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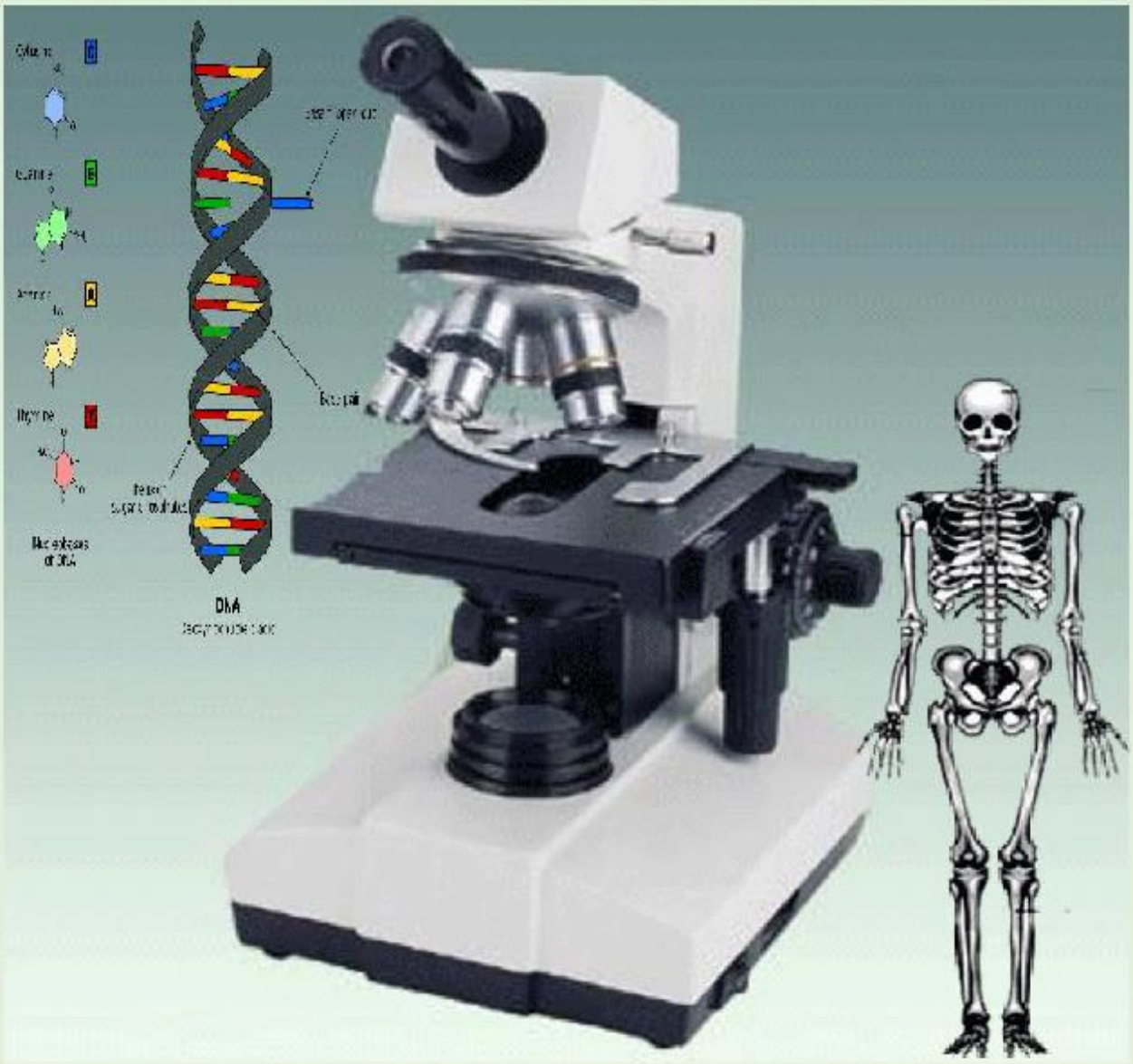

