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TRAINING THE ANALYSIS SKILLS OF STUDENT THROUGH THE APPLICATION OF GUIDED INQUIRY LEARNING MODELS ON REACTION RATE MATERIALS

Fatimah Millenia Fauziah [1,2*], Dian Novita [2]
[1]State Senior High School 1 Kraksaan, Probolinggo, Indonesia
[1,2]State University of Surabaya, Surabaya, Indonesia
*Email: fatimahmilleniaf@gmail.com

Abstract

This research aims to describe the feasibility of learning models, student activities, learning outcomes, analytical skills, and students' responses by applying guided inquiry learning models. The research method used was one group pretest-posttest design. The results obtained were (1) the percentage of the quality of the implementation of learning for three consecutive meetings, namely 96.87%, 96.87%, and 93.75%. (2) Students' activities relevant to practicing analytical skills for three successive meetings are 88.67%, 90%, and 90.67%. (3) Student learning outcomes increased with the percentage of n-gain in the high category of 94.11%. (4) Each component of the students' analytical skills was, respectively, elemental analysis of 64.71% in the high category. In comparison, the analysis of relationships and organizational principles was 47.06% in the high category. (5) The students' responses were 92.70% and 91.92% for the learning model and the worksheet. Therefore, the implication of this research is based on the research results obtained, namely the guided inquiry learning model can be preferred to practice the analytical skills of students.

Keywords: *Analysis skills, guided inquiry, reaction rate*

Abstrak

Penelitian ini bertujuan untuk mendeskripsikan keterlaksanaan model pembelajaran, aktivitas peserta didik, hasil belajar, kemampuan analisis, dan respon peserta didik melalui penerapan model pembelajaran inkuiri terbimbing. Metode penelitian yang digunakan yaitu one group pretest posttest design. Hasil penelitian yang diperoleh yaitu (1) persentase kualitas keterlaksanaan pembelajaran selama tiga pertemuan berturut-urut yaitu 96,87%; 96,87%; dan 93,75%. (2) Aktivitas peserta didik yang relevan dengan kegiatan melatihkan kemampuan analisis selama tiga pertemuan secara berturut-turut sebesar 88,67%; 90%; dan 90,67%. (3) Hasil belajar peserta didik meningkat dengan persentase n-gain pada kategori tinggi sebesar 94.11%. (4) Hasil pada setiap komponen kemampuan analisis peserta didik yaitu berturut-turut yaitu analisis unsur 64,71% pada kategori tinggi, sedangkan komponen analisis hubungan dan prinsip-prinsip organisasi 47,06% pada kategori tinggi. (5) Hasil respon peserta didik yaitu untuk model pembelajaran dan lembar kerja yaitu 92,70% dan 91,92%. Implikasi penelitian ini berdasarkan hasil penelitian yang diperoleh yaitu model pembelajaran inkuiri terbimbing dengan demikian dapat menjadi dipilihan untuk melatihkan kemampuan analisis peserta didik.

Kata Kunci: Kemampuan analisis, inkuiri terbimbing, laju reaksi

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INTRODUCTION

Learning activities during the COVID-19 pandemic are carried out online learning to reduce interaction or social restrictions to prevent transmission of the COVID-19 disease. Online learning is carried out in an effort to stop mass gathering activities which have been recommended by the World Health Organization (WHO) (Auliya, 2020; Handarini & Wulandari, 2020; Mahardhani, 2020). This condition becomes a challenge to keep achieve the education goal. Education has the goal of forming a prominent personality by guiding and building intellectual and emotional skills (Sholichah, 2018). The government is making efforts to improve the quality of education by developing the 2013 Curriculum, which is mentioned in Permendikbud No. 36 of 2018 that learning activities are designed to perfect the mindset, namely strengthening active-seeking learning, focusing learning on students, and critical learning patterns. Analytical skills integrated into critical thinking skills are among the four primary skills that need to be mastered in the 21st century: critical thinking and problem solving, creativity and innovation, collaboration, and communication (Manurung, 2019; Ramdani et al, 2019; Redhana, 2019).

Chemistry subjects are subjects with multiple representation level concepts, namely abstract (sub-microscopic), macroscopic, and symbolic. Besides, chemistry subjects also contain qualitative and quantitative variables. They are included in subjects that are considered problematic by students because the concepts are related to one another to think critically and analyze (Hafsah et al, 2014; Karsli & Ayas, 2014; Mahfuzah et al, 2018; Zammiluni et al, 2018). As much 96.7% of students in class XI MIPA 7 of State Senior High School 1 Kraksaan Probolinggo also considered chemistry subjects difficult. Chemistry learning activities invite students to find concepts independently by asking students to do experiments. These activities make students carry out investigations, analyze, and conclude the experiments they have done (Arends, 2012). This activity requires students to have analytical skills to parse facts from information obtained from experiments, process and analyze data, and make conclusions from a series of experimental data. The sub-material of the factors that affect the reaction rate is one of the materials that require proof or experiment following the Basic Competence (KD) of the material to make it easier for students to understand the factors that affect the reaction rate.

