THE DEVELOPMENT OF CHEMISTRY TEACHING MODULE SMA/MA BASED GUIDED INQUIRY TO IMPROVE STUDENTS' ACHIEVEMENT ON HYDROLISIS SALT CONTENT

[1)]Anang Sudigdo, [2)]Ryzal Perdana

[1]Doctoral Student of Indonesia Language Education, Universitas Sebelas Maret, Surakarta, Indonesia,
[2]Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia.

Abstract

This development study aims to determine: (1) the characteristics and the feasibility of the chemistry teaching module based on the guided inquiry of salt hydrolysis development results (2) the effectiveness of learning using a chemistry teaching module based on the guided search on hydrolysis salt content. This research is Educational Research and Development. Module development model used is the model 4D (four D model), which consists of define, design, development, and disseminate. The researcher took two classes of each school for sampling in conducting experiments of module testing. It aims to compare the improvement in student learning outcomes in the experimental class and control class in each school. The study was conducted in SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'Arif 5 Sekampung Kab. East Lampung in the academic year 2014/2015. The results showed that the stage of development chemistry teaching module based on guided inquiry has been through define, design, development, and disseminate. The step of chemistry teaching module based on guided inquiry consists of formulating the problem, making hypotheses, collecting data, analyzing the data, and making conclusions. The results also showed that the module gains the criterion of "very good," which means compatible with using in the learning process. The results also showed that there is an improvement in student learning outcomes after using a chemistry teaching module based on guided inquiry. Statistical test results in SMA N 1 Pekalongan indicates that there are significant differences between the effects of experimental class with control class, the significance level $\alpha = 0.05$. Statistical test results in SMA N 2 Sekampung show that there are significant differences between the effects of experimental class with control class, the significance level $\alpha = 0.05$. Statistical test results in MA Ma'Arif 5 Sekampung shows that there are significant differences between the effects of experimental class with control class, the significance level $\alpha = 0.05$, which mean that the results of student learning using chemistry teaching module based on guided inquiry is better than students that using conventional learning.

Keywords: Module, Guided Inquiry, Learning Outcomes

Introduction

Science or Natural Sciences (IPA) is one of the requirements in the mastery of science and technology. Chemistry, as one of the basic sciences in science, has a big part in the progress of science and technology. This is marked by the development of technology in all fields that apply chemical concepts. However, in reality, chemistry learning achievement nationally is still considered low and not optimal.

Many students still think that chemistry is one of the subjects that is difficult to understand so that the motivation of students to study chemistry is low. Based on the results of the questionnaire analysis of the needs of students, it can be seen that the material of salt hydrolysis is one of the materials that are difficult to understand because, in this material, students' 2013 UN scores are still low. The subject matter of Salt Hydrolysis is a stabilization material from the previous material. This material will discuss the definition of hydrolysis solution, how it works, the determination/calculation of pH, and its application in everyday life.

Teachers are not understood as the only source of learning but must be able to plan and create other learning resources to create a conducive learning environment "(Yudhi Munadi, 2010: 5). This opinion reinforces that teachers need to continue to develop media to support learning. Weak understanding of student concepts is also due to the knowledge undertaken by the teacher, in general, is still teacher-centered. The score is not maximal because the learning carried out yet does not pay attention to students' thinking abilities and is less attractive. Though the knowledge obtained by students through the activities of discovery and analysis of students themselves will be able to last longer in memory when compared to be received by other methods.

The curriculum currently in effect is the 2013 curriculum. Based on the Ministry of Education and Culture Regulation Number 69 of 2013 Concerning the Basic Framework and Structure, the SMA / MA curriculum states that the 2013 curriculum was developed with perfecting mindsets including teacher-centered learning being student-centered, passive learning becoming active learning seeking.

Chemistry learning should be taught starting from observing the phenomena, conceptualizing, then symbolizing. This is following the characteristics of learning chemistry, which emphasizes the science process skills as proclaimed in BSNP (2006). One of the learning-oriented development of science process skills is inquiry learning. An inquiry-based learning approach (inquiry) is supported on knowledge of the learning process that has emerged from research (Bransford et al. 2000).

The guided inquiry method is the inquiry approach by the teacher guiding students to carry out activities by giving initial questions and directing a discussion. The teacher has an active role in determining the problem and the stages of its solution. With this approach, students learn to be more oriented towards guidance and guidance from the teacher so students can understand the concepts of the lesson. In this approach, students will be faced with relevant tasks to be completed either through group discussions or individually to be able to solve problems and draw conclusions independently.