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Students' learning activities and science process skills: The effectiveness of group investigation learning model

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ABSTRACT

Science learning should prioritize the development of process skills rather than science products because these skills are needed in carrying out the scientific method. Science process skills can be achieved if students are actively involved in learning. One of the learning models that involve student activities is the Group Investigation (GI). The purpose of this study was to determine the effectiveness of the GI learning model in practicing students' learning activities and science process skills on additives material at grade VIII. This type of research is classroom action research covering two cycles. One cycle covers the stages of planning, implementing, observing, reflecting. The research subjects consisted of 30 students. The instruments were used in the form of student activity observation sheets and science process skill sheets. Data analysis was carried out descriptively qualitatively. According to this research results, students' learning activities in the cycle I was 73.3% ("active" category) and in the cycle II was 80.68% ("very active" category). Meanwhile, students' science process skills in the cycle I was 73.03% ("skilled" category) and in the cycle II was 82.36% ("very skilled" category). The conclusion is that the GI model is effective in training students' learning activities and science process skills.

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INTRODUCTION

Science learning focuses on delivering experiment directly to students so it can be more meaningful. The meaningful process put individual's experiment through the process of observing, asking, reasoning, trial and concluding to increase students' competencies on behavior, skill and

knowledge. Thus process is written in 2013 curriculum which is known as scientific approach (Suciati et al., 2018). The demand of 2013 curriculum which require students to be active in learning should be balanced with the achievements in many aspects such as students' knowledge, behavior and skills which exist in the learning activity. Students are required to be active in learning, not only as recipients of subject matter (Muchsin & Hamdi, 2021). Thus learning achievement is determined by its process, not only result (Abdjul et al., 2019).

Science process is the basic needed to work scientifically. Science process skills are basic skills that emphasize the learning process to empower students' skills in understanding knowledge or concepts to facilitate students learning science actively, developing responsibilities, and accommodating research methods (Gürses, Çetinkaya, Doğar, & Şahin, 2015). Science process skills are divided into two main categories, namely basic process skills and integrated process skills (Turiman, Omar, Daud, & Osman, 2012; Jeenthong, Ruenwongsa, & Sriwattanarothai, 2014; Aydogdu, 2015; Gürses et al., 2015). Basic science process skills include observing, measuring, classifying, predicting, communicating. Furthermore, integrated process skills include formulating and evaluating hypotheses, compiling data tabulations, identifying and controlling variables, designing experiments, conducting investigations, using time-space relationships, interpreting and comparing results and drawing.

According to Duran et al., (2011), science process skill need to be embedded, possessed and practiced by students because science process skills are basic in scientific inquiry and necessary in learning science concepts. In line with the statement, Ambarsari, Santosa, & Maridi, (2013) explained that when someone is familiar with science process skills, he will have the skills in solving a problem, doing analysis, knowing and will make a plan. Furthermore, according to Ergü, Şımşeklı, Çaliş, Özdılek, Göçmençelebı, & Şanli (2011), the empowerment of science process skills is needed by students to overcome problems, make decisions, think critically, find answers, help students to think logically, ask reasonable questions and find solutions to problems encountered in daily life.

Based on the students' questionnaire result of grade VIII in SMP Negeri 1 Ngoro Jombang, several problems arise. They were: (1) the lack of science learning implementation, learning models applied are less varied and more often teacher centered, (2) the students' enthusiasm of learning and the awareness of the learning is still at low level, (3) the level of scientific work is also low, moreover when student worked on practicum which was because they seldom practice on practicum so most of them are less skilled and cannot develop the practicum procedure well, (4) students assume that additive material is difficult because they difficult to differ the names of artificial chemicals used food products. The problems indicate that students have low learning activities and science process skills. Those are feared to have an unfavorable impact on student learning outcomes because the achievement of learning objectives is strongly influenced by the learning process.

