IMPLEMENTATION OF GUIDED INQUIRY LEARNING MODEL TO PRACTICE CRITICAL THINKING SKILL ON CHEMICAL EQUILIBRIUM MATERIAL AT SMA NEGERI 1 PROBOLINGGO

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Abstrak

Penelitian ini bertujuan untuk mendeskripsikan keterlaksanaan pembelajaran, aktivitas peserta didik, keterampilan berpikir kritis, hasil belajar, dan respon peserta didik terhadap penerapan model pembelajaran inkuiri terbimbing. Metode yang digunakan dalam penelitian ini adalah metode pengamatan, tes, dan angket. Hasil penelitian menunjukkan bahwa keterlaksanaan pembelajaran melalui penerapan model pembelajaran inkuiri terbimbing memperoleh persentase keterlaksanaan pembelajaran pada pertemuan I, II, III masing-masing sebesar 86,11%, 94,11%, dan 94,44% sehingga penerapan model pembelajaran inkuiri terbimbing pada pertemuan I, II, dan III terlaksana dengan sangat baik. Aktivitas peserta didik berdiskusi dengan teman mempunyai presentase yang paling besar pada pertemuan I, dan II masing-masing sebesar 26% dan 24% sedangkan pada pertemuan III aktivitas peserta didik memperhatikan penjelasan guru mempunyai presentase yang paling besar dengan presentase 23,61%. Ketuntasan hasil belajar peserta didik secara klasikal melalui penerapan model pembelajaran inkuiri terbimbing mencapai 89,6%.Keterampilan berpikir berpikir kritis peserta didik yang dilatihkan mengalami peningkatan dari sebelum dan sesudah penerapan model pembelajaran inkuiri terbimbing dengan skor N-*gain* sebesar 0,75 pada kriteria tinggi. Selain itu, respon peserta didik melalui penerapan model pembelajaran inkuiri terbimbing memperoleh presentase sebesar 95,4% dengan kategori sangat baik.
Kata kunci: inkuiri terbimbing, keterampilan berpikir kritis, kesetimbangan kimia.

Abstract

This research aimed to describe the learning feasibility, the activity of learners, learning outcomes, critical thinking skills, and the response of students to the implementation of guided inquiry learning model. The method used in this research is observation, test and questionnaire method. The results showed that the learning feasibility through the implementation of guided inquiry learning model to obtain the percentage of learning feasibility at meeting I, II, III respectively by 86.11%, 94.11% and 94.44%, so that the implementation of guided inquiry learning model at meeting I, II, and III can be implemented very good. Students' activity discussing with friends have greatest percentage at meeting I and II respectively 26% and 24%, while at meeting III students' activity of pay attention to the teacher's explanations have greatest percentage with the percentage of 23.61%. The completeness of students' learning ourcome in the classical through the implementation of guided inquiry learning model reaches 89.6%. Students' critical thinking skills that practiced has increased from before and after the implementation of guided inquiry learning model with N-*gain* score of 0.75 at the high criteria. Moreover, the response of the students through the implementation of guided inquiry learning model obtained percentage of 95.4% with very good category.
Keywords: guided inquiry, critical thinking skills, chemical equilibrium.

INTRODUCTION

The development of Science and Technology is currently changing very rapidly. Education also was renewed from time to time and never stopped. Education as a conscious and deliberate effort to create an atmosphere of learning and the learning process so that learners are actively developing the potential for him to have the spiritual power of religion, self-control, personality, intelligence, noble character, and skills needed him, society, nation and state [1]. To face tough challenges are important for improving the quality of education. One effort to improve the quality of education is the improvement of human resources quality.

Qualified human resources can be obtained by improving the quality of learning. Chemistry is a science that includes clumps of science that studies everything about the substance that covers the composition, structure and properties, changes, dynamics and energetics of substances that involve the skills and reasoning [2]. Science learning process emphasizes providing direct experience to develop the competencies that students are able to explore and understand the universe around scientifically.

