

The Practicality Of Teachers Book Oriented Research-Based Learning On Science Lesson In Junior High School

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Abstract— This research was conducted at SMPN Padang. The focus of this research is the development of a Research-based Teacher's Book on Science Learning for SMP/MTs. This research is motivated by the infrequent use of teachers' books in schools due to various considerations because it is considered that there are still shortcomings in the teacher's books. The type of research that will be conducted is research and development. This development process refers to the development of the Four-D model (4-D model). The 4-D model development model consists of 4 stages, namely: the definition stage, the design stage, the development stage and the deployment stage. The research subjects in this study were junior high school science teachers. To see the readiness of the product in the learning process, data collection was carried out using practical instruments. Based on the results of the practicality instruments carried out, it was found that the practicality of the Teacher's Book based on the teacher's response was in the very practical criteria with an average value of 95.05% thus, the teacher's book was practically used based on the teacher's opinion.

Keywords—*teacher's book, research-based learning, science, practicality.*

I. INTRODUCTION

The curriculum used today is the 2013 curriculum where this curriculum requires students to be active in learning. The 2013 curriculum uses a student-centred learning approach (Student Centered Learning). Educators as facilitators must be able to create effective, efficient, and quality learning with students as learning subjects. That way the objectives of learning can be achieved and the competence of students can be increased.

The implementation of the scientific approach in the 2013 curriculum requires preparation of various components, one of which is the readiness of educators as implementers in the field. The right concept to be applied in learning based on the 2013 curriculum is the learning process in which there is a process of investigating new facts and concepts in a subject matter. Research-based approach is learning that requires students to be able to find, explore (develop knowledge) to solve the problems at hand, and test the truth of that knowledge [1]. In this approach, educators have the authority to prepare planning, implementation, assessment and supervision in learning. The interaction in this approach is an active interaction, where the educator has a role as a facilitator and media that helps students to achieve the expected competencies.

The 2013 curriculum uses a scientific approach. The implementation of the 2013 curriculum expects the creativity of teachers in developing learning tools. In order to achieve a directed learning process, it is necessary to have guidelines that can demand

both students and educators. Since the 2013 curriculum, textbooks used by educators and students have been provided by the government, each of which has one textbook, namely student books and teacher books.

Humans have a mind that can be developed at any time which is called the learning process. The learning process produces something called learning. Learning is a change in behavior that occurs in a person caused by learning [1]. Everything that is done in the learning process is expected to produce a meaning/value that can be taken. The benefits that can be felt by students themselves are increasing knowledge and knowledge of something.

After conducting interviews with teachers at SMPN Padang, not all teachers used textbooks that had been provided by the school or the government. One of the textbooks in question is a student book and a teacher's book. Textbooks in the form of student books are most often used because they can guide students in the learning process, although sometimes not all the learning steps contained in the student books can be applied optimally by the teacher, this is usually caused by insufficient time in the learning process or not the availability of practical tools if the material involves practical activities. In addition, the results of the interviews also showed that only a few teachers used the teacher's book as a guide in the learning process. Teachers are still not able to use the teacher's book to its full potential. One of the obstacles faced is the inadequate quantity of teacher books provided by the school, which is usually taught by several teachers at each grade level, while only one teacher's book is provided. Another thing that was obtained from the interview was that the teacher still did not understand the steps in the teacher's book, because it was considered difficult to implement in schools. In addition, for some materials related to practicum activities, not all of them can be done, because each school has a different quality of laboratory space.

The teaching materials to be developed must pay attention to the characteristics of the materials and supporting facilities in the school, and most importantly it must refer to the 2013 curriculum. The 2013 curriculum prioritizes observing, asking, trying, processing, reasoning, and creating activities. This activity provides an idea to make research-based teaching materials that can optimize the science learning process.

In research-based learning, students are trained to solve problems by looking at the facts they encounter [2]. Through this process the problems to be solved can make students motivated and play an active, creative and innovative role. Research-based learning is multifaceted which refers to various learning methods. Research-based learning provides opportunities/opportunities for students to seek information, formulate hypotheses, collect data, analyze data, and make conclusions on the data that has been compiled [3]. Through this learning, students are expected to be able to conclude their own theories and concepts from a learning activity. Research-based learning can not only be done through practicum activities but also by providing media that is able to direct students to optimize their activities in learning so that they are able to find and conclude learning outcomes based on the data and information obtained. Therefore, it is important to implement a process research-based learning that will be included in science learning.

