THE APPLICATION OF GUIDED INQUIRY MODEL IN THE TOPIC OF REACTION RATE TO INCREASE STUDENTS’ LEARNING OUTCOME AND ACTIVITIES AT MAN BANDA ACEH 1

1Habibati, 2Muhammad Nasir, 3Wahyuni

1,2,3Universitas Syiah Kuala, Banda Aceh, Indonesia

habibati581@yahoo.com

ABSTRACT

The research aims were to improve students’ learning outcome and activities at MAN Banda Aceh 1 in the topic of reaction rate by implementing guided inquiry model. The research type used is descriptive with qualitative and quantitative approaches. The research subjects were students at XI IPA 4 class which consisted of 10 male and 21 female students. The data collection technique used were observation, test, and questionnaire. The instruments used were students’ activities, attitudes, and skill evaluation sheets, question sheets, and student’ questionnaire sheet. The research results after the application of guided inquiry model showed that the average percentage of students learning outcome for cognitive, skills, and attitudes domains were 81.50%, 80.50% and 81.00% respectively. The average percentage of students’ activities in session I, II, and III obtained were 76.25%, 84.13%, and 83.33% in a row. The average percentage of students’ response gained was 86.70% which was considered as very good criteria. It could be concluded that the application of guided inquiry model could improve students’ learning outcome and activities in the topic of reaction rate.

Keywords: guided inquiry model, learning outcome, reaction rate

INTRODUCTION

One of the chemistry topics taught at senior high school is reaction rate. Reaction rate is a topic which combines concepts and mathematical chemistry calculation so the students are required to be able to measure, and predict the chemical reaction rate.

Based on the preliminary study done in October 2015 at MAN Banda Aceh 1, it showed that this school had just implement 2013
curriculum for XI class in odd semester. As a result, in teaching chemistry lesson the chemistry teachers had seldom used learning model required in 2013 curriculum. However, their instructions were still dominated by conventional way of teaching. Therefore, the students were less motivated to learn and seemed not active in developing their capabilities and capacities. This situation affected their learning performance in the topic of reaction rate in which in the academic year of 2014/2015 only 45% of the students achieved minimum mastery score of 75. Furthermore, in the National Testing results in the academic year of 2013/2014 for this topic, the average percentage of students’ mastery score was 62.35%.

One of the ways to minimize this problem might be by applying inquiry model as one of learning models demanded by the government for implementation 2013 curriculum. The inquiry learning model consists of free inquiry, modified free inquiry, and guided inquiry (Mulyasa, 2005). In this study, the researcher used guided inquiry model as its main focus.

Guided inquiry model is a model in where the teacher guide the students to do activities by giving pre-queries and then directing them to do group discussion. The teacher’s guidance will be reduced as the increased of students’ understanding to the concepts being learned. In other words, the teacher’s role was as facilitator, motivator, and mentor. Thus, the students could understand the lesson better, be active, and be able to solve problems and to draw conclusions by themselves through the teacher’s direction (Nasution, 2014). The guided inquiry model steps as proposed by Trianto (2011) are (1) presenting problems, (2) making hypothesis, (3) designing practicum, (4) doing practicum, (5) collecting data, (6) analyzing data, (7) drawing conclusion, and (8) presenting the results.

Maulidiawati and Soeprojo (2014) in her study concluded that the average value of the students’ learning outcome in the experimental class (i.e. 79.36) was higher than in the control class (i.e. 76.70) through the implementation of Process Oriented Guided Inquiry Learning (POGIL) on the topic of solubility and solubility product at XI IPA class in SMA Negeri 8 Semarang. It was supported by the study results from Setiowati, Agung, and Widiantuti (2015) who argued that the application of guided inquiry model supported by students’ work sheet could improve students’ activities percentage from 52% in cycle I to 80% in cycle 2 in XI MIA 1 class in SMAN 1 Banyudono, Boyolali in the topic of solubility and solubility product.
The Application of Guided Inquiry Model in the Topic of Reaction Rate to Increase Students’ Learning Outcome and Activities at Man Banda Aceh 1. (Habibati, Muhammad Nasir, Wahyuni)

METHODS

The research approach used were qualitative and quantitative approach with the research type of descriptive. This research was done in MAN Banda Aceh 1 which is located in PocutBaren Street Number 116, GampongKeuramat, Banda Aceh. This research was done in September 2015 until February 2016.

The research subjects were students in XI IPA 4 which consisted of 10 male and 21 female students. This class was chosen by using purposive technique sampling as its students tend to be less motivated in learning chemistry lessons and thus the majority of students’ learning performance results were unsatisfactory. Collecting data technique used were test, observation, documentation, and questionnaire, whereas the instrument used were students’ work sheet (LKPD), attitude and skills evaluation sheet, activities observation sheet, and questionnaire sheet

DISCUSSION

Students’ Activities

Observation was done by four observers, which was consisted of one chemistry teacher and three undergraduate students in chemistry department, by using students’ activities observation sheet. This sheet was set up according to the Learning Action Plan (RPP) and the guided inquiry model steps. The observation results of students’ activities can be seen in Table 1 as follows:

![Figure 1. The histogram of observation results of students’ activities](image)

The students’ activities were observed throughout the first, the second, and the third meetings. In general, the students’ activities at the topic of reaction rate was in a good category as they had the average...
The Application of Guided Inquiry Model in the Topic of Reaction Rate to Increase Students’ Learning Outcome and Activities at Man Banda Aceh 1. (Habibati, Muhammad Nasir, Wahyuni)

percentages of 76.25% in meeting I, 84.13% in meeting II, and 83.33% in meeting III. Even though, it had a slight decreased in meeting III, however the difference was not significantly affect the students in being active in the learning process (see Table 1).