Based on the questionnaire, the teacher needs obtained information that teachers very rarely use the method of inquiry in learning chemistry, so researchers decided to apply the guided inquiry method. Research from Matthew and Kenneth (2013) shows that students who are taught using the guided inquiry learning method have better achievement scores than students who learn by using conventional learning methods.

The factors revealed above give the conclusion that there needs to be an innovation in the learning process, one of which is by making teaching materials under the characteristics of the material to be delivered. According to Ibrahim cit. Trianto (2012: 98) that "Teaching material is a set of teaching material/substance

(teaching material) that is arranged systematically, reflecting the competencies that students will master in learning activities."

According to Briggs cit. Arif et al. (2010: 6) that "the media are all physical tools that can present messages and stimulate students to learn. Books, films, tapes, frame films are examples. " One of the teaching media that students can use for independent learning is in the form of modules. "Modules are teaching materials that can be used by students to learn independently with the minimum possible help from others" (Yudhi Munadi, 2010: 99). These opinions explain that in the learning process media is needed to attract students' motivation and curiosity about the lesson, one of the media that can be developed is in the form of modules because they can be used by students to learn independently and increase the reading interest of Indonesian students who are still below average. Average neighboring country.

This research is the development of a chemistry learning module using guided inquiry base on salt hydrolysis material. The use of guided inquiry approaches in making chemical modules aims to make students more active in the learning process, not only in school but also helps students to learn independently to find a concept in chemistry learning.

The objectives of this study are to (1) Determine the characteristics of the chemistry module based on guided inquiry with the subject of salt hydrolysis developed, (2) Know the characteristics of the chemistry module based on guided inquiry with the subject of salt hydrolysis developed (3) Know the effectiveness of learning using the Learning Module Guided Inquiry-based Chemistry based on Salt Hydrolysis.

Research methods

This research is a research and development (R & D) that aims to develop guided inquiry-based chemistry modules on salt hydrolysis material for class XI high school students, find out the module's characteristics, find out the module's suitability and improve student learning outcomes after using a chemistry-based module guided inquiry developed.

The model used as a basis for the development of guided inquiry-based chemical modules is the result of the adaptation of the 4-D model (four-D model) proposed by Thiagarajan (1974: 5). The procedure of developing guided inquiry-based chemical modules using the 4-D model. The 4-D model includes define, design, development, and disseminate. Selection of a 4-D model for developing guided inquiry-based chemical modules with the following reasons: 1) Coherent development model. 2) The validation and testing stages of the device make the resulting product better. The sample in this study were students of class XI of SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung. In small-scale trials, the product was tested on 15 students from 5 students of class XI at each school. In the large-scale trial, the product was tested on 78 students who came from class XI of the three schools. In the field test, the product was tested on 80 students from class XI IPA 1, SMA N 1 Pekalongan, XI IPA 3 SMA N 2 Sekampung, and XI IPA 3 MA Ma'arif 5 Sekampung. The instruments used in this research development were questionnaires, test questions, validation sheets, assessment sheets between students, and observation sheets. Data processing in this study was conducted using descriptive analysis, including feasibility analysis and data analysis of learning test results. Data collection methods in this study are questionnaire techniques to determine the feasibility of modules from material experts and media experts as well as student and teacher responses, assessment of learning outcomes of skills and attitudes, test techniques for assessment of learning outcomes of knowledge, and assessment techniques between students for skills and attitude.

At the development stage of the first draft, the module was improved/revised based on advice/input from experts. Before being tested, the module was developed validated by seven experts using the Aiken formula. The criteria

used are if the Index is Greater than or equal to 0.76, the development stage can be continued.

Research Results and Discussion

At the define stage, identifying the problems that exist in the learning process and becomes the basis for designing products in the form of modules that will be made. At this stage, an analysis was conducted on students and teachers, the material and curriculum that had been running at SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung East Lampung Regency.

This stage is an analysis of the needs of students and teachers as well as analysis of materials and curriculum that have been used and implemented in SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung East Lampung Regency. Chemical material that will be developed is salt hydrolysis material. Salt hydrolysis material was chosen based on the 2013 and 2014 UN scores in SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung, still below the average provincial and national UN scores on the KD describing salt hydrolysis and Ksp. Based on data from the UN results in two years in a row the salt hydrolysis material is still below the average for the school level, therefore it means that the material is still classified as difficult material according to students because the absorption capacity is still relatively low compared to the absorption of students in other material. Based on the Republic of Indonesia's Minister of Education and Culture Regulation No. 81 A of 2013 concerning the Implementation of the General Guidelines for Learning Curriculum, the 2013 curriculum adheres to the fundamental view that knowledge cannot be transferred from teacher to student. Students are subjects who can actively search, process, construct, and use knowledge.

