INVESTIGATING A PROJECT BASED LEARNING LEARNING MODULE AT SENIOR HIGH SCHOOL

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Abstract
The availability of teaching materials that are easy, appropriate, and interesting for students can influence students' understanding of learning. This study aims to look at the practicality of learning modules constructing scientific work based on Project Based Learning for class XI SMA Negeri 1 Sungai Geringging. This research is a research and development (R&D) development research with a 4-D (Four-D) model. The subjects of this study consisted of an Indonesian teacher and nine students of class XI IIS 2 SMA Negeri 1 Sungai Geringging who were randomly selected by the class teacher. Teachers and students as a sample were given an instrument in the form of a practicality test questionnaire. Data were analyzed with a Likert scale with a scale of 0-100 to show the ease, suitability and attractiveness of the module. To get a practicality value that indicates the ease of use of the module, the score obtained for each aspect is divided by the total value then the result is multiplied by 100. Likewise in determining the practicality value on the suitability and attractiveness of the module. The results of data analysis from questionnaires filled in by teachers and students show a very practical category. The practicality of teachers generally obtains an average percentage of 85.71% in the very practical category and students generally obtain an average percentage of 87.30% in the very practical category.
Keywords:teaching materials, modules, constructing scientific work, practicality

Abstrak
Tersedianya bahan ajar yang mudah, tepat, dan menarik bagi siswa dapat mempengaruhi pemahaman siswa terhadap pembelajaran. Penelitian ini bertujuan untuk melihat kepraktisan modul pembelajaran penyusunan karya ilmiah berbasis Project Based Learning pada siswa kelas XI SMA Negeri 1 Sungai Geringging. Penelitian ini merupakan penelitian pengembangan Research and Development (R&D) dengan model 4-D (Four-D). Subyek penelitian ini terdiri dari seorang guru bahasa Indonesia dan sembilan siswa kelas XI IIS 2 SMA Negeri 1 Sungai Geringging yang dipilih secara acak oleh guru kelas. Guru dan siswa sebagai sampel diberikan instrumen berupa angket uji kepraktisan. Data dianalisis dengan skala Likert dengan skala 0-100 untuk menunjukkan kemudahan, kesesuaian dan daya tarik modul. Untuk mendapatkan nilai kepraktisan yang menunjukkan kemudahan penggunaan modul, skor yang diperoleh untuk setiap aspek dibagi dengan nilai total kemudian hasilnya dikalikan 100. Demikian juga dalam menentukan nilai kepraktisan pada kesesuaian dan daya tarik modul. Hasil analisis data dari angket yang diisi oleh guru dan siswa menunjukkan kategori sangat praktis. Kepraktisan guru secara umum memperoleh persentase rata-rata sebesar 85,71% pada kategori sangat praktis dan siswa pada umumnya memperoleh persentase rata-rata sebesar 87,30% pada kategori sangat praktis.
Kata kunci*: bahan ajar, modul, penyusunan karya ilmiah, kepraktisan*

INTRODUCTION

Education is a component that helps advance the life of the nation. Sahroni (2017:115) states that education is an organized system and carries a fairly broad mission, namely everything related to the development of thoughts, feelings, will, physical, health, skills, social. Education has an influence on the progress of the nation. This is in line with the opinion of Sirate & Ramadhana (2017:316) the role of education in a nation is very important, because without human education it will be difficult to develop. In this case, the teacher has a role in improving the quality of education.

Teachers in the learning process, one of the parties responsible for improving the quality of education, are expected to have reliable expertise, skills and abilities in carrying out their duties as educators (Suprihatin & Manik (2019:66)). One form of the teacher's role in education is compiling teaching materials that help students learn independently. Teaching materials as a tool that helps teachers in conveying material play an important role. Teaching materials are used as supporting facilities in the learning process. The teacher's ability to process teaching materials affects students' understanding of the material being taught. Teachers who are able to manage teaching materials according to students' needs will motivate students to understand the material. One type of teaching material that students can use in learning is modules.

Modules are made to encourage students to be able to work independently in constructing practicum procedures to solve given problems (Raehanah (2021:34)). This means that students can operate the learning module themselves. In this case the teacher can only be a facilitator in the learning process. According to Yaumi (2018:113) a module is a small unit of learning that can operate independently. The use of modules can be carried out by students and with the help of teachers in solving problems. This is in line with the opinion of Hasanah dkk (2016:575) that modules can help students learn independently where the teacher becomes a facilitator in learning. Therefore, the module is commonly referred to as a self-learning package. The position of the module in the section on achieving learning objectives is quite important. Rusdiana (2014:181) explains that modules are structured to help students achieve a number of goals that are specifically and clearly formulated. Thus, through the learning module students can learn independently, without the help of educators. This was also confirmed by Hasanah dkk (2018) and Raehanah (2021:34) that learning modules are structured so that students are able to learn independently and as reference materials and evaluation tools for students. One of the appropriate materials for learning with modules is constructing scientific papers.

