Preliminary study development of student books research based learning to improve student competency in middle school science learning

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Abstract. Student books was used at schools have not undergone development and are still using old learning methods, so there was no development of learning methods. Every time the method of learning and teaching changes which aims to improve student learning competencies so that there are changes in the way of learning which of course also affects the learning outcomes obtained by students. In order to increas for student learning competencies, it is necessary to develop student books which will be integrated with research based learning methods in junior high school science learning. To develop the student book researchers need to carry out preliminary studies. This research method uses descriptive methods. The research subject was the Student's Book in Middle School Science. The research respondents were students of MTsN 4 Padang Pariaman, MTsS Balah Aie, dan SMP N 1 Patamuan, Padang Pariaman. Research instruments were observation sheets, questionnaires and interview guides that would later be given to science teachers and students. The data analysis technique carried out in this study is qualitative descriptive. The research results obtained will later show an analysis of the learning process included in the low, medium and high categories.

1. Introduction
School has a very important role in everyday life, because every thing that is done by an individual can be used as a tool to develop the potential that exists in him, so that the potential possessed by an individual can be developed to become even wider. In UU No.20 of 2002 stated "Education is a conscious and planned effort to realize the learning atmosphere and learning process so that students actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble character, and the necessary skills himself, society, nation, and country." Education is an active effort to prepare themselves for future developments that are more advanced. Therefore, the existence of education is expected to be a medium that can help educators like students in schools to prepare themselves for their aspirations in the future. According to Ki Hajar Dewantara revealed in Hasbullah (2013: 4) states that "Education is a guide in the life of the growth of children, as for its purpose, education is to guide all natural forces that exist in these children. So that they as humans and as members of society can achieve the highest safety and happiness.

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In education, of course as an educator not only gives encouragement to students to achieve goals, but an educator also needs to form and train the skills of students so that there is provision for him that he can use as a medium to achieve his goals in the future. These skills are also accompanied by knowledge, skills and how students can interact with the social environment. According to John Dewey in Hasbullah (2013: 3) states that "Education is the process of forming the fundamental abilities intellectually and emotionally toward nature and fellow human beings".

In every age development, of course education also has several developments and changes in its time, the way the educator presents the subject matter to students. There are various ways that can be done to foster students' learning competencies, one of them is by applying a particular model or by developing several learning traps that are felt to have an influence on the development of school learning such as student books.

Books are a tool that is often used to present a subject matter that will be taught or learned by students at school. At present there are various forms of books that are presented to students, one of which is to open students who are intended for students to learn and become a guide for students when studying.

Textbooks do not only contain course material, but are also accompanied by concepts that are felt to be needed in the book. Student books can be used by students as a means of supporting the smooth learning activities in class and at home. Therefore, in developing students' books the concepts and ideas must be in the form of a basic concept.

Development is an attempt to improve technical, theoretical, conceptual, and moral capabilities according to need through education and training. Development is a process of designing learning logically, and systematically in order to determine everything that will be carried out in the process of learning activities by paying attention to the potential and competence of students.

Development aims to increase a capability both in terms of technical, toeritis, moral or in the form of a product as researchers want to do. While research and development is an activity carried out to examine an event in the field and carry out the development of an existing product by adding one or more aspects that are needed in the fact that the field is not consumed in the previous product.

In a book that wants to be developed, of course there must be a method of learning that is applied, so that it aims at the goals and targets of developing books and achieving students in learning. Learning is a conscious effort that aims to carry out the development of a science. Learning also aims to shape the mindset and character of an individual to become better and more skilled in a field of learning that is learned. In carrying out a teaching and learning activity, then we need a comparison to see the results of learning that has been carried out, be it a test or an exercise that has been trained before.

According to Sardiman (2014: 20) states that "Learning is a change in behavior or appearance, with a series of activities such as reading, observing, listening, imitating, and so forth. While "Slameto (2013: 2) states that psychologically learning is a process of change that is the change in behavior as a result of interaction with the environment in meeting their needs. These changes will be evident in all aspects of behavior."

There are various kinds of learning approaches that can be applied during the teaching and learning process, one of which uses a research-based learning approach. According to Wardoyo (2013: 3) states that, "Research based learning approach is learning that requires students to be able to find, explore (develop knowledge) to solve problems faced, and test the truth of the knowledge. From the above meaning means by applying a research-based learning approach, the same means that educators teach students to engage with the phenomena that exist in the surrounding environment in accordance with the subject matter they are learning. Same is the case with the science lesson material that was studied by middle / middle school students. As we know that science studies natural phenomena that occur around students, thus as educators can invite students to be directly involved with natural events and symptoms that often occur in everyday life.

In the development of this science, there are various ways that educators can do to invite students to be directly involved with the environment, one of them is by developing student books that refer to
research based learning. As explained earlier research based learning is learning that aims to invite students to engage directly with the environment, with the research-based student book, it is expected that students can study carefully with the teachers and friends, or students can learn the lesson individual.