Analytical skills are the basis for mastering higher abilities and must be mastered by students (Rahmadhani & Novita, 2018). According to Anderson & Krathwohl, analytical skills are categorized into three, namely elemental analysis, relationships, and organizing information (Gunawan & Palupi, 2012). Analytical skills can be trained by applying the guided inquiry learning model because this model involves students actively searching for knowledge or experience by giving assumptions, investigating, collecting data to prove allegations, and communicating the evidence obtained to friends and teachers. The guided inquiry model can be called a student-centered model or student center so that the role of the teacher is as a facilitator who guides students in every stage of inquiry (Azizah et al, 2016; Lahadisi, 2014). Thus, the guided inquiry learning model requires students to master the material and how they can use their potential and practice their abilities to solve problems. The application of guided inquiry learning models to practice analytical skills has been proven by several studies that have been conducted. Research conducted by Kota and Muchlis (2019) shows that the guided inquiry learning model can train students' analytical skills in the pre-test and post-test results of analysis skills as much as 96.8% of obtaining complete scores. Cahyani and Azizah (2019) also showed the results of increasing students' analytical skills after the guided inquiry learning model was applied in terms of the average N-gain value obtained of 0.73 with high criteria. (Cahyani & Azizah, 2019)

The pre-research results at State Senior High School 1 Kraksaan Probolinggo that had been carried out showed that the analysis ability of students on the sub-material factors that influenced the reaction rate was still low, which was in the category of elemental analysis ability, relationship analysis, and analysis of organizational principles. Respectively obtain a percentage of 21.11%, 39.26%, and 27.78%. This shows that it is necessary to conduct research that aims to

train students' analytical skills by applying guided inquiry learning models using learning tools that support research and learning on reaction rate material, which is limited only to the sub-material factors that affect the reaction rate.

RESEARCH METHOD

The type of research used in this study is the pre-experimental design using one group pretest-posttest design research. The sample of this research is 17 students of class XI MIPA 7 with a population all of XI MIPA students. This research was conducted at State Senior High School 1 Kraksaan Problinggo in the odd semester of the 2020/2021 school year.

The research design of one group pretest-posttest design used a randomly selected class. Students in the selected class will be treated in the form of a pretest (O_1), aiming to determine the students' initial abilities. The initial ability to be known is analysis ability and understand the sub-material factors that affect the reaction rate. After doing the pretest, students are then given treatment in the form of the application of guided inquiry learning models (X). The treatment is carried out to practice the analytical skills and understanding of students. Students are then given a posttest (O_2) to determine their final ability after being given treatment in the form of the application of the guided inquiry learning model. The research design is shown in Table 1 below:

Table 1. Desain Matching One Group Pretest-Posttest Design

Pretest	Treatment	Posttest
O_1	X	O_2

Information:

O_1 = pretest score (before treatmet)

O_2 = posttest score (after treatment)

X = treatment in the form of the implementation of guided inquiry learning

(Sugiyono, 2016)

This research's learning tools are the syllabus, the lesson plan (RPP), and the student worksheets. Learning devices are prepared in accordance with the learning conditions during the COVID-19 pandemic, namely online learning, and according to the guided inquiry learning model. This study's research instruments included study sheets and validation of learning devices, learning implementation observation sheets, student activity observation sheets, student response questionnaires, and pretest-posttest question sheets regarding analytical skills and reaction rate factors sub material.

The research procedure based on this research design is divided into three stages: preparation, implementation, and data analysis. The preparatory stage is carried out by compiling the learning tools and learning instruments needed in this study. The research tools and instruments that had been prepared were then carried out in the review and validation stages. The validation review stage is carried out to determine the feasibility of the research tools and instruments used at the research implementation stage. The research implementation stage was carried out according to the design of this study, namely giving a pretest before treatment, then the treatment in the form of the application of guided inquiry learning models, and finally the provision of post-test and student response questionnaires. During the research implementation stage, observations of the model implementation and student activities were carried out. The last stage is the analysis of the data obtained from the implementation stage through observation, tests, and questionnaires.

This study's data collection method is the observation method to observe the implementation of learning and student activities carried out by two observers of implementation and five observers of dominant student activities every 3 minutes during learning activities. The test method is to determine the learning outcomes and the level of students' analytical skills before and after the implementation of the guided inquiry learning model. The last one is the

questionnaire method to collect student response data to learning activities with guided inquiry models. Participants or data sources in this study were students of State Senior High School 1 Kraksaan Probolinggo in class XI MIPA 7.

Data analysis techniques adjust to the data to be analyzed. The data analyzed were data on implementing the learning model, student activity data, learning result test data, analysis skills test data, and student response questionnaire data.

a. Implementation of Guided Inquiry Learning Model

The learning model's feasibility data were obtained from the observations of learning at the data collection stage using the learning implementation observation sheet. The learning implementation refers to the lesson plan and is following the syntax of the learning model used. Observation of the implementation of the learning model aims to determine the quality of the learning implementation. The criteria for assessing the implementation of the learning model by scoring are in Table 2 below:

Table 2. Learning Model Implementation Scoring Interval

Score	Criteria
1	Implemented poorly
2	Executed well enough
3	Well executed
4	Executed very well

The score obtained is then analyzed using the formula below:

$$\%\ \text{syntax enforceability} = \frac{\text{the number of scores obtained}}{\text{maximum total score}} \times 100\% \quad (1)$$

The criteria then interpret the percentage of learning syntax implementation in Table 3:

Table 3. Interpretation of Percentage of Learning Implementation

Percentage	Criteria
0-20%	Very Poor
21-40%	Poor
41-60%	Good Enough
61-80%	Good
81-100%	Very Good

(Riduwan, 2015)

b. Students' Activity

Student activity data during learning activities were analyzed descriptively quantitatively. The activity data analyzed were obtained from the average results of observations by five observers by observing students' dominant activity every 3 minutes. The data is then analyzed by calculating the percentage of student activity using formula (2). The formula used is as follows:

$$\%\ \text{Student Activity} = \frac{\text{the number of frequency student activites that appear}}{\text{total student activity frequency}} \times 100\% \quad (2)$$

(Arifin, 2012)

Student activities are good and follow the learning model and skills being trained if the percentage of relevant students' activities is more significant than activities that are not relevant.

c. Pretest-Posttest Learning Outcomes and Analysis Ability

Students' initial ability in terms of knowledge and analytical skills can be seen from the pretest results before learning activities with guided inquiry models. Students' final ability, namely learning outcomes and increased analytical skills, can be seen from the post-test results that students have done. The value or completeness of the knowledge and abilities trained can be calculated using the formula (3) below:

$$\text{Grade} = \frac{\text{the number of scores obtained}}{\text{maximum total score}} \times 100 \quad (3)$$