For this reason, learning must be related to the opportunities given to students to construct knowledge in their cognitive processes. To truly understand and be able to apply knowledge, students need to be encouraged to work to solve problems, find everything for themselves, and strive to realize their ideas. Based on the Regulation of the Minister of Education and Culture of the Republic of Indonesia No. 65 of 2013 concerning Process Standards, that to strengthen the scientific approach (scientific), integrated thematic (thematic inter-subject learning), and thematic (in a subject) it is necessary to apply disclosure-based learning/research (discovery/inquiry learning).

Based on observations and interviews with chemistry teachers at SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung, it is known that the learning methods used by teachers are still conventional and rarely use inquiry learning models, which means students are not accustomed to learning using inquiry. Hence, researchers decided to use the guided inquiry learning model. Researchers hope that by choosing this guided inquiry method, education will be more effective as indicated by the completeness of student learning outcomes individually and classically. Research from Matthew and Kenneth (2013) shows that students who are taught using the guided inquiry learning method have better achievement scores than students who learn by using conventional learning methods. In guided inquiry, the problem is raised by the teacher or sourced from teaching material. Students work to find answers to these problems under the teacher's intensive guidance (Callaah cit Amri, 2010). The second stage is the design stage. At this stage, the initial draft of the Gterbimbing inquiry-based inquiry is prepared. In addition to the module, other learning tools are also developed that support the learning process. Guided inquiry-based learning was chosen because it can improve student learning outcomes and can improve attitudes. This is under the research of Ibrahim Bilgin (2009), which states that "students who study with guided inquiry have a better understanding of the concept of acid-base and have a more positive attitude." An inquiry-based learning approach (inquiry) is supported on knowledge of the learning process that has emerged from research (Bransford et al. 2000). In inquiry-based

education, children become involved in many activities and use thinking methods like scientists to produce new knowledge. Activities in the inquiry learning strategy are formulating questions that lead to investigative activities, compiling hypotheses, conducting experiments to collect and process data, testing hypotheses by performing data analysis, and formulating conclusions based on findings (Hamdani, 2011). The third stage is the development stage. At this stage, the module is validated, a small-scale trial, a large trial, and a module implementation test in three schools. The results of the validation of two lecturers and material and media experts, five chemistry teachers have good criteria, which means that it can be continued at a later stage. Two chemistry lecturers assessed the appropriateness of content and the appropriateness of presentation on the module, and five chemistry teachers assessed the suitability of language on the module.

Validation used is Aiken validation with the Aiken criteria equal to or more than 0.76 for each assessment item, so the module is said to be valid and can be continued to the next stage, the index value of 0.76 is obtained from the number of return/validators who provide an evaluation of the module that is as many as seven people. The results of the module validation on the feasibility of the content, the feasibility of presentation, and the feasibility of the module language obtained a score range of 0.76 to 1.00 for each item that is rated on the module validation assessment sheet. Therefore the module is said to be feasible to be continued at the next stage. While the aspects assessed, 33 items are grouped on parts 1). Module size contains 2 points about the physical size of the module, 2). Module skin design that includes four facts about the module skin layout, 4 points about the module skin typography, and 2 points about skin illustration module 3). module content design, which contains nine about the module content layout, 8 points about module content typography, and 4 points about module content.

After the validation phase, there are some inputs from the validator to be revised before finally proceeding to the small-scale trial phase.

Table 4.1 Results of revision 1

Before revision	After Revision
In picture 1 it should be given commercial salt subtitles because if it is not given subtitles, it will tend to be the same as picture 2	Change the title of image 1 to picture1. Commercial salt
For writing titles on the module cover, please be proportional, i.e., the salt hydrolysis title font is greater than the guided inquiry-based module title and for other fonts on the cover adjust to the rules	Change the font size on the cover to make it more proportional and by the rules for writing the title on the cover
In the end, the module exam should be added which is not equipped with the answer key so that students can practice working on the question deeper and without the help of the answer key	Add the module exam at the end of the module which includes all the indicators that will be achieved after learning
There are several repeating sentences	Repairing the module section with repeated sentences.