There are 3 (three) research steps, namely Exposure, Experience, and Capstone. The three stages of the RBL model can be developed into 6 steps, namely Exposure Stage (Introduction Stage), Lecturing of core knowledge (Reference buying stage), Experience Stage (Action Stage), presentation (Presentation Stage), Final Report [4]. Research-based learning is based on the philosophy of constructivism which includes 4 (four) aspects including learning that builds student understanding, learning by developing prior knowledge, learning which is a process of social interaction and meaningful learning achieved through real experience [5]. Research-based learning (PBR) is also a learning method that uses authentic learning (there must be real examples), problem solving (answering cases and contextual), cooperative learning (together), contextual (hands on & mind on), and inquiry discovery approach (find something) which is based on the philosophy of constructivism (ie self-development of students who are continuous and sustainable).

Research-based learning aims to (a) increasing the meaning of the subject to be more contextual in nature through the presentation of research results, (b) strengthening students' thinking skills as researchers, (c) completing lessons through internalizing research values, practice and research ethics by involving students in activities research, (d) improve the quality of research at the education unit level because it can involve students in research activities, (e) increase students' understanding of the development of knowledge through continuous research, (f) increase understanding of the role of research in innovation so as to encourage students to think creatively in the future, (g) improve the quality of learning in general [5].

Research or research is an activity or effort carried out to find, develop, and test the truth of a knowledge and conclude the findings obtained [1]. Research-based learning is a teaching method that emphasizes research in the learning process. This activity

produces a situation where students are directed to use relevant research achievements from education as part of teaching materials [6]. Based on the statement above, it can be concluded that research is an activity and effort to acquire and develop knowledge with a method to test its truth and conclude its findings.

The teacher's book is a guide for educators in carrying out the learning process. Quality teacher books that can adapt to learning needs need to be provided. Both by the government and the teachers themselves. According to Ministerial Regulation Number 32 of 2013 concerning Amendments to Government Regulation Number 19 of 2005 concerning National Education Standards, Teacher Guidebooks are guidelines that contain learning strategies, learning techniques, and assessments for each subject and/or learning theme.

The teacher's book is a guide for teachers in carrying out learning which includes preparation, implementation, and assessment as well as guidelines for the use of student books [7]. The teacher's book consists of two parts, namely general instructions and special instructions. General instructions contain information about the scope and scope of science learning, assessment of science learning, learning models, basic competencies and material mapping. Furthermore, special instructions consist of several chapters according to the material in the student book.

teacher's book should be presented in the most attractive form possible and in an easy-to-understand language. Where it can help students to think logically based on facts and theories and can involve students directly to create active students. In addition, the steps in the teacher's book must also be easy to apply in the learning process in every school. Based on the explanation above, it is necessary to analyze the material in each school to adjust the material to the availability of learning support tools and the school environment.

The material that is considered suitable for the application of research-based learning that will be included in the teacher's book is junior high school science material. The 2013 curriculum states that science learning at the junior high school level is carried out on an integrated basis. In essence, science is built on the basis of scientific products, scientific processes, and scientific attitudes [4]. In general, science covers three basic fields of science, namely biology, physics, and chemistry. Science learning is oriented towards the ability of students to learn, curiosity, and the development of a caring and responsible attitude towards the environment. It is hoped that this ability can be honed by applying research-based learning in every material in the science study.

The packaging of experiences designed by educators in science material has an effect on the meaningfulness of students' learning experiences. With this learning well packaged, it is hoped that the learning process can achieve its goals as a whole and precisely. The development of these teaching materials is expected to be in accordance with the materials, needs, and conditions of the school, in order to create objective and effective learning. The activities of students in science learning will determine the attitude of students to learning, both experience and competencies obtained. Based on the background of the problem, teaching materials were developed in the form of a teacher's book with a research-based learning approach to science learning for one semester of material that will be adapted to valid, practical, and effective school conditions and conditions according to the demands of the 2013 Curriculum.