Based on the purpose and function of chemical subjects in senior high school of which is to develop a scientific attitude that covers critical attitude towards scientific questions, that is not easy to believe without the support of the results of empirical observation, understanding the concepts of chemistry and its implementation to solve the problems in the technology and life daily [3]. Critical thinking skills is the ability to think rationally and reflective based on what is believed or done. There are five aspects of critical thinking skills, namely; 1) gives a simple explanation, 2) build basic skills, 3) concluded, 4) provide further explanation, and 5) a set of strategies and tactics. The fifth aspect is divided into 12 indicators, including; 1) focus on the question, 2) analyze arguments, 3) consider whether the source can be trusted, 4) induces and consider the results of induction, 5) create and determine the result of consideration [4]. Curriculum 2013 was developed with the improvement mindset into a passive learning and critical constructivist learning [2].

Based on the pre-research teacher's questionnaire, obtained the information that at SMAN 1 Probolinggo still not been practiced critical thinking skills on the grounds of lack of time in the learning process and the need for preparation so that the need to practice critical thinking skills in students at SMAN 1 Probolinggo. This is consistent with the research that that students still passive, listening quietly without being able to develop information obtained [5]. Beside that the students never practice critical thinking during class discussions [6].

Learning on the chemical equilibrium material in SMAN 1 Probolinggo often implement the learning models such as cooperative and direct instruction. However, based on the pre-research showed that 57.7% of students scored below the minimum completeness criteria. It is also consistent with the description of one of the teachers at SMAN 1 Probolinggo that the completeness and learning

outcomes of students in Chemical Equilibrium material is still less than 75%.

To help students learn the material in chemical equilibrium, learners should have the opportunity to acquire and find concepts through their own experience that through practicum. Practical activities give students the chance to experience for themselves, follow a process, observe an object as well as the state of a process [7]. Guided inquiry learning model is one of the learning model suggested in the curriculum 2013 and requires students to construct their own knowledge [8]. Practicum model guided inquiry will encourage students to be actively involved to find a concept or self-knowledge using the scientific method. Syntax inquiry learning model in general is the orientation, formulating the problem, formulating hypotheses, gathering data, testing hypotheses, and formulate conclusions [9].

Based on the exposure above, needed a solution to the implementation of guided inquiry learning model to practice critical thinking skills on the chemical equilibrium material at the SMAN 1 Probolinggo. Critical thinking skills are practiced is the focus of questions, analyze the arguments, consider whether a source is reliable, induce and consider the results of induction, create and determine the outcome of consideration as it relates to syntax learning model guided inquiry where the syntax according to the syntax of inquiry learning model in general however, the answer the question is not given by teachers, students must find themselves under the guidance of the teacher. Therefore, it is need to do

research, entitled *"Implementation of Guided Inquiry Learning Model to Practice Critical Thinking Skills on Chemical Equilibrium Material at SMAN 1 Probolinggo"*.

METHOD

Research that done is a kind of pre-experimental research conducted in a group without a comparison group with one group pretest posttest.

$$O_1 \qquad X \qquad O_2$$

Description:

O_1 = test before being given treatment (pretest)

X = treatment using guided inquiry learning model

O_2 = test after being given treatment (posttest)

The targets of this research is the students of SMAN 1 Probolinggo with samples of XI MIA B class in 2015/2016 school year as many as 31 students who had not received submaterial factors that affect chemical equilibrium.

The device used in this research is the syllabus, lesson plans and worksheets while the instrument used is the observation sheet of learning feasibility and students' activity, the test sheet of students' learning outcome and critical thinking skills are practiced, and the questionnaire.

