 94.2%.

Table 1 Validation of Teaching Materials

Scoring Indicator	**Average**	**Criteria**
Size of teaching materials	100	Very Valid
Cover Design Teaching materials	91.6	Very Valid
Design content of teaching materials	91.2	Very Valid
Average	**94.2**	**Very Valid**

After product manufacturePjBL-oriented science teaching materials on adaptation of living things class VI semester 1elementary school is complete, then the next stage is to validate the first stage.The results of the validation research of teaching materials experts get a score with a rating scale of 1-4 and get a final presentation of 94.2% through this score it can be concluded that teaching materials are very valid but there are still things that need to be improved. Therefore, revisions were made by improvingPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary schoolaccording to the advice of the validator. After revision, the teaching materials were given to the validator, then the validator commented that:PjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary schoolcan be used in learning. Based on pencilFrom the results obtained, it is known that the teaching materials developed are very valid and good in terms of appearance so that they canPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary schoolentering the next stage, namely the implementation stage, where to see the value of the feasibility of teaching materials from the responses of class VI students at UPT SDN Kaweron 2 Blitar.

Validation results from material validation on September 25, 2022. This validation was carried out to determine the level of harmony of the teaching materials developed with related materials. This material expert validation assessment uses a material expert questionnaire data collection technique. The results of this research by material experts show a score of88.35%.

Table 2 Material Validation

Rating Indicator	**Average**	**Criteria**
Content Eligibility	100	Very Valid
Serving Eligibility	83.1	Valid
Language Assessment	82.2	Valid

Assessment of illustrated teaching materials	82.1	
Average	**88.35**	**Valid**

After validating the teaching materials, then validating the first stage of the material. The results of the material expert validation research get a score with a rating scale of 1-4 and the final presentation of 88.35% through this score it can be concluded that the teaching materials are quite valid but still need revision. Therefore, revisions were made by improvingPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary schoolaccording to the advice of the validator. After revision, the teaching materials were given to the validator, then the validator commented that:PjBL-oriented science teaching materials on adaptation of living things class VI semester 1elementary school alreadycan be used in learning.

Based on the assessment that has been obtained, it is known that the teaching materials developed have been very valid and both in terms of material and language.PjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary schoolentering the next stage, namely the implementation stage, where to see the value of the feasibility of teaching materials from the responses of class VI students at UPT SDN Kaweron 2 Blitar.

The small group trial was carried out by three grade VI students of SD Negeri Kaweron 2 Blitar, and one teacher at VI UPT SD Negeri Kaweron 2 Blitar. They were asked to fill out the questionnaire that had been provided. The questionnaire given is in the form of a closed questionnaire for teachers and students. This aims to facilitate researchers in revising the product. The following table is the result of the Small Group Test:

Table 3 Small Group Trial Results

No.	Name	Let's Test Knowledge about adaptation in plants	Let's Test Knowledge about adaptation in animals	Let's Test Knowledge about adaptation in humans
1.	Student 1	75	80	80
2.	Student 2	80	85	80
3.	Student 3	90	95	95
	Average Score	**81.8**	**86.6**	**85**
	Total value			**84.4**

In the test using science illustrated teaching materials by selecting 3 students who have homogeneous abilities, the value of 3 students has met the KKM and the average student score of 84.4 can be declared quite valid to be used in science learning.

Small group trials were conducted with 3 students and large group trials with 21 students. At the end of the trialPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary schoolstudents are given a student response questionnaire to the illustrated teaching materials.

Field trials are the final stage of formative evaluation. The purpose of this trial was to determine whether instructional use in the context for which it was intended (Branch 2009: 124). At this stage the trial was carried out by testing the product on 20 students excluding 3 students at the field trial stage (small group trial) in class VI UPT SD Negeri Kaweron 2 Blitar. The data obtained are summarized and used to make product revisions before the implement stage. The following table is the result of the Field Trial:

Table 4 Field Trials

No.	Student's name	Let's Test Knowledge about adaptation in plants	Let's Test Knowledge about adaptation in animals	Let's Test Knowledge about adaptation in humans
1.	Student 1	85	85	85
2.	Student 2	80	85	80
3.	Student 3	90	95	95
4.	Student 4	80	85	85
5.	Student 5	85	85	80
6.	Student 6	95	90	95
7.	Student 7	90	95	95
8.	student 8	80	85	80
9.	student 9	80	85	85
10	student 10	80	80	85
11.	Student 11	90	95	95
12	Student 12	80	85	85
13	student 13	85	85	90
14	Student 14	80	85	80
15	student 15	80	85	85
16	Student 16	85	85	90
17	Student 17	90	90	95
18	Student 18	85	90	90
19	Student 19	90	85	95
20	Student 20	95	95	90
	Average	**85**	**88**	**88**
	Total value			**87**

In the trial of the results of field trials using PjBL-oriented science teaching materials about the adaptation of living things in class VI semester 1 of elementary school by selecting 20 students who have homogeneous abilities, the value of 20 students has met the KKM and an average student score of 87 can be declared very valid or can be used without improvement in use in science learning.