The material for constructing scientific work is material contained in Basic Competency 4.15 learning to construct a scientific work by paying attention to content, systematics, and language. Constructing is material that appears in the even semester of the senior high school (SMA) level. Learning on this material is intended to train skills in students. Students are asked to produce scientific work. Given the importance of this material, students should be able to produce scientific work that is in accordance with the right content, systematics and language. But in reality in the field students still have difficulty in writing scientific papers in accordance with these demands. Therefore it is necessary to develop modules that help students solve learning problems regarding constructing scientific work. Scientific work is the result of critical thinking on a problem. According to Sutrisna (2019:213) scientific work is the

result of carrying out scientific research and scientific research is a form of operationalism of scientific thinking.

Another opinion was expressed by Hasanah dkk (2016:576) scientific work presents a description, idea, argumentation or problem solving that is empirical and from theory to prove its truth. The contents of scientific works try to describe a scientific discussion carried out by a writer or researcher(Dalman, 2014:5). In a scientific work, it does not only describe the existing problems, but solutions and supporting theories related to these problems are explained in standard language.

The learning module developed uses project based learning stages to make it easier for students to understand the material in constructing scientific work. The suitability and attractiveness of the module will increase students' interest in reading the module. Research that was conducted by Susanti dkk (2020). In this research, modules designed with project based learning stages are very practical to use in learning. The difference with research conducted by researchers with previous research is in the material developed. Based on the problems that exist in schools, the material constructing scientific work is less attractive to students. Besides that, there is a lack of availability of teaching materials that focus on this material.

Based on the results of observations made at SMA Negeri 1 Sungai Geringging, it is known that there are problems encountered in understanding the material for constructing scientific work. First, students' interest in the material of constructing a scientific work is still lacking. Second, students experience difficulties in constructing a scientific work. Students understand the material of scientific work, but when asked to construct scientific work students experience difficulties, especially in determining coherent thoughts and choosing words for each paragraph. Third, the unavailability of modules that focus on one particular material. The teaching material used by the teacher to teach material for constructing scientific work for class XI students at SMA N 1 Sungai Geringging is an Indonesian language textbook. Fourth, the teaching materials used by teachers at SMA N 1 Sungai Geringging have not been able to help students produce scientific work.

Sani (2014:172) argues that Project Based Learning is learning with long-term activities that involve students in designing, making, and displaying products to solve problems in the surrounding environment. Project-based learning can enhance student learning. Students are able to understand the material more deeply after completing the project so that students are better able to apply their knowledge in solving problems in real life (Anazifa & Hadi, 2016). Learning through a project-based learning model is also able to encourage students' sense of responsibility, build self-confidence, solve problems, communicate ideas, and organize themselves to work more effectively.

Project Based Learning is learning that requires a long period of time, focusing on student activities to be able to understand a concept or principle by conducting in-depth investigations of a problem and finding relevant solutions and implementing them in project work, so that students experience a meaningful learning process by building own knowledge (Asri, 2016:153).

According to Sutirman (2013:1) there are advantages in learning based on Project Based Learning, namely students become active, improve students' ability to analyze a concept, familiarize students with working systematically, and increase student independence. Project Based Learning can enhance student learning. Students are able to understand the material more deeply after

completing the project so that students are better able to apply their knowledge in solving problems in real life (Anazifa & Hadi, 2016).

In this study, what will be explained is the practicality regarding the use of learning modules to construct high school scientific work. Practicality is known after the Indonesian language teacher Class XI and class XI students use the learning module.

RESEARCH METHODS

This research is a type of Research and Development (R&D) research using the 4-D (Four-D) model. Stage 4-D consists of four stages, namely defining, designing, developing, and deploying. The subjects of this development research trial were Feni Susanti, S,Pd, an Indonesian language teacher in class XI IIS 2 at SMA Negeri 1 Sungai Geringging and nine students from class XI II2 at SMA Negeri 1 Sungai Geringging. Students were selected according to the recommendations given by the Indonesian teacher for class XI II2 SMA Negeri 1 Sungai Geringging. The instrument used to collect data in this development research is a practicality questionnaire. There are three aspects of the extreme practicality used. First, the aspect of ease of use. In this aspect there are three that are assessed, namely clarity of presentation, clarity of language in modules, and project-based learning. Second, suitability with time. Third, attractiveness. In the aspect of attractiveness, there are two things that are assessed, namely the display design and the readability of the font. Data collection is done by.