After the first draft was revised based on input from the validators, a draft II was produced. The second draft was subsequently trialed on a small scale to 5 students at SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung East Lampung Regency. Small-scale trials were conducted on grade XI students of 5 students in SMA N 1 Pekalongan, SMA N 2 Sekampung, and MA Ma'arif 5 Sekampung. This small-scale trial aims to see the readability and students' responses to the inquiry-based chemistry module guided in the hydrolysis material salt before being tested on a large trial. Students involved in the trial consisted of 5 students for each school. The readability test results and students' responses to the modules are presented in Table 4.2

Table 4.2 Readability questionnaires' results and student responses to the limited Try-Out

	No	Aspect	Percentage (%)	Criteria
15 Students' Responses	1	Contents	79.16	Good
	2	Language	82.77	Very Good
	3	Presentation	77.77	Good
	4	Graphics	82.77	Very Good

Table 4.2 is the result of the student's readability and response questionnaire, in the table it can be seen that the criteria obtained have fulfilled good criteria, so that it can proceed to the next stage with a little revision and input from the respondents, at the small trial stage also given a questionnaire response to 1 teacher for each school, the results can be seen in table 4.3

Table 4.3 Readability questionnaire results and teacher responses in limited trials

	No	Contents	Percentage (%)	Criteria
3 Teachers' Responses	1	Contents	80.55	Good
	2	Language	77.77	Good
	3	Presentation	69.44	Good
	4	Graphics	69.44	Good

It can be seen from the table above that the criteria obtained have fulfilled good criteria so that it can proceed to the next stage with a little revision and input from the respondents. According to Riduwan (2008), if these aspects get an assessment with a percentage of ≥ 61% according to the Likert scale, then the Module is said to be feasible. After a small trial of 15 students and three teachers, there was a suggestion for the guided inquiry-based Chemistry module, one of the suggestions was to revise the header footer section of the module because it was less attractive and out of sync with the color of the module, the other suggestion was to change the color of the sheet the hypothesis becomes brighter so that when students write a hypothetical bias, it is seen more clearly, based on suggestions and input from small-scale trials, the module is revised and produces a draft module III which is then tested on a large scale to 1 class for each school and given a questionnaire response and readability to be more valid in the development of guided inquiry-based chemistry modules. The results of the questionnaire responses of students at this stage get good criteria so that it can be continued at the next stage, in this large trial, the number of students as respondents numbered 78 students. In contrast, the number of teachers as respondents there was 5 teachers, for the questionnaire responses from the teacher mem get very good criteria. After a large trial of 78 students and five teachers, there were suggestions for the Guided Inquiry-based Chemistry module that was developed. One of the suggestions and input from respondents is that for the front cover, it should add the high school semester so that it is clearer to use the high school module in what semester it is intended, for writing the study program the reader is still confused because the cover is written in chemical science education. In contrast, in the module only science education, for writing inquiry-based modules, it is better to add the inquiry-based chemistry module to be more specific when the reader sees the cover. Based on input from respondents, a revision was made. After the revision, the module implementation tests were carried out in three schools using two classes for each school, namely one class as an experimental class that received learning treatment using a guided inquiry-based chemistry learning module, while for the control class using conventional learning namely learning using a teacher's handbook from the Ministry of National Education.

Before the guided inquiry inquiry-based chemistry module is implemented in learning, students are given a pretest and posttest in each of the experimental and control classes. The test results consist of 16 multiple-choice questions. One lecturer and one chemistry teacher have validated the questions used. The pretest has also

been tested for reliability, and the item analysis was analyzed using a test of distinguishing power and difficulty levels. The grid, about student learning outcomes used for the pretest and posttest questions, are in the appendix

In the experimental class, after the pretest, students are given a guided inquiry-based chemistry module. The guided inquiry-based chemistry module is used as a core module for teaching and learning in the classroom. After the learning material using the module is finished, then students are given a posttest question.

In the control class, after the pretest, students carry out the learning as usual by the teacher, using the chemistry textbooks available at the school. After learning is finished, students are then given a posttest.

The module implementation is done to see the improvement of student learning outcomes using modules and not using modules. Because the class used to implement modules consists of experimental classes and control classes, the progress of student learning outcomes skills is seen from the increase in the average scores of the pretest and posttest respectively then each class was compared between the improvement of student learning outcomes in the control class and the experimental class.