Student response questionnaires were filled out by students in order to determine student responses to PjBL-oriented science teaching materials about adaptation of living things in the sixth semester of 1st semester of elementary school. This questionnaire contains an assessment of PjBL-oriented science teaching materials on the adaptation of living things in grade VI semester 1 of elementary school with a rating scale of 1-4. The results of the average student response to learning media produce. The results can be concluded that the PjBL-oriented science teaching materials about adaptation of living things in grade VI semester 1 of elementary school are very feasible or very practical. The results of the questionnaire from the responses of class VI students of UPT SDN Kaweron 2 Blitar obtained 95.6% results. It can be stated that PjBL-oriented science teaching materials about adaptation of living things in class VI semester 1 of elementary school are very valid to be applied in science learning.

Table 5 Small Group Student Response Questionnaire

Rating Indicator	**Average**	**Information**	**Criteria**
Display Aspect	95	read	Very Practical
Aspects of Material Presentation	95	read	Very Practical
Benefit Aspect	94	read	Very Practical
Average	**95**		**Very Practical**

Student response questionnaires were filled out by students in order to find out the student's response to PjBL-oriented science teaching materials about the adaptation of living things in the sixth semester of 1st semester of elementary school. This questionnaire contains an assessment of PjBL-oriented science teaching materials on the adaptation of living things in grade VI semester 1 of elementary school with a rating scale of 1-4. The results of the average student response to learning media produce. The results can be concluded that the PjBL-oriented science teaching materials about adaptation of living things in grade VI semester 1 of elementary school are very feasible or very practical. The results of the questionnaire from the responses of class IVI students at SDN Kaweron 2 Blitar obtained 95.3% results, it can be stated that PjBL-oriented science teaching materials about adaptation of living things in class VI semester 1 of elementary school are very valid to be applied in science learning.

Large Group Student Response Questionnaire

Rating Indicator	**Average**	**Information**	**Criteria**
Display Aspect	94	read	Very Practical
Aspects of Material Presentation	96	read	Very Practical
Benefit Aspect	95	read	Very Practical
Average	**95.3**		**Very Practical**

The teacher's response questionnaire was filled in by the classroom teacher regarding interactions, student involvement in using media, interest in illustrated teaching materials in science learning. The questionnaire used uses a scale of 1-4. The results of the teacher response questionnaire that has been filled out by the sixth grade teacher produce grades. The results can be concluded that the media used is very feasible or very practical to use.The results of the questionnaire from the responses of the sixth grade teacher of UPT SDN Kaweron 2 Blitar obtained 90% results that it can be stated that PjBL-oriented science teaching materials about adaptation of living things in grade VI semester 1 of elementary school very practical to be applied in science learning.

Teacher Response Questionnaire

Rating Indicator	**Average**	**Criteria**
Pictorial teaching materials activities	90	Very Practical
Average	**90**	**Very Practical**

The results of the pretest and posttest based on data analysis, the score value increased from the average value in the posttest 66.4 and the posttest average value of 89.8 so it can be concluded that there was an increase in the score usingPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary school with the value of learning outcomes, it can be said withPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary school very valid and practical to improve student learning outcomes. The following table shows the average results of the pretest and posttest:

Table 6 Average Results of Pretest and Posttest

Average Results of Pretest and Posttest	
Pretest	**66.4**
Postes	**89.8**

This large group trial was conducted at UPT SDN Kaweron 2 Blitar for 7 days starting on September 15, 2022 until September 22, 2022. The large group test used all 6th grade students of UPT SDN Kaweron 2 Blitar with a total of 20 students who were not included in the test. try small groups. From the trial use of this group obtained data in the form of quantitative data through the distribution of student response questionnaires and quantitative data from interviews with sixth grade teachers. From the results of the research obtained, it is known that all students are very enthusiastic about usingPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary school.

After the large group trial, the researcher gave a student response questionnaire to the science teaching materials filled out by the students. Based on the results of the summary of the student

response questionnaire above, it can be seen that the total score of 95.3 for the large group student response questionnaire. Shows that student responses are very practical. So with this percentage it can be concluded as a practical reference for science teaching materials that are very practical to use in the learning process.