Science process skills can be achieved if students are involved actively in each step of learning. The learning scenarios designed precisely by the teacher can resolve the problem of students' lack of science process skills appropriately. The learning scenario can be stated in the form of a learning model. One of the learning models that can be applied to overcome the problems is Group Investigation (GI). The GI learning model is a cooperative learning in which each group is free to choose subtopics from the whole unit of material (subject matter) to be taught, then each group produces a group report (Zingaro, 2008). Next, each group presents its report to the whole class to share and exchange information on their findings.

Rukmana (2018) said that a skill will be well trained when students are trained on how to do it directly rather than just giving theory. According to Barus & Sitompul (2016), the GI learning model is very suitable for practicum learning activities-based investigation that are

designed in study groups. It can empower students 'abilities in scientific thinking through discussion with group members and can develop students' science process skills. Another research from Handari, Prayitno, and Ariyanto (2012) explained that the GI model demands student activity during learning because students are directly involved through group investigations. Investigation activities based on the science process skills approach train students to find facts, concepts and theories that can instill students' scientific attitudes.

A research conducted by Solihah et al. (2016) proved an increase in students' science process skills by applying the GI model in biology learning. From the results of the study, it noted that the average posttest score of the experimental class applied by the GI model was higher (82.40) compared to the control class (74.83). In line research conducted by Handari et al. (2012) also provides results that the application of GI learning models can improve students' science process skills. The research results of Barus & Sitompul (2016) also show that the GI model influences the science process skills in biology learning. Furthermore, the findings of Siregar & Motlan (2016) show that the science process skills of students taught by the GI model are higher than the science process skills of students taught by direct learning. The research results of Wiratana, Sadia, & Suma (2013) also showed differences in process skills in students who were taught with the GI model with students who were taught using conventional learning.

According to the results of learning observations on April 16, 2019 in class VIIIH it is known that the lack of science learning implementation, learning models applied are less varied and more often teacher centered. The students' enthusiasm of learning and the awareness of the learning is still at low level (76.67% students). The results of interviews with science teachers show that the level of student scientific work is also low (80% students), moreover when student worked on practicum which was because they seldom practice on practicum so most of them are less skilled and cannot develop the practicum procedure well. Based on the students' questionnaire on April 23, 2019 in class VIIIH which consists of 30 students it is known that 66.67% students assume that additive material is difficult because they difficult to differ the names of artificial chemicals used food products. The problems show that students have low science process skills. Those are feared to have an unfavorable impact on student learning outcome because the achievement of learning objectives is strongly influenced by the learning process. The facts related to the low science process skills of these students affects the achievement of learning outcomes, where the achievement of student learning outcomes in science subjects is still in the low category based on data obtained from science teachers, where 46.67% of students have not reached the minimum completeness criteria.

Based on these problems, a study was conducted aimed to find out the effectiveness of Group Investigation learning model in practicing students' learning activities and science process skills. This study is different from other studies, where the GI model is applied to grade VIII in additives lesson of science learning. The science process skills studied include activities of measurement of food or beverage additives, classify artificial and natural additives, and conclude artificial and natural additives based on data. This research results are expected to provide benefits in science learning in the form of information about the GI model effectiveness in practicing students' learning activities and science process skills.

RESEARCH METHODS

Research Design

This type of research is a Classroom Action Research consisting of two cycles. One cycle includes planning, implementing, observing and reflecting stages. The purpose of this study was to determine the effectiveness of the Group Investigation (GI) model in practicing students' learning

activities and science process skills. The research conducted in July 2019 at SMP Negeri 1 Ngoro Jombang. This research is applied to the additive material lesson.

Population and Samples

This study took the population of grade VIII in SMP Negeri 1 Ngoro Jombang consisting of 9 classes with a total number of 270 students. They are from grade VIII A to grade VIII I. Each class consists of 29-31 students. The research sample used was students of grade VIII H as many as 30 students.