The data collection technique was that after teachers and students used the developed modules, the researchers distributed practical questionnaires to teachers and students. Both parties will be asked to fill out a module practicality questionnaire that has been provided by the researcher. The data that has been obtained from the questionnaire distributed to teachers and students is then analyzed with a Likert scale with a scale of 0-100 using the following formula.

$$\text{Practical value} = \frac{\text{Score obtained}}{\text{Maximum score}} \times 100\%$$

(Riduwan, 2013:14)

Table 1. Module Practicality Category

No	Achievement Level (%)	Kategori
1.	81-100	Very Practical
2.	61-80	Practical
3.	41-60	Practical enough
4.	21-40	Less Practical
5.	0-20	Not Practical

(modified from (Riduwan, 2013:15)

RESULTS AND DISCUSSION

Many learning modules have been developed as student independent teaching materials. However, the material for constructing scientific work based on project-based learning in class XI SMA is the first time. Project based learning can help students produce products in the form of scientific work in accordance with the objectives of the module being developed. Elisabet dkk (2019:287) explained that learning with a project-based learning model can help students be more creative and train students' creative and creative ways of thinking so that learning objectives can be achieved. *Project based learning* directs students to learn independently with existing stages to solve existing problems. In addition, students are also required to produce a project or work (Priatna dkk.2017:72).

The step taken to produce valid teaching materials is to carry out a needs analysis of teaching materials in schools. The results of the four needs analyzes at SMA Negeri 1 Sungai Geringging. First, curriculum analysis was carried out by studying the 2013 revision of the 2018 curriculum because the school used the revised edition of the 2013 curriculum. Second, the analysis of student characteristics shows that in terms of the physical characteristics of students at SMA Negeri 1 Sungai Geringging, they are children aged 16-18 years. At this age students have been able to think to solve problems in a good way. The student learning style preferred by students at Sungai Geringging 1 Public High School is in the form of kinesthetic style. Third, the analysis of the material shows that in learning to construct scientific work at SMA Negeri 1 Sungai Geringging the main concepts of material for constructing scientific work consist of: 1) understanding of scientific work, 2) characteristics of scientific work, 3) types of scientific work, 4) structure papers, 5) language rules in papers. Fourth, the analysis of objectives shows that from the learning curriculum at SMA Negeri 1 Sungai Geringging on the material of constructing scientific work, students are required to be able to write scientific papers in the form of papers.

Based on the needs analysis that has been carried out, the researchers designed a learning module to construct scientific work based on project-based learning in class XI SMA. The design refers to the results of the needs analysis at SMA Negeri 1 Sungai Geringging. in terms of material, content and issues in the project based learning stage adapted to the circumstances and conditions of students at school.

The content in the module is designed with project-based learning stages. This is in accordance with the objectives to be achieved in learning using the developed module, namely students are able to produce products in stages. After the product is designed, the next stage is the product being validated by an expert validator.

The results of the validation of learning modules developed generally show an average score of 90.86%. As for the elaboration of the aspects assessed, namely the feasibility aspect of the content getting an average percentage of 89.00% with a very valid category, the presentation feasibility aspect is research on the systematics of titles, learning instructions, KI/KD, supporting information, layout on the consistency of systematic presentation in learning activities in the module get an average percentage of 92.00% with a very valid category. The project-based learning aspect is a study of the project-based learning stages contained in the learning module which obtains an average percentage of 96.00% with a very valid category. The linguistic aspect, namely the accuracy of the use of language and the ease of language in

the developed module, has an average percentage of 89.00% with a very valid category, and the graphical feasibility aspect is the accuracy of using fonts, writing, graphics. illustrations, and the design of learning modules that will be developed gets a percentage of 90.76% by category. The following is a table of expert validation results in general.

Table 2. Module Validation Results in General

No	Presentation Aspect	Earned Score	Validation Value (%)	Category
1.	Content eligibility	89	89,00	Very Valid
2.	Serving Eligibility	23	92,00	Very Valid
3.	*Project Based Learning*	48	96,00	Very Valid
4.	Language Eligibility	44,5	89,00	Very Valid
5.	Graphic Eligibility	59	90,76	Very Valid
Amount		**263,5**	**90,86**	**Very Valid**

After the module results were declared valid, the modules developed were tested in the field to find out the practicality of learning modules constructing scientific work based on project based learning for class XI students. Practicality trials were conducted on teachers and students of class XI IIS2 SMA Negeri 1 Sungai Geringging. The practicality test aims to determine the ease of use, aspects of compatibility with time, and aspects of the attractiveness of teachers and students to the modules being developed. The results of the practicality aspect of the learning module were obtained from a questionnaire given to Indonesian language teachers and nine students of class XI IIS2 SMA Negeri 1 Sungai Geringging. The following are the results of the practicality of teachers and students regarding the learning module constructing scientific works based on project-based learning for class XI students.

a. Practicality of Learning Modules for Teachers

The practicality of the learning module for teachers will be carried out on May 18, 2022. The practical results are obtained from the results of the teacher's response to the practicality of the learning module in constructing scientific work. Practicality results were obtained by using an instrument in the form of a questionnaire developed from a grid according to Lubis (2015: 24). The instruments that have been developed are given to the teacher and the teacher assesses the practicality of the learning module constructing scientific work based on the questionnaire instrument that has been given. The following are the results of the teacher's practicality of the learning module constructing scientific work based on project-based learning in class XI SMA.