The results of the pretest and posttest based on data analysis, the score has increased from the average value in the pretest and the average posttest value, so it can be concluded that there is an increase in value by using PjBL-oriented teaching materials for science content for class VI UPT SDN Kaweron 2 Blitar with learning outcomes. it can be said that PjBL-oriented teaching materials for science class VI UPT SDN Kaweron 2 Blitar are very valid and practical to improve students' mastery of concepts. Data analysis used paired sample t test. The data of students' pretest and posttest results were analyzed using IBM SPSS Statistics 22 software. The pretest value obtained from the average learning outcome or mean before using the development of illustrated teaching materials was 66.75. Posttest scores obtained from the average learning outcomes after using science teaching materials. The number of respondents or students of class VI who used the research sample was 20 students. std value. Deviation (standard deviation) at the pretest is 7,122 and at the posttest is 4,560.

Based on the analysis of the description results, it can be concluded that if the pretest score is 66.75 < 89.50 from the post test value, descriptively there is a difference between the average learning outcomes in the pre test and post test.

The hypothesis in the research and development of PjBL-oriented science teaching materials is Ho = the average posttest is less than or equal to the average pretest. As for Ha = the average posttest more than the average pretest. Based on the decision-making guidelines in the paired sample t-test, the significance value of the SPSS output results is if the value of Sig. (2-tailed) < 0.05 then Ho is rejected and Ha is accepted teaching materials have a significant effect on improving learning outcomes. On the other hand, if the value of Sig. (2 tailed) > 0.05 then Ho is accepted, Ha is rejected, teaching materials do not have a significant effect on learning outcomes. In addition, if using t table, if the value of t count > t table, then Ho is rejected and Ha is accepted. On the other hand, if the value of t count < t table, then Ho is accepted and Ha is rejected.

Based on table 4.17 above, it is known that the value of sig. (2 tailed) of 0.000 <0.05 and the t-count value of 38783 is greater than the t-table of 2.064, then Ho is rejected and Ha is accepted. The difference between the average pretest and posttest learning outcomes is 23,33333 with a difference between 25,422100 and 21,85566. So it can be concluded that teaching materials have a significant effect on improving learning outcomes. So it can be said that science illustrated teaching materials are very effective in improving student learning outcomes.

3.2.Discussion

DevelopmentPjBL-oriented science teaching materials on adaptation of living things class VI Semester 1Primary school To Improve Student Learning Outcomes

In research on the development of teaching materialsPjBL-oriented science on adaptation of living things class VI semester 1primary school researchers use the ADDIE pengembangan development model. Dick, Carey, and Carey (2009: 230) add that instructional material contains the content either written, mediated, or facilitated by an instructor that a student as use to achieve the objective also includes information thet the learners will use to guide the progress. Based on the expressions of Dick, Carey, and Carey, it can be seen that teaching materials contain content that students need to learn either in print or facilitated by the teacher to achieve certain goals. To produce certain products, research is used that is needs analysis and tests the effectiveness of the product(Sugiyono 2017).

The model for developing teaching materials used in this study uses the Branch theory ADDIE research model. This model can be implemented for development such as textbooks, learning teaching materials, learning videos, multimedia and so on(Wijoyo 2018). The ADDIE development model used is the ADDIE development model according to Robert Maribe Branch (2009: 2). There are various types of development models. MThis model consists of 5 stages, namely: Analysis, Design, Development, Implementation and Evaluation (Branches 2009).

This research was conducted by conducting initial observations and direct observations to schools by conducting interviews with the sixth grade teacher of UPT SDN Kaweron 2 Blitar. It was conducted on September 15, 2022 and it was found that UPT SDN Kaweron 2 Blitar used the K13 curriculum but in independent science learning and teachers were less innovative in developing teaching materials so students only studied science referring to the LKS book, and there was no innovation in learning activities. Students are less motivated in learning science because the teaching materials used are not interesting and students' grades are not good in learning science.

Through interviews with the sixth grade teacher of UPT SDN Kaweron 2 Blitar, the researcher found out that the development of science teaching materials for class VI of UPT SDN Kaweron 2 Blitar in the form of science teaching materials had never been implemented in class VI of UPT SDN Kaweron 2 Blitar. After getting data from interviews and an overview of the learning process of UPT SDN Kaweron 2 Blitar, the researchers continued research to design science teaching materials.