Data collection methods include observation, test and questionnaire method. Observation method consists of observation learning feasibility to measure the implementation of learning syntax according to lesson plans and activities that have been prepared students to know the activities undertaken by participants as well as

students during the learning process using the guided inquiry learning model. The test method consists of a test of learning outcomes in the form of multiple choice questions and tests critical thinking skills such as problem description. The questionnaire method used to determine the response of students to the learning undertaken. The data analysis technique was used the analysis of feasibility of data guided inquiry learning model using the following formula:

$$\% \text{ implementation} = \frac{\Sigma \text{ score of implemented phase}}{\Sigma \text{ maximum score of overall phase}} \times 100\%$$

Students' activity were analyzed using the following formula:

$$\% \text{ activity} = \frac{\Sigma \text{ frequency appear activity}}{\Sigma \text{total frequency}} \times 100\%$$

Learning outcomes obtained from the *pretest* and *posttest* were analyzed using the following formula:

$$\text{The value of learning outcome} = \frac{\text{score obtained}}{\text{maximum score}} \times 4$$

To determine the completeness classically analyzed using the following formula:

$$\text{Classical completeness} = \frac{\Sigma \text{students completed}}{\Sigma \text{students}} \times 100\%$$

The difference value learning outcomes of students from pretest and posttest analyzed using a paired two-sample test (paired samples t test) with the hypothesis:

H_0: there is no significant difference between the average value of pretest and posttest

Ha: there is a significant difference between the average value of pretest and posttest

Test two paired samples were performed using SPSS say there is a significant difference if t <t table with a standard error of 5% [10].

Critical thinking skills data were analyzed using the following formula:

$$\text{The value of critical thinking skill} = \frac{\text{score obtained in an indicator}}{\text{overall score in an indicator}} \times 100$$

Differences critical thinking skills from the results of pretest and posttest scores were analyzed using N-gain formula:

$$< g > = \frac{\text{posttest value} - \text{pretest value}}{\text{maximum value} - \text{pretest value}}$$

The response of students was analyzed using the following formula:

$$\% \text{ response} = \frac{\Sigma \text{ yes answer}}{\Sigma \text{ maximum yes answer}} \times 100\%$$

RESULT AND DISCUSSION

The research results of implementation of guided inquiry learning model in chemical equilibrium material includes observation learning feasibility using guided inquiry learning model, observation of activities of students during the learning process, learning outcomes and critical thinking skills, as well as the responses of students to the learning undertaken.

Learning feasibility using guided inquiry learning model observed by two observers, namely chemistry student of Unesa. Feasibility data of inquiry learning derived from observations of two observers through observation sheet of guided inquiry learning that has been developed together with the observation assessment rubric as a reference in the

learning feasibility observes. The average of learning feasibility activities at the meeting of I, II, and III respectively by 86.11%, 94.11% and 94.44%, so that the implementation of guided inquiry learning model during the three meetings can be done very good.

During the learning process using guided inquiry learning model is closely related to the activities of students. At the meeting I and II, the activities of learners discussing with friends mempunyaii greatest percentage ie, 26% and 24%, while at the third meeting, the activity of the students pay attention to the teacher's explanation has the greatest percentage compared with other events with a percentage of 23.61% , That is because at the meeting I and II learners perform direct experiments in the laboratory to test the hypothesis, while the third meeting of learners do not do experiments directly but watching the video experiment thus affecting the frequency of the activity of the students discuss with friends. The smallest percentage of student' activities are doing other activities that are not in accordance with the teaching and learning activities in the first meeting with a percentage of 1.33%, the second meeting of 2%, and the third meeting of 0.69%. That is because teachers manage classroom conditions well so that learners do learning activities in accordance with the lesson plan.

There are three students who did not complete and 26 other students so thoroughly classical completeness of 89.6%. That is because the cognitive development is largely determined by the child's active manipulation and interaction with the environment. Piaget believes that the experiences of physical and environmental manipulation is vital to the development of the changes. Meanwhile, social interaction with peers, especially arguing and discussion helps clarify thoughts that eventually load it into a more logical thinking [11].

The results of test of two paired samples can be seen that the value of t is -19.394 -2.048 and t table is that the value of t <t table. This means that the hypothesis Ha accepted where there is a significant difference between the average value of pretest and posttest so that it can be concluded that the implementation of guided inquiry learning model can improve student learning outcomes.