2. Research Methods
This type of this research is a qualitative descriptive study conducted at MTsN 4 Padang Pariaman, MTsS Balah Aie, and SMP N 1 Patamuan. The descriptive research is done to describe, and interpret or explain as in variables or countries. The instrument used to collect data was the questionnaire analysis media which was filled by educators at MTsN 4 Padang Pariaman, MTsS Balah Aie Padang Pariaman, dan SMP N 1 who taught integrated science subjects. The steps in analyzing questionnaire data that give a score for each item, and then summing the total score for all indicators, after adding up the scores for each aspect is then made an average. Determination of the title of competency level is as follows

| Score | Answer category       | Percentage of Indicator Achievement |
|-------|-----------------------|-------------------------------------|
| 1.    | Strongly Disagree (STS) | 0 – 25                              |
| 2.    | Disagree (TS)         | 26 – 50                             |
| 3.    | Agree (S)             | 15 – 75                             |
| 4.    | Strongly Agree (SS)   | 76 - 100                            |

Source: Sugiyono (2016: 135)

Data collection is an important work in a study. The right conclusion can only be obtained from the correct data collection. Therefore, errors in collecting data will lead to incorrect conclusions.

3. Results and Discussion
The results of this study are the percentage of learning media data analysis used at MTsN 4 Padang Pariaman, Balah Aie MTsS Padang Pariaman, and SMP N 1 Patamuan. Media analysis consists of three components: SKL analysis, standard analysis of the learning process, and assessment analysis conducted by science teachers at the school

3.1 SKL Analysis
SKL Analysis (Graduate Competency Standards) which includes spiritual attitude, knowledge, skills that are used as a reference for researchers to conduct research, based on the data that researchers have obtained can be seen in the following graph:

![Figure 1. Analysis SKL](image-url)
Figure 1 shows that in the SKL Analysis the Spiritual section shows a score of 72.72% and in the high category, then the knowledge shows a percentage score of 62.5 and in the high category, and the skill shows a percentage score of 70 and in the high category. Overall the acquisition of questionnaire analysis in the SKL analysis was obtained with a high category score, but the more dominant one was based on the data described, namely the spiritual SKL analysis with a percentage score of 72.72. Based on these data, educators certainly need to improve students' knowledge especially in science learning.

3.2 Standard analysis of the learning process
The standard analysis of the learning process which includes learning, planning and implementation of the learning process is used to see how far the planning and implementation of learning has been carried out in the school where the researcher conducts the research, so that it can be used as a comparison or improvement in the next learning plan during the implementation of science learning. The analysis results that researchers have done based on the learning process standards are as follows:

![Figure 2. Standard Analysis of the Learning Process](image)

Based on figure 2, the results obtained from the planning of learning with a percentage score of 83.33 with perfect categories, preliminary activities with a percentage score of 87.5 with perfect categories, core activities with a percentage score of 72.96 with a high category, and the last closing activity with percentage score of 81.25 with a high category. From the overall standard analysis data the learning process shows a perfect and high percentage. However, among these percentage scores core activities have a low value among other values. This means that there needs to be an increase in the number of activities, because this activity is an ongoing teaching and learning activity that aims to present learning material to students so that what is conveyed by educators can be absorbed perfectly by students.

3.3 Analysis of Assessments
Assessment analysis aims to assess attitudes, knowledge, skills, learning difficulties, models and learning approaches. So that later educators can balance the assessment of learning throughout the
teaching and learning process takes place. By the questionnaire analysis on the number of assessments, the percentage score is obtained as follows:

![Figure 3. Valuation analysis](image)

Figure 3 shows that attitude assessment with a percentage score of 78.125 with high categories, assessment of knowledge with a percentage score of 84.375 with perfect categories, assessment of skills with a percentage score of 88.75 with perfect categories, analysis of learning difficulties with a percentage score of 71.093 with high categories, and models and learning approach with a percentage score of 68.75 with a high category. From the overall data obtained, the assessment of skills is the highest among the other assessments, while the learning model and approach are the lowest among the other assessments. This means that a model and approach that is good and appropriate for students in learning schools needs to be developed in schools that can have a balanced assessment analysis.

4. Conclusion

The conclusion by data analysis that the researcher has done from the questionnaire that has been divided based on the category of SKL analysis, standard analysis of the learning process, and assessment analysis that is needed for educators to increase students' knowledge through core activities which are the delivery of learning material to students and the need for the development of models and the use of a good approach so there is a balance of student learning outcomes both from attitudes, knowledge and students skill.

By the results of the data obtained through questionnaires it was found that knowledge is the lowest value among the overall percentage score of 62.5. With the data obtained, it is hoped that it can help the researcher to develop student books with a research-based learning approach so that there is an increase in students' knowledge on science subjects.

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