According to(Susilo, 2016)the notion of learning teaching materials can be interpreted as a teaching and learning study program. According to him, learning teaching materials are defined as the smallest program unit that can be studied independently, individually or directly by the students themselves. Broadly speaking, the notion of teaching materials can be interpreted as learning teaching materials that are packaged in teaching materials. Of course, the printed textbooks are arranged in a systematic, interesting and easy way to learn independently. According to (Sista 2017) interpreting teaching materials in outline is not too different where learning teaching materials are as learning packages that have the concept of learning materials.

Analysis of the Validity of Science Teaching Materials for Class VI Elementary School

Validity is a condition that describes the level of the instrument concerned that is able to measure what is to be measured(Arikunto 2006). The validity of teaching materials is done by validating the product development of science teaching materials, so the researcher makes a validation instrument for teaching materials experts and material experts with a questionnaire. Data analysis on the validity of science teaching materials with PjBL orientation on adaptation of living things for class VI semester 1primary school. Results The validity of PjBL-oriented science teaching materials on the adaptation of living things in the sixth semester of 1st semester of elementary school was declared very valid. Therefore, the conclusion is the validity of the development of PjBL-oriented science teaching materials on the adaptation of living things in the sixth semester of 1st semester of elementary school. shows very valid.**Practical Data AnalysisPjBL-oriented science teaching materials on adaptation of living things class VI semester 1primary school**

Practicality according to(Fitria et al., 2021)"Practically refers to the extent that users (or other experts) consider the intervention as appealing and usable in normal conditions." That is, practicality refers to the degree that users consider the intervention usable and preferable under normal conditions. In work related to the development of learning materials, it can be pointed out that measuring the level of practicality is seen from whether the teacher (and other experts) consider that the material is easy and can be used by teachers and students. to expand the response or response so that the data obtained is accurate. The students who were involved in filling out the questionnaire in the small test group trial were 3 students, the field trial was 20 students.

Based on the results of the practicality of science illustrated teaching materials, it is stated that they are very practical. Therefore, the conclusion of the practicality of developing science teaching materials shows that it is very practical. Suggestions given by teaching materials experts are: Fix the science teaching materials according to the notes in the script, check all sentences/words/numbers that are not logical.

Trial Analysis of Mastery of Learning Outcomes Concepts Development of PjBL-oriented science teaching materials on adaptation of living things class VI semester 1 Elementary School

Development is a process of translating design specifications into real/physical forms related to systematic learning designs, development and evaluation are carried out with the aim of establishing a scientific/empirical basis for creating new learning and non-learning products (Bujuri et al., 2018) Development research has two basic objectives of development research, namely: 1) development of product models/prototypes and 2) preparation of methodological suggestions for designing and evaluating product models or prototypes. The development of teaching materials is defined as a systematic analysis of the design, development and evaluation, learning processes and products that must meet the criteria of effectiveness, validity, and practicality.(Purnomo et al., 2016).

The development of science teaching materials on the adaptation of living things developed by researchers is also to measure students' mastery of concepts in science learning that has been studied with the PjBL model. A concept is a unit of meaning that represents a number of objects that have the same characteristics in(Sardinah et al., 2012)defines the concept of science as a category used to group events, ideas, or objects that are similar or are abstractions, creations of the mind to organize experiences. According to(Vendiktama et al. 2018)argues that mastery of concepts is the ability of students who are not only able to understand, but also can apply the concepts given in solving a problem. Based on these opinions, it can be concluded that mastery of concepts is the ability of students to understand the meaning of learning and apply it in everyday life. According to Winkel (1991) mastery of concepts can be obtained through: objects, pictures and verbal explanations and requires the ability to find the same characteristics on a number of objects. Mastery of concepts is obtained from the learning process.Mastery of the concept of teaching materials is done by scoring the results of student worksheets in the product development of illustrated teaching materials, the researchers made an assessment table for posttest and pretest to compare students' mastery of concepts against science illustrated teaching materials. Data analysis of students' concept mastery with PjBL-oriented science teaching materials about adaptation of living things in class VI semester 1primary school.

4. CONCLUSION

Based on the results of the study, it can be concluded as follows: 1) PjBL-oriented science teaching materials developed using the ADDIE model based on the feasibility test of material content about adaptation of living things have good quality in terms of content, visual design, navigation and grammar to be used. . 2) based on the response from the teacher as the user of PjBL-oriented teaching materials on the adaptation of living things material can be used for students as a complement to student learning resources that can attract students' interest in learning and improve student learning outcomes. In its use, it is easy for students to understand, the language is polite and does not contain elements of SARA.

5. THANK-YOU NOTE

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