Critical thinking skills are measured using a pretest and posttest in the form of a description about which consists of 10 questions. Critical thinking skills are practiced is the focus of questions, analyze the arguments, consider whether a source is reliable, induce and consider the results of induction, create and determine the outcome of consideration. Result of students' critical thinking skill based on pretest and posttest value are presented in Figure 1.
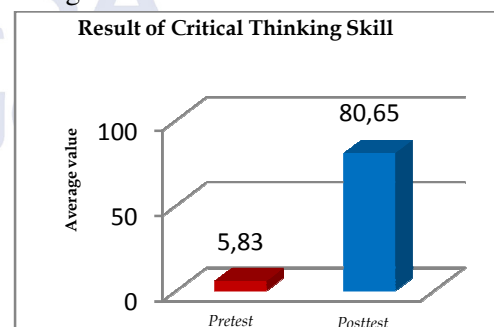

Figure 1 Result of Critical Thinking Skill

Differences critical thinking skills of students before and after the

implementation of guided inquiry learning model is known to use N-gain scores. Scores N-gain can be obtained by knowing the difference between pretest posttest and then divided by the difference between the maximum value for each indicator critical thinking skills and the pretest. Results of the analysis of N-gain scores are presented in Table 1.

Table 1 The result of analysis of N-Gain score

No	Average of pretest score	Average of posttest score	N-gain score	Criteria
1	1	2,3	0,65	Medium
2	1	2,2	0,40	Medium
3	0	1,7	0,85	High
4	0	1,6	0,80	High
5	0	2,4	0,80	High
6	0	3,5	0,88	High
7	0	2,6	0,87	High
8	0	2,6	0,65	Medium
9	0	1,5	0,75	High
10	0	2,7	0,90	High
Average			0,75	High

Based on the data in Table 1, it can be concluded that the critical thinking skills that practiced increased after the guided inquiry learning model is implemented to the chemical equilibrium material despite the scores obtained higher scores approaching the threshold criteria N-gain in the amount of 0.75 [12]. However, it is appropriate curriculum expectations in 2013 were developed with the improvement mindset into a passive learning and critical constructivist learning [2].

The response of students to the implementation of guided inquiry learning model on the material tchemical equilibrium to practice critical thinking skills known through the questionnaire responses given to students after learning using guided inquiry learning model. Based on data from the questionnaire responses of students known that the implementation of guided inquiry learning model on the material for the chemical equilibrium to practice critical thinking skills of students of class XI MIA B at SMAN 1 Probolinggo get a very good response to the percentage of the overall response to the statement amounted to 95.4%, That's because students feel happy, more familiar with the material presented, and the more active during the learning process. In addition, the implementation of guided inquiry learning model can improve students' critical thinking skills.

CONCLUSION

Based on the results of data analysis and discussion of the implementation of guided inquiry learning model to practice critical thinking skills on chemical equilibrium material at SMAN 1 Probolinggo, it can be concluded that:

1. Learning feasibility through implementation of guided inquiry learning model in chemical equilibrium material shows the percentage activities at the meeting I, II, III respectively by 86.11%, 94.11% and 94.44%, so that the implementation of the guided inquiry learning model at a meeting I, II, and III can be implemented very good.

2. Students activity discuss with friends having the greatest percentage ie, 26% and 24% at the meeting I and II, while at the third meeting, the activity of the students pay attention to the teacher's explanation has the greatest percentage compared with other events with a percentage of 23.61 %.

3. Classical completeness through the implementation of guided inquiry learning model achieve 89.6%.
4. The critical thinking skills of students who practiced through implementation of guided inquiry learning model in chemical equilibrium materials has increased from before and after the implementation of guided inquiry learning model with a score of N-gain of 0.75 at the high criteria.
5. Students response through the implementation of guided inquiry learning model on material chemical equilibrium get a percentage of 95.4% with very good category.

SUGGESTION

Here is outlined suggestions to the research the of implementation of guided inquiry learning model melatihkan remedy critical thinking skills on the chemical equilibrium material at SMAN 1 Probolinggo, namely:

1. The guided inquiry learning model can be implemented to other materials accordance with the characteristics of the model to practice critical thinking skills.
2. Critical thinking skills should be practiced continuously so that students are accustomed to think critically and logically.

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