Learning outcomes in both classes can be known by means of the different mean tests, but before the average difference test is carried out, the prerequisite test analysis is carried out using the normality and homogeneity test. Class testing uses two classes, namely the experimental class and the control class for each school. Learning outcomes in the experimental class in the form of pretest and posttest. The results of the pretest at SMA N 1 Pekalongan obtained significance 0.055 greater than $\alpha = 0.05$, so accept Ho, which means the data is normally distributed. Then the significance of the posttest score of 0,000 has a value smaller than $\alpha = 0.05$, which means reject Ho or the data are not normally distributed.

Then for the control class in the normality test obtained pretest data significance value of 0.01, which means the data are not normally distributed, the posttest has a significance value of 0.01, which means the data is not normally distributed. After a normality test is done on both classes then homogeneity tests are then performed for the pretest and posttest values of the two classes, for the achievement of the significant value of 0.166 which is greater than $\alpha = 0.05$ so accept Ho which means the data is homogeneous distribution, then for the second posttest value class has a significance value of 0.754 which is greater than $\alpha = 0.05$ so accept Ho which means homogeneous data distribution

Furthermore, for SMA N 2, the results of the pretest in the experimental class obtained a significance of 0.942 greater than $\alpha = 0.05$, so accept Ho, which means the data is normally distributed. Then the significance of the posttest value of 0.022 has a value smaller than $\alpha = 0.05$, which means reject Ho or the data are not normally distributed.

Then for the control class in the normality test obtained pretest data significance value of 0.159, which means the data is normally distributed, the posttest has a significance value of 0.01, which means the data is not normally distributed. After a normality test is done on both classes, then homogeneity tests are performed for the pretest and posttest values of the two classes, for the achievement of the significant value of 0.862 which is greater than $\alpha = 0.05$ so accept Ho which means the data is homogeneous distribution, then for the second posttest value class has a significance value of 0.967 which is greater than $\alpha = 0.05$ so accept Ho which means homogeneous data distribution

Furthermore, for MA Ma'arif 5, A sample of the results of the pretest in the experimental class obtained significance of 0.064 greater than $\alpha = 0.05$, so accept Ho, which means the data is normally distributed. Then the significance of the posttest value of 0.005 has a value smaller than $\alpha = 0.05$, which means reject Ho or the data are not normally distributed.

Then for the control class in the normality test obtained pretest data significance value of 0.50, which means the data are normally distributed, the posttest has a significance value of 0.008, which means the data is not normally distributed. After a normality test is done on both classes, then homogeneity tests are performed for the pretest and posttest values of the two classes, for the achievement of the significant value of 0.747, which is greater than α = 0.05, so accept Ho which means homogeneous data distribution. For the second posttest value class has a significance value of 0.456, which is greater than α = 0.05, so accept Ho, which means homogeneous data distribution.

After completing the analysis prerequisite test, then the next test is performed using a non-parametric test, the non-parametric test used is Wilcoxson test, a non-parametric test is used because when tested for analysis prerequisites there is one data that is not normally distributed.

At SMA N 1 Pekalongan, a significance value of 0,000 was found to be lower than the value of α = 0.05, so Ho was rejected, meaning that there was a significant difference between the students' pretest and posttest scores.

At SMA N 2 Sekampung there is also one data that is not normally distributed, therefore a non-parametric test was performed using the Wilcoxson test, from the calculation results obtained a significance value of 0,000 which is smaller than the value of α = 0.05, so Ho is rejected meaning that there are significant differences between students' pretest and posttest scores.

Furthermore, for trials in MA Ma'arif 5 school, there is also one data that is not normally distributed, then continued with nonparametric tests using the Wilcoxson test, from the calculation results obtained a significance value of 0,000 which is smaller than the value of α = 0.05. Hence, Ho rejected means there is a significant difference between the students' pretest and posttest scores.

Based on the data described above, it can be concluded that learning in the experimental class is better than the control class, where in the experimental class, students are treated with the use of instructional materials in the form of guided inquiry-based chemistry modules.

An increase in the average score of learning outcomes in experimental class trials for SMA N 1 Pekalongan by 51.50. Then in the control class, the average score increased learning outcomes by 48.75. At SMA N 2 Kampung, the experimental class was 51.56. Then the control class was 44.41. In MA Ma'arif 5, the experimental class was 54.16, and then the control class was 49.07.