Table 3. Teacher Practical Results

No	Presentation Aspect	Earned Score	Validation Value (%)	Category
1.	Aspects of Ease of Use	34	85,00	Very Practical
2.	Time Match Aspect	9	90,00	Very Practical
3.	Attractive Aspect	17	85,00	Very Practical
Amount		**60**	**85,71**	**Very Practical**

The results of the practicality of the module for teachers obtained an average score of 85.71% in the very practical category. A description of the practicality of the learning module in compiling scientific work for teachers is as follows. First, the aspect of ease of use obtains a score of 85.00 in the very practical category. This means that the developed learning module is in accordance with the presentation, content, and language that must be used so that students understand the material in the module. Second, the timeliness aspect obtained a score of 90.00. The total score indicates that the learning module is in the very practical category in terms of timeliness. In this aspect, learning using modules can help increase the efficiency of study time and students can use their respective abilities to produce products based on the material presented in the developed module. Third, the attractiveness aspect gets a score of 85.00. Based on this score, the attractiveness aspect scores in the very practical category. The combination of design, content and color in module development is attractive and pleasing to the eye. These results are in line with the research conducted Tascı (2015) that the advantage of learning with project-based learning is that students are directly involved with the project to be worked on. That way students have experience and material can be absorbed properly. Thus, students will be interested in reading and understanding the material constructing scientific work.

b. Practicality for Students

The practicality test of the module by students is carried out in several stages. First, the author distributes the module constructing scientific papers to students. Second, students use the module constructing scientific work that has been given. Third, students understand and learn the concept of constructing scientific work contained in the module. Fourth, students complete the competency test regarding the material for constructing scientific work contained in the constructing a scientific work module. Fifth, the authors distribute practicality test questionnaires. Sixth, students were asked to fill out a questionnaire which already contained statements about the module constructing scientific work. Seventh, students collect questionnaires that have been filled out.

Table 4. Student Practical Results

No	Presentation Aspect	Earned Score	Percentage	Category
1.	Aspects of ease of use	322	89,44	Very Practical

2.	Timing aspect	79	87,77	Very Practical
3.	Attractive aspect	149	82,77	Very Practical
Amount		**550**	**87,30**	**Very Practical**

Based on the results of data analysis, the practicality of the learning module constructing scientific work for students in general obtains an average percentage of 87.30%. This presentation is included in the very practical category. The practical description of the learning module constructs scientific work for students as follows. The aspect of ease of use obtains an average percentage of 89.44% in the very practical category. The aspect of conformity with time obtained an average percentage of 87.77 in the very practical category. The attractiveness aspect obtained an average percentage of 82.77 in the very practical category. This means practical learning modules according to students.

Involving students in learning can provide experience to students about the material being taught. The material will be understood by students because students play a direct role. So that learning material constructs scientific work not only material but also deep understanding in designing it. This is in accordance with the stages of project based learning.

These results provide an illustration that module development can attract students' attention in understanding a material (Rita, 2019). The research conducted (Selibauti & Karim, 2019) the use of the module, namely to measure students' abilities and train students to learn independently.

CONCLUSION

Based on research on the development of learning modules constructing scientific work based on project-based learning, the results are in a very practical category. The practicality trial contains three aspects of assessment, namely aspects of ease of use, aspects of suitability for time, and aspects of attractiveness. The assessment of the practicality of the learning module trials carried out by the teacher obtained a result of 85.71 in the very practical category. The practicality of class XI students at SMA Negeri 1 Sungai Geringging obtained a result of 87.30 in the very practical category. This proves that the learning module constructs scientific work that is developed practically and can be used in class XI learning at the senior high school level.

Based on the results of data analysis, the practicality of the learning module in constructing scientific papers for students in general obtains an average percentage of 87.30%. The presentation belongs to the very practical category. The description of the practicality of the learning module in constructing scientific work for students is as follows. The ease of use aspect obtained an average percentage of 89.44% in the very practical category. The aspect of conformity with time obtained an average percentage of 87.77 with a very practical category. The attractiveness aspect obtained an average percentage of 82.77 with a very practical category. This means practical learning modules according to students.

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materials that help students in independent learning.

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