II. METHOD

The type of research that will be conducted is research and development. This development process refers to the development model of Thiagarajan, Semmel and Semmel [8]. known as the Four-D model (4-D model). The 4-D model development model consists of 4 stages, namely: the definition stage, the design stage, the development stage and the deployment stage. The research development procedure begins with planning the development of a research-based Teacher's Book on science learning in junior high schools. Products that have been developed previously will be tested for practicality. The practicality instrument was used to determine the teacher's response to the practicality of the developed teacher's book. The practicality test in this study used data collectors in the form of a questionnaire that had been compiled and then filled out by the teacher. A teacher's book has practical criteria if the components of the teacher's book are easy to understand, interesting, and efficient and have been included in the predetermined criteria. The final score of practicality results is obtained using the formula:

$$P = \frac{Q}{R} \times 100\%$$

Information:

P = practicality value

Q = score obtained

R = maximum score

After obtaining the percentage of the final practicality value, then categorizing the percentage of the final practicality value with the product practicality criteria can be seen in Table 1.

Table 1. Criteria and Product Practicality Interval [9]

Intervals (%)	Criteria
0-20	Tidak Praktis
21-40	Kurang Praktis
41-60	Cukup Praktis
61-80	Praktis
81-100	Sangat Praktis

Product practicality analysis was carried out by filling out the practicality test sheet by the teacher to determine the practicality of the product. The product practicality indicators used include products developed that are easy to understand, attractive and efficient products. Practical data analysis uses a Likert scale.

III. RESULT AND DISCUSSION

The teacher's book that has been valid can then be used for practical testing. The teacher's book practicality test was conducted on 6 teachers. The Teacher's Book was given to 6 teachers at SMP Negeri Padang. Then asked the teacher's response to the practical components of the Teacher's Book. The teacher's response was asked through the teacher's practicality questionnaire instrument. The practicality test of the teacher's book was carried out using a teacher response questionnaire. The teacher's book practicality questionnaire includes the following: (a) easy to understand in terms of mind maps, the material in the teacher's book, learning activities, assessment (b) interesting in terms of the color composition of the teacher's book, the material in the teacher's book adds to the reader's insight, and the completeness of the material in the teacher's book adds insight to the teacher, (c) efficient in terms of the relative time in understanding the teacher's book, in accordance with the standard lesson hours set by the government, in terms of the cost of the teacher's book can be compiled and developed with a relatively small cost, Teacher books can be used as a source of additional teaching materials for teachers, and teacher books can be used to facilitate teachers in the learning process. The results of the teacher's response to the practicality of the Teacher's Book are shown in Table 2.

Tabel 2. Teacher's Response to the Practicality of Teacher's Books

No	Statement	Score	Category
1	Easy to understand	96,43%	Very Practical
2	Interesting	93,06%	Very Practical
3	Efficient	79,17%	Practical
Rata-rata Praktikalitas		95,05%	Very Practical

Based on Table 2, the practicality of the Teacher's Book based on the teacher's response is in the very practical criteria with an average value of 95.05% thus, the teacher's book is practically used based on the teacher's opinion. Based on Figure 1, it can be seen that the practicality of the teacher's book from the easy to understand, interesting, and efficient aspects is in the very practical category, while the interesting aspect is in the very practical category. The value of each statement is in the range of 79.17% to 96.43%.