Instruments

The research instruments include observation sheets of student learning activities and science process skills. Empirical instrument validation was carried out by the lecturer of the Natural Science Education Study Program of Universitas Hasyim Asy'ari Jombang, namely Dr. Nur Kuswanti, M.Sc.St. Student activity observation sheets are used to find out student activities during learning with the GI model that is contained in the Lesson Plan. The indicators for assessing student activity during the learning are presented in Table 1.

Table 1. Indicators for assessing students' learning activities

Aspects of Students' Activities	Indicators
Identifying topic in groups	Students pay attention to the teacher's explanation for the implementation of identification activities
	Students read the LKS which will be used for identification according to the teacher's directions
	Students ask the teacher about the material to be studied
Planning the assignments	Students plan identification activities by identifying the composition on food or beverage packaging
	Students discuss identification activities in groups
	Students carry out identification with their groups with the guidance of the teacher
Doing investigation	Students ask when they have difficulty during identification activities
	Students read and record the composition of food or beverage ingredients on the packages that have been prepared on the Student Worksheet
	Students prepare a final report from the data collected during the identification process and collect the data obtained
Preparing final report	Students submit opinions in groups
	Students record the conclusions of the identification results that have been carried out on the Student Worksheet to be presented
	Students present the results of the discussion
Presenting final report	Students pay attention to the opinion of friends
	Students express opinions
	Students pay attention to the teacher's explanation of the material and identification that has been carried out
Evaluation	Students answer questions about identification activities
	Students complete assignments given by the teacher

The science process skills observation sheet is used to measure the science process skills of students during the implementation of learning model. The measurement of students' process skills refers to Kurniawati (2015) which includes observing, measuring, concluding, predicting, classifying and communicating. But in this study, the researcher limited to measuring, classifying and concluding aspects. Data on students' skills in measuring, classifying and concluding were obtained from the results of practicum which included cognitive and psycho-motor aspects as follows: (1) measuring food additives or drinks using Ohauss balance of 50 grams, (2) classifying the characteristics of natural and artificial additives, and (3) concluding natural and artificial additives based on the data provided. The science process skill indicators are described in Table 2.

Table 2. Science process skills indicators

No	Aspects of Science Process Skills	Indicators
I	Measure	1. Put the object / substance in its place (appropriate container) 2. Place the metal earrings (pendulum) in a suitable position for measuring 50 grams - starting arm at "5" - middle arm at "45" - forearm at "0" 3. Place the material to be weighed so that the arm on the Ohauss balance is in a balanced position (flat)
2	Classify	1. Identify the characteristics of food/beverage additives 2. Identifying additives 3. The suitability of the grouping of additives
3.	Conclude	1. Based on the data provided 2. Using clear statement sentences and according to Enhanced Spelling 3. According to the truth of the concept

Procedures

This research consists of cycles I and II. Cycle I begins with the planning stage, where this stage is a preparation stage to conduct an interview to a science teacher in grade VIII SMP Negeri 1 Ngoro Jombang. After that, the researcher analyzed the curriculum related to the additive material lesson based on the curriculum used by the school which is curriculum 2013. After carrying out curriculum analysis, the next activity is the preparation of learning tools. The learning tools used are Lesson Plan and Student Activity Worksheet. The next activity is the preparation of research instruments needed during the research. The next stage is implementing, namely the application of the investigation group learning model. During the implementation of GI model, observations were made on the implementation of learning in the classroom to measure students' activities and science process skills. The GI learning model was applied for two meetings. Observations were made by a science teacher at SMP Negeri 1 Ngoro and a lecturer in the science education study program at Universitas Hasyim Asy'ari Jombang. In this study, the researcher acts as a teacher.