Students can be complete if they exceed or equal the Minimum Completeness Criteria score determined by the school, which is 75. In addition to the completeness of students apart from individually, it can also be calculated classically using the formula (4) below:

$$\%\ \text{Classical Completeness} = \frac{\text{the number of students who completed}}{\text{the number of students}} \times 100\% \quad (4)$$

Classical completeness of learning outcomes and skills being trained is achieved if there are as many as ≥75% of students who become research participants more than the Minimum Completeness Criteria. Increased knowledge or learning outcomes and skills being trained can be calculated using the t-test and N-gain score of the pretest and posttest scores of each test. The first stage is the t test using the following conditions:

1) Research Hypothesis
   The research hypothesis for learning outcomes is that there is an increase in the pretest and posttest scores of learning outcomes after the application of the guided inquiry learning model. The research hypothesis for analytical skills was that there was an increase in the pretest and posttest scores of analytical skills after the implementation of the guided inquiry learning model.
2) Statistical Hypothesis
   H_0 : $\mu_1 \leq \mu_2$, There was an increase in the scores of the pretest and posttest learning outcomes/analytical skills after the implementation of the guided inquiry learning model.
   H_a : $\mu_1 > \mu_2$, There was no increase in the scores of the pretest and posttest learning outcomes/analytical skills after the application of the guided inquiry learning model.
   Information:
   μ_1 = pretest score of learning outcomes/analytical skills
   μ_2 = posttest score of learning outcomes/analytical skills
3) Testing Criteria
   Data were analyzed using right-hand paired sample t-test on the SPPS 23 application with a confidence level of 95% and a significant level (α) of 0.05. The following are guidelines for decision making:
   a) If $t_{count} < t_{table}$ then the null hypothesis (H_0) is accepted and the alternative hypothesis (H_a) is rejected.
   b) If $t_{count} > t_{table}$ then the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted.

The second stage is calculate the N-gain score using formula (5) by Hake is as follows:

$$\text{N} - \text{gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{maximum score} - \text{pretest score}} \quad (5)$$

The N-gain score category for improving learning outcomes can be seen in Table 4 below:

Table 4. N-gain Score Category

<g>	Category
$g \geq 0.7$	High
$0.7 > g \geq 0.3$	Medium
$g < 0.3$	Low

(Shofiana et al, 2015)

Students' knowledge and analytical skills can be said to have improved well if classically they had completeness of ≥75% and were in the criteria for t-test hypothesis of H_0 be accepted and N-gain score in the medium or high category.

d. Students' Response

Student response data obtained from students that filling out the questionnaire responses to learning activities that implementing and using student worksheet based on guided inquiry models. The data were analyzed descriptively quantitatively. Analysis of student response data is prepared based on the Guttman scale in the form of a statement. The Guttman scale criteria are in Table 5 below:

Table 5. Guttman Scale Criteria

Answer	Score
Yes	1
No	0

(Riduwan, 2015)

Student response data were analyzed by describing the percentage in each question. The calculation for each category uses the following formula (6):

$$\%\ \text{Student Response} = \frac{\text{the number of "yes" answer}}{\text{total of respondent}} \times 100\% \quad (6)$$

Learning activities are said get a positive response or results from students if the percentage obtained is ≥ 61% with good criteria, as shown in Table 3.

RESULT AND DISCUSSION

The result and discussion of research have been obtained during the implementation of research at State Senior High School 1 Kraksaan Probolinggo. The chemistry teacher randomly selected the class to be the subject of the study. In this study, only one class was used as a subject without any other class as a control. Data was collected in 3 meetings on different days, which is on 13, 20, and 27 October in class XI MIPA 7 with 17 students by online. The learning tools and research instruments used have gone through the analysis and validation stages by getting a validity percentage of 87.50% for the syllabus, 88.80% for lesson plans (RPP), 77.70% and 79.5% for student worksheet 1 and 2, 77.5% for the pretest-posttest sheet of learning outcomes and analysis skills, as well as 78% for the student response questionnaire sheet. The percentage of the validation data results is included in the valid category and is declared feasible for use in learning activities.

Implementation of Guided Inquiry Learning Model

The data on implementing the guided inquiry learning model were obtained from observations by two observers during three meetings. The observation sheet for implementing the learning model is adjusted to the stages of the learning model in the Learning Implementation Plan (RPP). The analysis of the learning model's implementation data aims to determine the quality of the learning activities carried out. The results of observing the implementation of the guided inquiry learning model for three meetings can be seen in Figure 1 below:

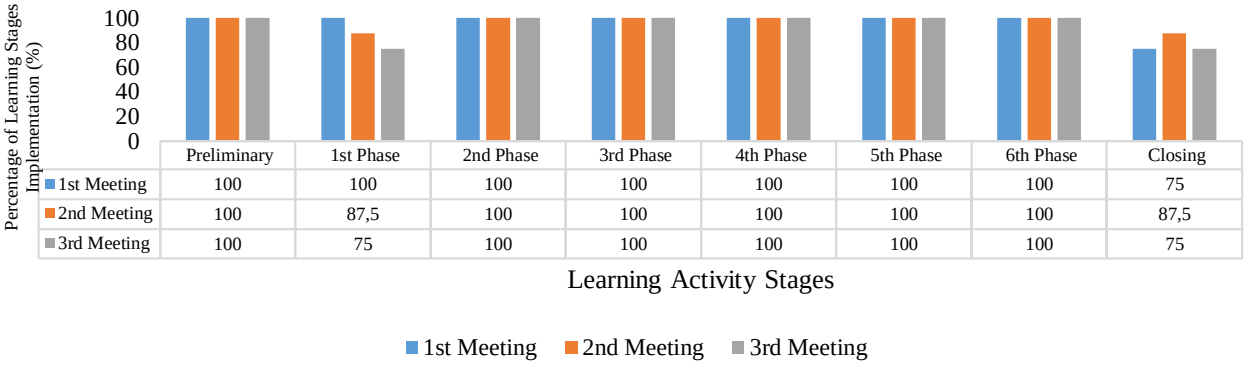

Figure 1. Percentage Graph of the Implementation of Guided Inquiry Learning Model