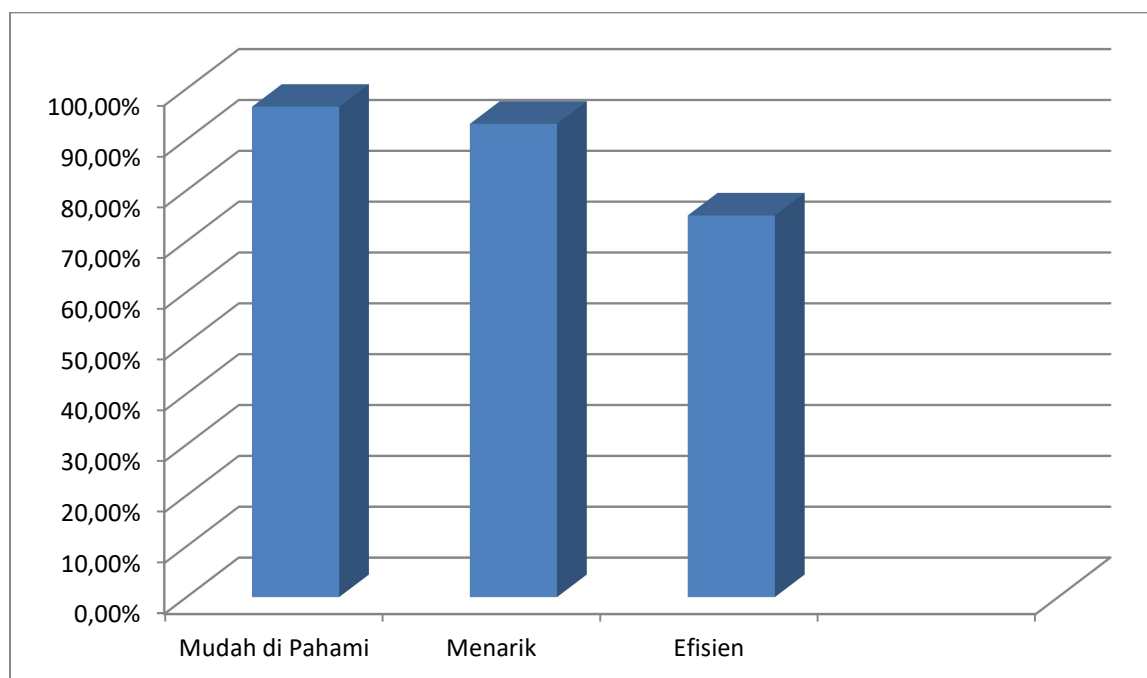


Figure 1. Teacher's Response to the Practicality of Teacher's Books

Figure 2 it can be seen that the efficiency aspect is still lower than the other aspects. The results of the teacher practicality test show that the teacher's book developed is very practical, which means that the teacher's book is easy, interesting, and efficient to use. This shows that the material in the teacher's book is considered interesting, adds insight and information for teachers and makes it easier for teachers to carry out learning.

The practicality test was assessed by the teacher using an instrument in the form of a practicality questionnaire. The teacher's book practicality questionnaire was assessed directly by the teacher using a practicality questionnaire. Practicality as the ease with which there are instruments, both in preparing, using, interpreting/obtaining results, as well as the ease of storing them [10]. Practicality is seeing the extent to which teachers/students consider the intervention of whether a product is attractive and can be used.

[11].

According to the teacher in the easy-to-understand aspect, it is necessary to have a concrete explanation in the material section along with the addition of real examples outside the student book according to the material to expand the teacher's knowledge in delivering material during the learning process. In addition, the teacher's book also has continuity with the existing student books for teachers to provide learning instructions. The completeness of the material contained in the teacher's book is interesting to learn and can add insight and knowledge for readers. Then it is also necessary to add character assessment to make it easier for teachers to conduct character assessments on students. The rest of the material provided by the teacher can be understood well, clearly and adds insight to the teacher.

On the interesting aspect, the teacher's book has been made as attractive as for the reader, but there are some colors that are considered necessary to emphasize the writings that are considered important and necessary. In terms of efficiency, teacher books are considered not to require too high a cost to be developed, considering that one teacher only has one teacher's book. Teacher

books are also considered to be used in the learning process as a teacher companion and additional teacher references in the learning process in the classroom.

This is in line with the results of a similar study [11] which obtained the connected type of integrated science teacher's book product with character content obtained by a teacher's book with very practical criteria. Another similar study [12] explained that the research-based learning model used can improve the ability to master science concepts in learning by integrating them and utilizing available learning resources in schools. In addition, research-based learning models can also improve learning activities and students' learning mastery.

IV. CONCLUSION

Based on the data obtained, it is known that the teacher's response to the practicality of the teacher's book on the easy-to-understand indicator is 96.43% in the very practical category, the teacher's response to the practicality of the teacher's book on the interesting indicator is 93.06% with the very practical category, and the teacher's response the practicality of the teacher's book on the efficient indicator is 79.17% in the practical category. Overall, the teacher's response to the practicality of the teacher's book is 95.05% with a very practical category. From these data, it can be concluded that it is easy, interesting, and efficient to use in the learning process and the material in the teacher's book is considered interesting, adds insight and information for teachers and makes it easier for teachers to carry out learning.

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