**Tabel 1.** The recapitulation of students’ activities based on guided inquiry model’s steps

<table>
<thead>
<tr>
<th>Guided inquiry model’s steps</th>
<th>Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Presenting problems</td>
<td>2.75</td>
</tr>
<tr>
<td>Making hypothesis</td>
<td>2.50</td>
</tr>
<tr>
<td>Designing practicum</td>
<td>3.00</td>
</tr>
<tr>
<td>Doing practicum</td>
<td></td>
</tr>
<tr>
<td>Collecting data</td>
<td>3.25</td>
</tr>
<tr>
<td>Analyzing data</td>
<td>3.25</td>
</tr>
<tr>
<td>Drawing conclusion</td>
<td>3.00</td>
</tr>
<tr>
<td>Presenting the results</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17.75</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>2.96</td>
</tr>
<tr>
<td><strong>Percentage (%)</strong></td>
<td>73.96</td>
</tr>
</tbody>
</table>

**Students’ Learning Outcome**

The results of the students’ learning performance were collected from three domains that are affective, cognitive, and skills domains. The affective domain was evaluated through the observation sheet, which was accompanied by its rubric, of the students’ attitude for three consecutive meetings. This process’s aim was to gather knowledge about the students’ attitude during the instructional process. The students’ attitude assessed including discipline, openness, diligence, responsibility, curiosity, and working in group. The data regarding the students’ attitude can be seen in Figure 2.
Based on Figure 2, it can be known that the students’ attitude in the three meetings continued to increase with the total average score was 81% which was in good category. This happened might be due to the students had already accustomed with the model being implemented.

In addition, the students’ skills were observed when the students did practicum in the laboratory on the subtopic of factors that influence the reaction rate during the second meeting. The skills of them were observed by four observers by using observation sheet of students’ skills which was accompanied by its rubric. Overall, the results of students’ skill showed the average percentage of 80.50% which was in good category. This result positively affected the cognitive (students’ performance) in doing practicum.

Furthermore, the students’ learning outcomes were gathered through the score of students’ work sheet (i.e. LKPD) that were given during the second and the third meetings and test score at the end of the third meeting. The test was given as the researcher want to test the students’ understanding or mastery learning regarding the whole subject/topic of reaction rate. The test involved 16 questions which were validated by validator before this study begun. In analyzing these data, LKPD’s and test scores were divided by two to see the final result of students’ learning outcome. The result gained was the average percentage of 81.25% (i.e. good category). From 31 students, there was only 6 students who did not achieve mastery learning (i.e. score of 3.00 for cognitive domain). This can be seen in Figure 3.
The Application of Guided Inquiry Model in the Topic of Reaction Rate to Increase Students’ Learning Outcome and Activities at Man Banda Aceh 1. (Habibati, Muhammad Nasir, Wahyuni)

Figure 3. A histogram of the result of students’ performance during the application of guided inquiry model

Based on the data mentioned above, generally, the application of guided inquiry model could improve students’ learning outcomes as they were involved in the proven of the chemistry concepts being taught through doing experiments in groups. This research was in line with the study’s result conducted by Purnamasari, Leny, and Saidi (2014) which summarized that the application of guided inquiry model which supported by students’ worksheet (LKPD) could increase students’ learning outcome in the topic of buffer solution from cycle I (i.e. 83.18%) to cycle II (i.e. 96.13%). They also mentioned that the students’ activities rose up from 49.75 in cycle I to 58.25 in cycle II. In addition, they also stated that the students’ attitude improved from 38.82 in cycle I to 40.82 in cycle II. Further, the students’ skills were increased from 12.71 in cycle I to 15.57 in cycle II.

Students’ Response

The questionnaire was used to gather an information about the students’ perception regarding the implementation of guided inquiry learning in teaching reaction rate topic. The analysis result of the students’ response can be seen in Figure 4.
The Application of Guided Inquiry Model in the Topic of Reaction Rate to Increase Students’ Learning Outcome and Activities at Man Banda Aceh 1. (Habibati, Muhammad Nasir, Wahyuni)

Figure 4. A histogram of the result of students’ response regarding the application of guided inquiry model

Based on Figure 4, it can be known that the average percentage of students’ response was 86.70% (i.e. good category). In other words, the implementation of guided inquiry learning could make the lesson interesting, increase the motivation to learn, and increase students’ understanding about the reaction rate concepts. This research was in accordance with the study’s result conducted by Damayanti and Rusmini (2017) who argued that the average percentage of students’ respond towards the development of chemistry lab guide with guided inquiry oriented was satisfactory that was 93.44%.

CONCLUSION
1. Based on the research’s results, it can be concluded as follows:
2. 1. The students’ activities at the topic of reaction rate had the average percentages of 76.25% in meeting I, 84.13% in meeting II, and 83.33% in meeting III. It showed that overall the students activities were increased thus it said that the students more active in the learning process.
3. 2. The students’ performance in cognitive domain had the average percentage of 81.50%, in psychomotoric domain of 80.50%, and in affective domain of 81.00%.
4. 3. The average of students’ response was 86.70% (very good). This showed that the application of guided inquiry model affected the students to learn at the topic of reaction rate.
The Application of Guided Inquiry Model in the Topic of Reaction Rate to Increase Students’ Learning Outcome and Activities at Man Banda Aceh 1. (Habibati, Muhammad Nasir, Wahyuni)

REFERENCE


The Application of Guided Inquiry Model in the Topic of Reaction Rate to Increase Students’ Learning Outcome and Activities at Man Banda Aceh 1. (Habibati, Muhammad Nasir, Wahyuni)