Furthermore, a reflection on the learning activities that have been carried out. Reflection is used to improve learning activities in cycle I. After that, Cycle II is continued based on the results of learning reflections in cycle I. The learning stages in cycle II are the same as in cycle I, namely planning, implementing, observing and reflecting. At the planning stage, the preparation of learning tools and learning instruments is carried out. The next stage is implementing, namely the

application of the investigative group learning model to measure students' activities and science process skills. Next is the reflection stage of cycle II learning.

The final stage is data analysis of students' activities and science process skills. Data analysis was carried out descriptively by calculating student learning activities and students' science process skills in cycle I and cycle II. The analysis results are categorized based on the scoring criteria of learning activities and science process skills. The scores of students' learning activities and science process skills in cycle I and cycle II were then compared to find out if there was an increase. The application of the GI model is said to be effective if student's learning activities are included in the "active" category and students' process skills are in the "skilled" category.

Data Analysis

The following describes the results of the data analysis of students' activities and science process skills. Percentage category of students' learning activities are shown in the Table 3.

Table 3. Percentage category of students' learning activities

No	Percentage of Students' Learning Activities	Category
1	80 ≤ percentage ≤ 100	Very active
2	60 ≤ percentage < 80	Active
3	40 ≤ percentage < 60	Active enough
4	20 ≤ percentage < 40	Less Active
5	1 ≤ percentage < 20	Passive

(Modified from Affriani, 2016)

Then, the interpretation of the students' science process skills score (x) is explained in the Table 4.

Table 4. The category of students' science process skills score

No	Percentage of Students' Science Process Skills	Category
1	$0 \leq x < 20$	Very less skilled
2	$20 \leq x < 40$	Less skilled
3	$40 \leq x < 60$	Skilled enough
4	$60 \leq x < 80$	Skilled
5	$80 \leq x \leq 100$	Very skilled

(Modified from Affriani, 2016).

RESULT

Based on the results of the study, data was obtained on the implementation of learning in cycles I and II, each starting from the planning stage, then implementing, observing and finally reflecting. The data obtained in Cycles I and II are explained as follow.

Cycle I

Cycle I includes the stages of planning, implementing, observing and reflecting. Each stage carried out produces the following data.

Planning

Activities carried out at the planning stage are compiling learning tools and research instruments. Learning tools consist of lesson plans and student worksheets. The research

instrument is arranged in the form of observation sheets for students' learning activities and science process skills.

Implementing

At the implementing stage, a group investigation learning model. At this stage, students identify additives in packaged foods, then proceed with practicum to measure the weight of packaged foods using the Ohauss balance. This activity was held on July 18, 2019. In this activity 6 groups were formed with 5 members in each group.

Observing

At the observing stage, observations were made on learning activities. Observations were assisted by two observers who came from a science teacher at SMP Negeri 1 Ngoro and a science lecturer at Universitas Hasyim Asy'ari Jombang. Each student in the group takes turns paying attention to the composition of the additive contained in the food packaging provided by the teacher, then the students record their observations into the Student Worksheet. The results of the observations showed that students were very enthusiastic when choosing the topic of identification on packaged foods. Next, students do a practicum of measuring the weight of packaged food using the Ohauss balance.

In observing activities, the following data were obtained. 1) Most students have been able to measure food ingredients. 2) Students have been able to classify additives in packaged foods. 3) Students are still unable to read the data provided by the teacher so that the conclusions drawn by students are still not quite right.

Reflecting

After applying the group investigation learning model, the next step is to reflect on the learning. The results of reflection and evaluation are used to improve learning. In the cycle I, several problems were found as follows. 1) Students are not all actively involved when identifying food and beverage substances. 2) Some students seem to be joking and are more likely to have fun eating. 3) Some students seem less able to work with their groups.

Based on the problems that occurred, further improvements were made to the learning process as follows. 1) The teacher approaches students who are less active to be more involved in learning. 2) The teacher gives an explanation of the tasks that must be done by students so that students become more understanding. 3) The teacher takes an approach to condition students who are joking and not focused when learning.