The quality of the learning model's implementation in Figure 1 above shows that each stage of the guided inquiry learning model is in good and very good criteria. Each meeting's average percentage was 96.87%, 96.87%, and 93.75%, with very good criteria. Interpretation of the percentage obtained refers to Table 3. The percentage of the implementation of learning using the guided inquiry learning model shows that the teacher masters and carries out learning activities very well and is consistent following the guided inquiry learning model's syntax as set out in the lesson plan. The syntax of the guided inquiry learning model has a relationship with the activity of practicing the analytical skills shown in Table 6.

Table 6. Relationship between Guided Inquiry Learning Model Syntax and Analytical Skills

Guided Inquiry Learning Model Stages	Students' Learning Activity	Trained analytical skills
Presents a phenomenon	Formulate problem	Elemental analysis
Formulate hypotheses about phenomena	Make a hypothesis	Relationship analysis
Collect experimental data	Determine the experimental variables and collecting data	Elemental analysis
Formulate explanations and conclusions	- Analyze data - Summing up the experimental results	- Relationship analysis - Analysis of organizational principles

(Kota & Muchlis, 2019)

The percentage of the implementation of the guided inquiry learning model based on Table 6 shows that the teacher has trained students' analytical skills very well during the online learning process because there is a relationship between each stage of learning and training analytical skills. In addition, according to the Piaget and Vygotsky's theory of learning, the teachers who can carry out learning properly and meaningfully have a good impact such as increasing the motivation of students in learning and being more focused when the teaching and learning process is carried out (Balqis et al, 2014; Muizaddin & Santoso, 2016). This is relevant to the results of the implementation of the guided inquiry learning model in research conducted by Novitasari and Muchlis (2020) that the quality of good learning implementation can improve student learning outcomes and analytical skills of students. (Novitasari & Muchlis, 2020)

Students' Activity

Student activity obtained during learning activities were observed by five observers at each meeting, with each group of 4-5 students being observed by an observer. Observers observe the dominant activity of students every three minutes for 90 minutes. Participant activities on the observation sheet can be observed online through discussions conducted by students with their

groups. Observation of student activities aims to determine whether the activities carried out by students are relevant to the learning model applied during learning activities. This observation also aims to find out whether students practice improving analytical skills during learning activities. Students' analytical skills are trained by using guided inquiry student worksheet. Activities are related to analytical skills such as making hypotheses and analyzing data from observations so that students can solve problems on the activity sheets used in learning activities (Kuswana, 2012; Masitoh et al, 2017). The recapitulation of the results of observing the activities of students during the three meetings is in the following Table 7:

Table 7. Recapitulation of Student Activity Observation Results

	Students' Activity	Percentage (%)		
		Meeting 1	**Meeting 2**	**Meeting 3**
1	Respond to teacher interactions on Google Classroom	9.33	11.33	8.67
2	Read the phenomenon in student worksheet	10	9.33	10
3	Formulate a problem, then write it down in Google Classroom to discuss **(Elemental Analysis)**	8	7.33	8
4	Propose a hypothesis, then write it down in Google Classroom to discuss **(Relationship Analysis)**	8.67	8.67	9.33
5	Determine the appropriate variable, then write it down in Google Classroom for discussion and collecting data **(Elemental Analysis)**	8.67	8	8
6	Analyze data **(Relationship Analysis)**	12	10	10
7	Working on evaluation questions **(Relationship Analysis and Elemental Analysis)**	6.67	6.67	8
8	Make a conclusions **(Analysis of Organizational Principles)**	7.33	10	9.33
9	Presenting the results of the experiment video observations on Google Classroom	5.33	8	8.67
10	Actively participate in online discussions at Google Classroom	10.67	8	10.67
	Percentage of relevant activity	**86.67**	**90**	**90.67**
11	Irrelevant activities such as not having discussions during learning activities	13.33	10	9.33
	Total	**100**	**100**	**100**

The percentage obtained in Table 7 is the result of data analysis from the overall time. The percentage of relevant student activities obtained at meetings 1, 2, and 3 was 88.67%, 90%, and 90.67%. All students are excited to be active in class because of interesting learning activities. An increase in student activity percentage from meetings 1 to 3 indicates that students are motivated to be more active when learning activities (Rahman & Limatahu, 2020). In addition, according to Bruner's discovery learning theory, students who are actively involved are better than students who are passive during learning activities because the activeness of students is one of the basic elements of the success of the learning process (Arends, 2012; Wibowo, 2016).

The results indicate the students practicing analytical skills because the activities carried out following the implemented learning model's syntax that is the guided inquiry model. The guided inquiry model syntax has a relationship with three components of analytical skills: elemental analysis, relationship analysis, and organizational principles (Gunawan & Palupi, 2012). Activities related to the analysis component are based on Table 7. The first is the elemental analysis component; namely, students identify the implied meaning of a problem. The activities carried out formulating problems, determining variables, collecting data, and working on evaluation questions at student worksheet. The relationship analysis component is that students connect the concepts to explain, so the activities are carried out to practice relationship analysis

when proposing hypotheses, analyzing data, and working on evaluation questions in student worksheet. While making conclusions can be components of organizational principles because students arrange theories and observations into a conclusion (Kota & Muchlis, 2019). Implementing and using student worksheet based on the guided inquiry model has practiced their analytical skills well. The percentage of student activity obtained indicates that the applied learning model has been appropriately implemented because the percentage of relevant activities is more significant than irrelevant activities. The data from the analysis of student activity is in also accordance with research conducted by Ramadhanti and Novita (2020) where students carry out more relevant activities compared to irrelevant activities during learning with the guided inquiry learning model. (Ramadhanti & Novita, 2020)

Completeness of Learning Outcomes

The completeness data of students' learning outcomes was obtained from the post-test scores after three times online meeting using guided inquiry learning models on the sub-material factors that affect the reaction rate. The post-test score is an indicator to determine the final ability of students after learning activities. Students are said to be complete if they score more than 75 following the school's Minimum Completeness Criteria, namely 75. The post-test questions given are in the form of description questions with a total of 9 items. The post-test result of students of class XI MIPA 7 State Senior High School 1 Kraksaan Probolinggo are in Table 8.