In testing, the implementation of this module also filled in the questionnaire responses by students and teachers as material for revision if there are input and suggestions on the development of a guided inquiry-based chemistry module. In contrast, the number of students at this stage in the three schools used as a sample is 80 students, while for teachers who were given a questionnaire response amounted to 6 teachers, namely two teachers at each school. The results of student response questionnaires can be seen in table 4.4

Table 4.4 Readability of questionnaire results and student responses to field trials

	No	Contents	Percentage (%)	Criteria
80 Students' Responses	1	Contents	80.55	Very Good
	2	Language	90.10	Very Good
	3	Presentation	86.56	Very Good
	4	Graphics	83.54	Very Good

In the table, it can be seen that the results of the analysis of the readability questionnaire and students' responses to the module have very good criteria, which means the module can be used and good for learning and meet the criteria for the next stage, which is disseminated. While

the results of the teacher's readability and response questionnaire can be seen in table 4.5

Table 4.5 Readability of questionnaire results and teacher responses to field trials

	No	Contents	Percentage (%)	Criteria
6 Teachers' Responses	1	Contents	91.66	Very Good
	2	Language	90.27	Very Good
	3	Presentation	93.05	Very Good
	4	Graphics	93.05	Very Good

In the readability questionnaire table and the response given to the teacher, it can be seen that the results are included in the very good criteria, which means that the module is feasible to be used in learning and can be carried out to the next stage, which is disseminated. The fourth stage is the disseminate stage. During the distribution stage, a guided inquiry-based chemistry module on salt hydrolysis material was distributed to 5 high school / MA schools in East Lampung Regency. The distribution was carried out at SMA Negeri 1 Batanghari, SMA Negeri 2 Sekampung, SMA Kosgoro Sribhawono, SMA Negeri 1 Sekampung, MA Ma'arif NU 5 Sekampung, and after being given an inquiry-based chemical module guided in salt hydrolysis material, teachers were given a questionnaire to find out teachers' responses to the modules that have been developed. Teachers' responses to the guided inquiry-based chemistry module on salt hydrolysis material are presented in table 4.6.

Table 4.6 Chemistry teacher responses to guided inquiry-based chemistry modules

	No	Contents	Percentage (%)	Criteria
5 Teachers' Responses	1	Contents	91.66	Very Good
	2	Language	91.66	Very Good
	3	Presentation	91.66	Very Good
	4	Graphics	95.00	Very Good

Response 5 Teacher No Aspect Percentage (%) Criteria 1 Contents 91.66 Very Good 2 Language 91.66 Very Good 3 Presentation 91.66 Very Good 4 Graphics 95.00 Very Good The stages of this distribution aim to further refine the chemical method of guided inquiry-based chemistry, so that at this stage a questionnaire is given to each teacher at the school visited. The questionnaire distributed with the module is also given a suggestion column to provide suggestions or suggestions. From the results of the distribution of questionnaires in 5 high schools in East Lampung Regency, a percentage of 92.5% was obtained or with very good criteria. National Education Office cit. Andi Prastowo (2011: 104) states that "the module is interpreted as a notebook with the aim that students can study independently without or with the guidance of the teacher." This opinion is by the positive response given by the teachers because the teacher needs a book that still works well when students study independently at home.

Conclusion

Based on the results of data analysis and discussion that has been carried out, it can be concluded:

1. The guided inquiry-based learning module has been through the stages of define, design, develop, and disseminate. The guided inquiry-based learning module has the steps of learning to formulate a problem, formulate a hypothesis, collect data, analyze and draw conclusions.
2. Student response questionnaire on the broad trial/module implementation obtained an assessment in the category of "Very Good." In contrast, the teacher's response questionnaire received an assessment in the "Very Good" category. So guided inquiry-based chemistry learning modules are feasible to be used in the learning process.

3. There is an increase in student learning outcomes after using a guided inquiry-based chemistry module. It can be seen from the comparison of the average score of improvement in student learning outcomes of experimental classes using a guided inquiry-based chemistry module, for SMA N 1 Pekalongan which is 51.50 higher of the average increase compared to the control class that does not use the module that is developed is 48.75 Then for SMA N 2 Sekampung in the experimental class the average increase in learning outcomes was 51.56 while the control class was 44.41. For MA Ma'arif 5 Village in the experimental class, the average increase in learning outcomes was 54.16 while in the control class was 49.07. Statistical test results show the significance value is lower than the significance level $\alpha = 0.05$ (95% confidence level) so that it can be concluded that the learning outcomes using guided inquiry-based chemistry learning modules are better than conventional learning.

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