Cycle II

Cycle II consists of planning, implementing, observing and reflecting stages. Learning in cycle II is the result of reflection from cycle I.

Planning

Basically, the planning stage in the cycle II is the same as in the cycle I. The steps taken at the planning stage are preparing learning tools and research instruments.

Implementing

At the implementing stage, the group investigation learning model. At this stage, students identify additives in packaged beverages, then proceed with practicum to measure the weight of packaged beverages using the Ohauss balance. This activity was carried out on July 19, 2019.

Observing

At the observing stage, observations were made on learning activities. Each student in the group takes turns paying attention to the composition of the Additives contained in the beverage packaging, then students record their observations into the Student Worksheet. The results of observations showed that students were very enthusiastic about identifying the composition of ingredients in packaged drinks. Next, students carry out a practicum in measuring the weight of

packaged drinks using the Ohauss balance. The data obtained from observing activities are described as follows. 1) Students have been able to measure the weight of packaged drinks. 2) Students have been able to classify additives in packaged drinks. 3) Most students have been able to read the data provided by the teacher and draw conclusions correctly.

Reflecting

Based on the results of learning reflection in cycle II, the following data were obtained. 1) Students have been able to identify additives and draw conclusions. 2) All students have been actively involved in learning. 3) Students are more focused on each step of learning. 4) Students are more skilled at using the Ohaus balance. 5) Students look enthusiastic in carrying out identification activities and practicum measuring the weight of packaged drinks.

1. The Data of Students' Learning Activities

During the learning process, the students' activities are observed and assessed. The observation is observed by an observer by following the learning activity from the beginning until the end. Then, it was analyzed to find out and describe the students' activities during the learning process. The data result of that activity could be seen in the Table 5.

Table 5. Students' learning activities data

	Aspects of Students' Activities	% Students' Activities			
		Cycle I	Category	Cycle II	Category
A.	Identifying topic in groups	84.4	Very active	86.6	Very active
B.	Planning the assignments	63.3	Active	66.6	Active
C.	Doing investigation	66.6	Active	76.6	Active
D.	Preparing final report	62.2	Active	71.1	Active
E.	Presenting final report	91.1	Very active	94.4	Very active
F.	Evaluation	72.2	Active	86.6	Very active
	Average	73.3	Active	80.68	Very active

Based on Table 5, it is known that the average percentage of student activity in the cycle I is 73.3% with the "active" category while in cycle II is 80.68% with the "very active" category. The "evaluation" aspect achieved the best increase, namely 72.2% in the cycle I with the "active" category while in cycle II it was 86.6% with the "very active" category.

2. The Data of Students' Science Process Skills

The assignment of students' science process skill is measured by observing the skill of each student which covers 3 aspects. Those are measuring, classifying and concluding. In the stage of doing investigation, students conduct the practicum of food and beverage additive measurements in the classroom. Students determine the tools and materials to be measured, then students weigh the weight of ingredients containing additives by using an Ohauss balance of 50 grams. In this activity, students are trained to use practical tools and materials so that their science process skills are trained in the aspect of measuring. Next, students collect data about the characteristics of natural and artificial additives. In this activity, students are trained in science process skills in the aspect of classifying. From practicum activities, students collect data, analyze data and draw conclusions from the results of investigations conducted. Students concluded natural and artificial additive based on available data. In short, students are trained in their science process skills in the aspect of conclusions. After the teacher get the data, the analysis then is performed to describe the completeness of science process skill from the class. The data analysis can be seen in the Table 6.