Table 8. Students' Post-test Scores

	Name	Posttest Scores	Minimum Completeness Criteria	Completeness
1	BIJ	100	75	Complete
2	CAD	89	75	Complete
3	DNACP	89	75	Complete
4	DALA	100	75	Complete
5	EWS	100	75	Complete
6	FAU	89	75	Complete
7	FK	89	75	Complete
8	FE	100	75	Complete
9	MTW	100	75	Complete
10	MP	84	75	Complete
11	NNA	98	75	Complete
12	NAH	89	75	Complete
13	RFR	89	75	Complete
14	RM	89	75	Complete
15	SDO	89	75	Complete
16	VCF	89	75	Complete
17	YRPA	100	75	Complete

Students' completeness on the post-test score showed 100% classical completeness. The classical completeness that has been achieved is very good because all students in class XI MIPA 7 scored beyond the Minimum Completeness Criteria. The pre-test and post-test results improvement can be seen from the results of calculations using the paired samples t-test and the n-gain score between the pretest and post-test scores. The result of right-hand paired sample t test calculation obtained t_{count} (-11.173) < t_{table} (1.745), so it can be concluded that H_0 is accepted ($H_0 : \mu_1 \leq \mu_2$), which means there is an increase in learning outcomes after the application of the guided inquiry learning model. The n-gain score calculation on the completeness of learning outcomes as much as 94.11% is in the high category.

The completeness and improvement in students' learning outcomes in class XI MIPA 7 is in accordance with the research conducted by Asni and Novita (2015) that the guided inquiry learning model can improve student learning outcomes shown by classical completeness of

learning outcomes by 94.87%. Research conducted by Qomaliyah, Sukib, and Loka (2016) also states that the guided inquiry learning model can improve learning outcomes, student activity, and student learning completeness compared to conventional learning methods. This is in accordance with Vygotsky's theory of learning, namely meaningful learning can make students understand what they are learning so can improve the learning outcomes (Sai, 2017, Asni & Novita, 2015; Qomaliyah et al, 2016).

Analytical Skills

Analytical skills is a skill to describe, detail, sort, or recognize a problem into parts that are more detailed, structured, and easy to understand (Amalia, 2016). Analytical skills are trained through implementing and using the guided inquiry learning model student worksheet for three meetings. Student worksheet as a tool for practicing analytical skills, contains activities and practice questions according to the analytical skills component. The students' initial analytical skills were obtained from the pre-test scores. The pre-test was carried out before giving treatment in the form of learning activities. The final analysis ability of students was obtained from the post-test scores carried out after the third meeting. The pre-test and post-test questions used to determine students' analytical skills were descriptive questions as many as six items. The form of essay questions is more significant for measuring analytical skills than the multiple-choice analogy test (Kao, 2014). Analytical skills question includes three components of analytical skills, namely elemental analysis, relationship analysis, and analysis of organizational principles (Gunawan & Palupi, 2012). The increase in students' analytical skills was calculated using the right-hand paired sample t-test and the N-Gain score from the pre-test and post-test scores that had been carried out. The results of the right-hand paired sample t-test of all the analysis component is H_0 accepted, which there was an increase in the scores of the pretest and posttest analytical skills after the implementation of the guided inquiry learning model. For the N-Gain score for each component of the analysis ability can be seen in Figure 2.

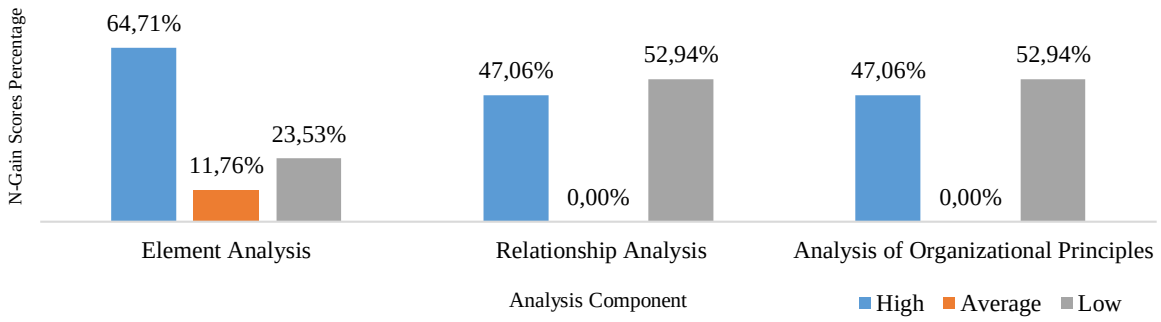

Figure 2. Graph of Percentage Category for N-Gain Score of Analysis Component

Elemental Analysis

The component of elemental analysis skills requires students to identify elements or implied meanings in a relationship or problem (Amalia, 2016; Kota & Muchlis, 2019). The elemental analysis component is measured by 2 item description questions in the form of questions about the phenomenon of factors that affect the reaction rate, namely surface area. In the component of elemental analysis skills, the average pretest score was 41.23 because students could not and were not accurate enough to answer questions related to the elemental analysis component. The results of students' pretest answers in the subject class can be seen in Figure 3.