Table 6. The percentage of students' science process skills (%)

Aspects of Science Process Skills	% Students' Science Process Skills			
	Cycle I	Category	Cycle II	Category
Measure	82.5	Very skilled	86.5	Very skilled
Classify	79.1	Skilled	85.5	Very skilled
Conclude	57.5	Skilled enough	76.1	Skilled
Average	73.03	Skilled	82.36	Very skilled

Based on Table 6, it can be seen that the average percentage of students' science process skills in the cycle I reached 73.03% in the "skilled" category and increased in the cycle II to 82.36% in the "very skilled" category. The increase in the category of science process skills occurred in the "classify" aspect of 79.1% with the "skilled" category in the cycle I to 85.5% in the cycle II with the "very skilled" category. In addition, it also occurred in the "conclude" aspect, which was 57.5% in the "skilled enough" category to 76.5% in the "skilled" category.

Figure 1. Students are measuring food ingredients

Figure 2. Classifying and concluding activities

DISCUSSION

In this study, the indicator used to know the effectiveness learning of GI model are based on some aspects, they are students' learning activities and students' science process skills. The first indicator is students' learning activities, it is a crucial aspect in learning. Student activities in the

learning process will determine success education (Diana, 2019). Riyanti (2012) explained through her research that to increase the learning outcomes, student must be active in the learning process. By involving themselves into the learning process actively, the student get experience directly.

On GI learning model, students are asked to discuss in groups, do investigation, prepare investigation and present the investigation result. Activities in the GI model allow students to explore their abilities. In group discussion, students exchange ideas with their group members, analyze the arguments presented by group members, respond to the arguments, give questions, evaluate arguments, submit criticism and positive suggestion that can empower students to be active in learning. When conducting an investigation, students are trained to work together in identifying various topics to be studied and gather information from various sources related to the topic. Next, students together with group members prepare the results of the investigation to be presented in the form of reports.

Siregar & Motlan (2016) through their research, explained that activity in the GI learning train students in collaborating and interacting with heterogeneous group members. Besides, students are also invited to involve in learning actively. In learning, students not only work together but also exchange ideas in groups. The formation of groups also functions as a social tool so that every students is involved in the learning process maximally. Student activities in learning must always be pursued. Students must be involved directly in the learning process so that learning become meaningful. The increase of students' learning activity can be pursued through the application of learning models that invite students to be active such as guided discovery learning model (N. Hayati & Berlianti, 2016), problem posing learning model (Agustin et al., 2017), inside outside circle learning model (Saroyo et al., 2016), make a match learning model (Tarigan, 2014), two stay two stray learning model (Affriani, 2016), team assisted individualization learning model (Riyanti, 2012).

After doing the observation of students' learning activities, the students' science process skill would be observed. Kurniawati (2015) stated that the basic process skill include observation, measurement, inference, forecasting, classifying and communicating. All of these skills are needed when students record the scientific problems. Some aspects of empowering process skills are: (1) providing opportunities for student to conduct exploratory activities, (2) giving student the opportunity to discuss, (3) helping student to generate ideas through the process which train skills specifically in the aspects of observation and measurement. Widiyawati & Sari (2019) stated that the empowerment of students' science process skills can be done through activities in the laboratory. Learning in the laboratory can help students to master the material through direct learning experiences.

The GI learning model in this study consists of some effective stages in training students' science process skills. Through the GI learning model, students are able to find facts, concepts and theories with their process skills and scientific attitude. This is because the GI model provides opportunities for students to be involved directly in the scientific activities through investigations (Handari et al., 2012).

Based on this research result, the percentage obtained at "conclude" aspect was the smallest which is 57.5% in cycle I which categorized as skilled enough and 76.1% in cycle II which categorized as skilled. Related to this data, it is explained that concluding activities are included in integrated science process skills (Turiman et al., 2012; Jeenthong et al., 2014; Aydogdu, 2015; Gürses et al., 2015), so that training students' process skills in the aspects of communicating, concluding and predicting is not easy but requires a process (Wiratana et al., 2013).

With the steps of the GI learning model, students will be trained in their process skills so that the scientific attitudes will develop in students. Widiyawati & Sari (2019) explained that the lack of science process skills could be due to the culture of conducting experiments that are still

low and not yet accustomed to being independent in practicing in terms of various interdisciplinary science.

The importance of process skills for students was also conveyed by Wiratana et al. (2013), by having a good sains process skills, it is expected that the learning outcomes achieved will be good. Learning success is influenced by understanding the concepts (products of science) as well as scientific work (science process skills). In the fact, a lot of students only memorize the concept but do not understand the concept itself. Science process skills are used by students in understanding material that is long term memory and improving scientific thinking skills (Abungu et al., 2014; Gillies & Nichols, 2014).

Science process skills are able to instill scientific habits in students, not just mastering the subject matter (Abdullah et al., 2015; Hodosyova et al., 2015; Subali et al., 2016; Hardianti & Kuswanto, 2017; Irwanto et al., 2017; Pratono et al., 2018). In line with the statements, Darmayanti, Sadia, & Sudiatmika (2013) said that the process of learning science emphasize on the aspects of science as a process and product. The products of science that are constructed from the scientific attitude and process of science will bring up new scientific products. On way to apply scientific process is through scientific work, scientific work is the implementation of students' process skills. Furthermore, students who are accustomed to doing science process skills will get high learning outcomes (Syafriyansyah et al., 2013; Nirwana et al., 2014). The findings of Ilma, Al-Muhdhar, Rohman, & Saptasari (2020) prove that science process skills are significantly related to students' cognitive abilities.

According to Andini, Hidayat, & Fadillah (2018); Ilma et al. (2020), science process skills can be trained in the learning process. The empowerment of students' science process skill can be done by applying many kinds of learning model such as: problem based learning, project-based learning, discovery learning (Andini, Hidayat, & Fadillah, 2018; Hayati et al., 2019), collaborative teamwork learning (Darmayanti et al., 2013), guided inquiry learning (Ergül et al., 2011; Ambarsari et al., 2013; Yuniastuti, 2013; Hanib et al., 2017; Muchsin & Hamdi, 2021), learning cycle (Kurniawati, 2015), outdoor learning (Wahyuni et al., 2017).

CONCLUSION

The research showed that *Group Investigation* (GI) learning model was effective in practicing the students' learning activities and science process skills. The average percentage of student activity in the cycle I is 73.3% with the "active" category and increased to 80.68% with the "very active" category in the cycle II. The average percentage of students' science process skills in the cycle I reached 73.03% in the "skilled" category and increased to 82.36% in the "very skilled" category in the cycle II. The results of this study are expected to be an alternative learning model that can be applied in schools because it is proven to be effective in training students' activities during learning and students' science process skills. This research is still limited to measuring science process skills in terms of measuring, classifying and concluding, so it is expected that further research on indicators of overall process skills to develop students' science process skills is due considering the importance of process skills in science learning.

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Example of student science process skill observation sheet

No	Aspects of Science Process Skills	Indicators	Science Process Skills Score					Notes
			Student I	Student II	Student III	Student IV	Student V	
I	Measure	I. Put the object / substance in its place (appropriate container) 2. Place the metal earrings (pendulum) in a suitable position for measuring 50 grams - starting arm at "5" - middle arm at "45" - forearm at "0" 3. Place the material to be weighed so that the arm on the Ohauss balance is in a balanced position (flat)						
2	Classify	I. Identify the characteristics of food/beverage additives 2. Identifying additives 3. The suitability of the grouping of additives						
3.	Conclude	I. Based on the data provided						

No	Aspects of Science Process Skills	Indicators	Science Process Skills Score					Notes
			Student I	Student II	Student III	Student IV	Student V	
		2. Using clear statement sentences and according to Enhanced Spelling 3. According to the truth of the concept						

Notes:
Score 3 , if there are 3 aspects achieved
Score 2 , if there are 2 aspects achieved
Score 1 , if 1 aspect is achieved
Score 0 , if no aspects is achieved