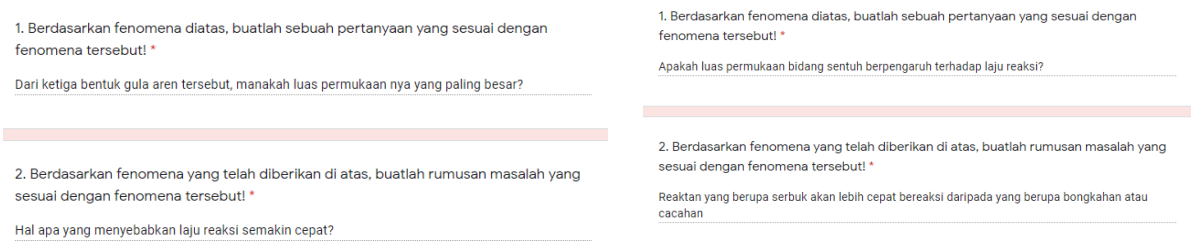

Figure 3. Students' Pretest Answer on Elemental Analysis

The pretest results in Figure 3 show that the students' answers do not match the question-answer grid. Question number 1 leads to an answer in the form of a question why the dissolving time of an object is different because the phenomenon that occurs is a difference in dissolving time with a different surface area of the object so that students' answers to number 1 are not correct. Question number 2 asks students to make a problem formulation so that the student's answer to number 2 is not correct because it is a statement, not a problem formulation.

The students' posttest results experienced an increase in the average post-test score compared to the average pretest score is 79.35. This increase is supported by students' activities in point number 3 in Table 7, who practice elemental analysis skills using the guided inquiry model student worksheet Students' post-test answers to this component are generally correct and precise. Students can make problem formulations from the phenomena presented. Students' post-test answers in the subject class can be seen in Figure 4 below:

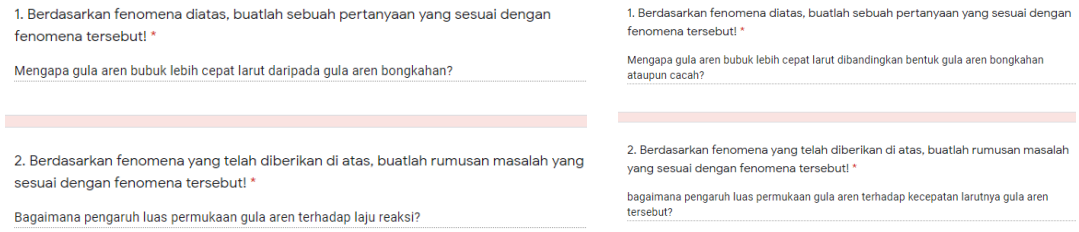

Figure 4. Students' Posttest Answer on Elemental Analysis

Students' post-test answers in Figure 4 written by students were better than the pretest's answers. The answer is shown in the correct answers to questions number 1 and 2 with the question-answer grid. The increase in students' elemental analysis skills is calculated based on the right-hand paired sample t-test and the N-gain value of each student's pretest and post-test results. The result of right-hand paired sample t-test obtained t_{count} (-5.373) < t_{table} (1.745), so it can be concluded that H_0 is accepted ($H_0 : \mu_1 \leq \mu_2$), which means there is an increase in analysis skills after the application of the guided inquiry learning model. For the N-gain score was that 64.71% of students experienced an increase in the high category, 11.76% in the medium category, and 23.52% in the low category. The percentage is interpreted based on the categories in Table 3. From the results of data analysis using the t test and n-gain scores, it can be concluded that the elemental analysis skills of students have increased.

Relationship Analysis

The component of relationship analysis skills requires students to connect and re-examine concepts' suitability to make an explanation (Amalia, 2016; Kota & Muchlis, 2019). The relationship analysis of students is measured by 3 item description questions in the form of questions about the relationship between factors that affect the rate of reaction and the reaction rate. The average pretest value in the relationship analysis component was 73.47 because students' answers were not correct with the question-answer grid. The results of students' pretest answers to the three items of the relationship analysis component are shown in Figure 5 below:

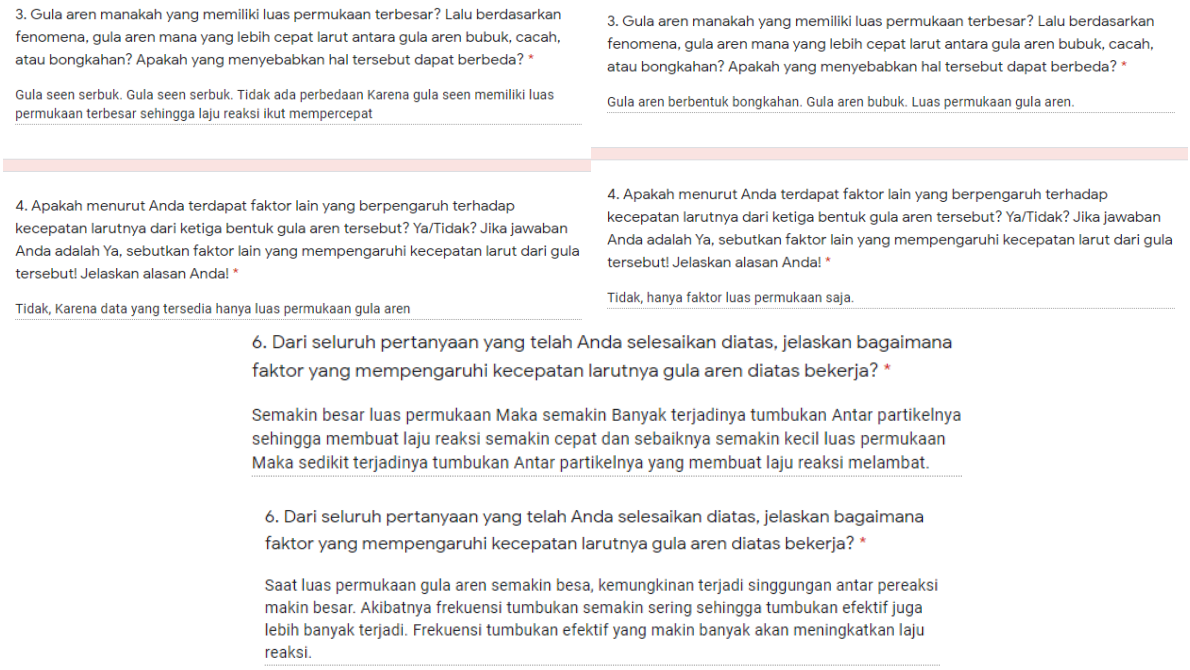

Figure 5. Students' Pretest Answer on Relationship Analysis

The results of the students 'pretest in Figure 5 show that the students' answers were insufficient and incorrect with the answer to the question grid at several points with other answers already getting the maximum score. Question number 3 in the third part asks the cause of the difference in the object's dissolution rate and the difference in surface area over which there should be the difference. Question number 2 asks students to analyze other relationships mentioned in the phenomenon. The results of the post-test students experienced an increase. It was known from the average value obtained, which was 82.52, which increased from the average pretest score. The activities supported this increase carried out by students at points 4, 6, and 7 in Table 7. Students' answers to the posttest were generally correct and correct. Students were able to analyze the relationships that occur in phenomena. Students' post-test answers to the relationship analysis component are shown in Figure 6.

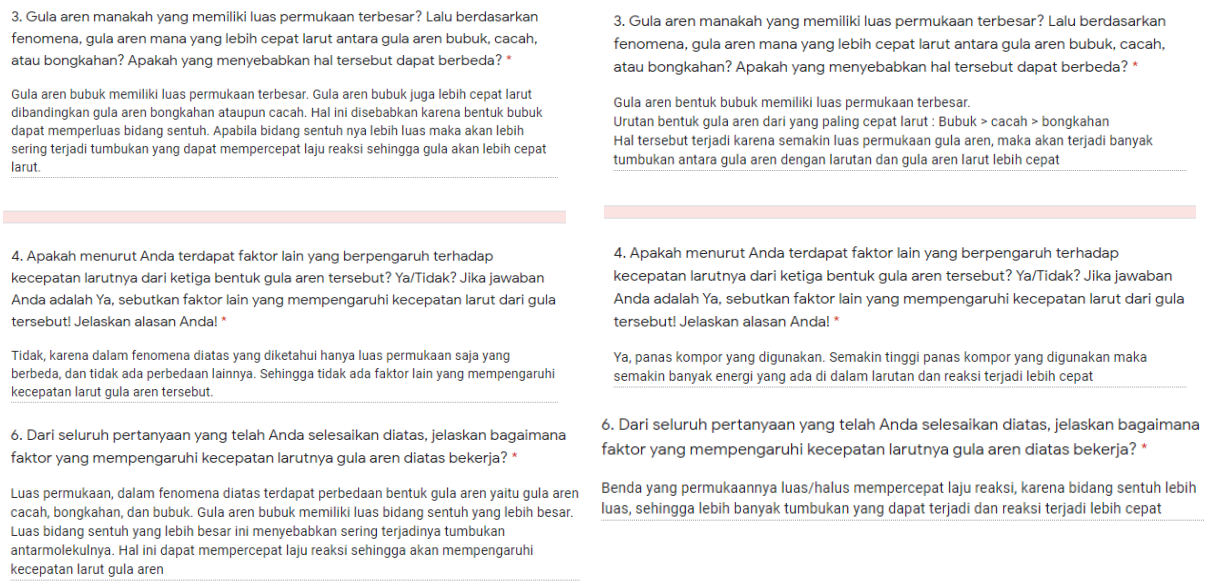

Figure 6. Students' Posttest Answer on Relationship Analysis

The answers written by students during the post-test were better than during the pretest. This can be seen from students' answers in numbers 3, 4, and 6 that are correct with the question-answer grid. The increase in relationship analysis ability was analyzed using the right-hand paired sample t-test and the N-gain score. The result of right-hand paired sample t-test obtained t_{count} (-1.912) < t_{table} (1.745), so it can be concluded that H_0 is accepted ($H_0 : \mu_1 \leq \mu_2$), which means there is an increase in analysis skills after the application of the guided inquiry learning model. The relationship analysis component results increased in the high category by 47.06% and in the low category by 52.94%. The percentage is interpreted based on the categories in Table 3. From the results of data analysis using the t-test and N-gain scores, it can be concluded that the relationship analysis skills of students have increased.

Analysis of Organizational Principles

The analysis component of organizational principles requires students to conclude from a problem and various opinions (Kota & Muchlis, 2019). The ability to analyze organizational principles is measured by 1 item in the description that asks students to write down conclusions from the results of the analysis carried out by students. The pretest results for the analysis of organizational principles got an average value of 49 because students were not precise in concluding. The results of students' pretest answers in the subject class on the organizational principles analysis component are shown in Figure 7 below:

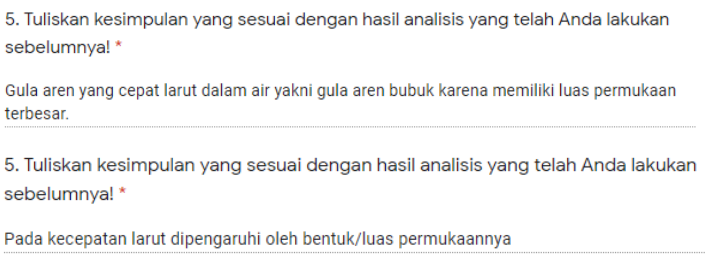

Figure 7. Students' Pretest Answer on Analysis of Organizational Principles

The pretest answers in Figure 7 show that the answers are not correct with the question-answer grid. Students' answers incomplete because some points have not been written down to conclude, so the students' answers are not correct. The students' post-test results increased in terms of the average post-test score obtained, which was 76.47. The increase in the average score in terms of students' activities in point number 8 trains analysis of organizational principles. The post-test answers of students in the subject class to this analysis component are shown in Figure 8 below:

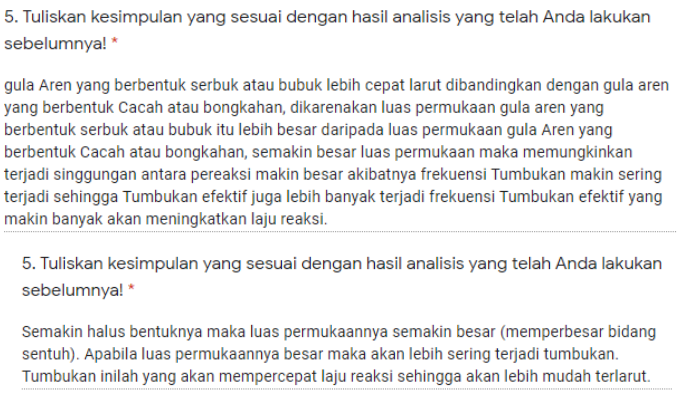

Figure 8. Students' Posttest Answer on Analysis of Organizational Principles

The students' post-test results in this analysis component were better than the answers at the pretest and were right with the question-answer grid. The analysis of organizational principles

enhancement analyzed using the right-hand paired sample t-test and the N-gain score obtained from the students' pretest and posttest scores. The result of right-hand paired sample t-test obtained t_{count} (-2.190) < t_{table} (1.745), so it can be concluded that H_0 is accepted ($H_0 : \mu_1 \leq \mu_2$), which means there is an increase in analysis skills after the application of the guided inquiry learning model. For the N-gain percentage obtained is the same as the relationship analysis ability component, which is 47.06%, and in the low category, it is 52.94%. The percentage is interpreted based on the categories in Table 3. From the results of data analysis using t-test and N-gain scores, it can be concluded that the analysis of organizational skills of students have increased.

The implementation and use of the guided inquiry learning model student worksheet can practice the analytical skills seen from the result of right-hand paired sample t-test that the hypothesis null (H_0) is accepted and from the interpretation of N-Gain score percentage results from the pre-test and post-test scores of students that have increased well. These results are in accordance with the results of research conducted by Kota and Muchlis (2019), namely that students' analytical skills increased and obtained the percentage of N-gain scores on the high, medium, and low criteria, respectively, of 80.7%, 16.1%, and 3.2%. The increase in analytical skills that occurs is also according to Piaget's theory of learning that inquiry learning maximally involves all students' thinking abilities to seek and investigate systematically, critically, logically, and other high level abilities such as analyze, evaluate, and synthesis so that these abilities can develop (Amijaya et al, 2018; Sukarmin et al, 2017).

Students' Response

Student response data to learning with a guided inquiry model carried out for three meetings to practice analytical skills on the sub-material factors that affect the reaction rate were obtained from questionnaire links containing several questions related to learning activities. The questionnaire link was given at the last online meeting via google classroom. Learning activities can be said to get positive results if the percentage obtained from filling out student response questionnaires is ≥61% (Riduwan, 2015). Student response questionnaires can be used as material for reflection by the teacher on learning activities. A recapitulation of the results of students' responses to the learning model and student worksheet applied are in Tables 9 and 10.

Table 9. Student Response Questionnaire Results to Guided Inquiry Learning Model

Statement	Percentage (%)	Criteria
1	100	Very good
2	100	Very good
3	100	Very good
4	62.34	Good
5	100	Very good
6	94.10	Very good
7	100	Very good
8	100	Very good
9	88.20	Very good
10	82.40	Very good
Average	**92.70**	**Very good**

The student response questionnaire results to this research learning activity got positive results indicated by the acquisition of an average percentage of each statement in the questionnaire as much as 92.70% of students gave a positive response as shown in Table 9. The use of student worksheet with the implemantation of the inquiry learning model's syntax also got positive results with the acquisition of an average percentage of 91.92% of each statement in the student response questionnaire, as shown in Table 10.

Table 10. Student Response Questionnaire Results to the Student Worksheet

Statement	Percentage (%)	Criteria
1	100	Very good
2	72.94	Very good
3	94.1	Very good
4	100	Very good
5	66.17	Good
6	94.10	Very good
7	100	Very good
8	100	Very good
9	100	Very good
Average	**91.92**	**Very good**

Students' responses to the applied learning model and the student worksheet used were in the very good category. Interpretation of the percentage of students' responses refers to Table 3. The positive response of students shows that the learning activities that have been carried out are considered increase interest in learning by students. The response of students in this study is appropriate with the results of students' response in the research conducted by Basuki and Novita (2019), which is getting a positive response with an average student response of 98.73% for the application and use of the student worksheet guided inquiry model. Therefore, the response of students to learning is very necessary, because if the interest of students in learning activities will motivate themselves to learn so that learning outcomes and thinking skills can increase (Komari, 2015). (Basuki & Novita, 2019).

CONCLUSION

The guided inquiry learning model's implementation can practice students' analytical skills in class XI MIPA 7 State Senior High School 1 Kraksaan Probolinggo which in this study is limited to the sub-material of the factors that affect the reaction rate. This is supported by the implementation of good learning and student activities as well as the learning outcomes and analytical skills of students before and after the implementation of the guided inquiry learning model has increased. The research implication based on the result of this research, the guided inquiry learning model can be the preferred learning model to practice students' analytical skills. The next research is suggested to add elemental analysis and analysis of organizational principles features to the student worksheets.

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