Effectiveness of Interactive Learning and Discovery Learning Models on Student Learning Outcomes and Activities in Environmental Change

Silpian Mohamad, Abubakar Sidik Katili & Dewi Wahyuni Kyai Baderan

Department of Biology, Gorontalo State University, Indonesia.

Abstract: This study aims to determine the differences in student learning activities and outcomes in environmental change materials using interactive learning and discovery learning models. The research method used was a quasi-experimental research with a pretest posttest non-equivalent control group design. Retrieval of data using cluster random sampling method. The total sample of 64 students came from class X IPA 3 which applied the interactive learning model and class X IPA 4 which applied the discovery learning model. The results showed that there were differences in student learning activities in the two classes. Information was obtained in the interactive learning class that the learning activity criteria were very good in all aspects observed, while in the discovery learning class there was one aspect that had very good criteria and five other aspects had good criteria. Based on the results of the analysis N-Gain shows that there are differences in student learning outcomes for the two classes observed. In the interactive learning class the N-Gain value reaches 0.70 (high category) in the discovery learning class reaches 0.46 (medium category).

Keywords: interactive learning, discovery learning, learning activities, and learning outcomes.

***Abstrak:** Penelitian ini bertujuan mengetahui perbedaan aktivitas dan hasil belajar siswa pada materi perubahan lingkungan menggunakan model interactive learning dan discovery learning. Metode penelitian yang digunakan yaitu quasi experimental researach dengan desain penelitian pretest posttest Nonequivalent Control Group Design. Pengambilan data menggunakan metode cluster random sampling. Jumlah sampel 64 siswa berasal dari kelas X IPA 3 yang diterapkan model interactive learning dan kelas X IPA 4 yang diterapkan model discovery learning. Hasil penelitian menunjukkan adanya perbedaan aktivitas belajar siswa pada kedua kelas, diperoleh informasi pada kelas interactive learning kriteria aktivitas belajar sangat baik pada semua aspek yang diaamati sedangkan kelas discovery learning terdapat satu aspek yang memiliki kriteria sangat baik dan lima aspek lainnya memiliki kriteria baik Berdasarkan hasil analisis N-Gain menunjukkan hasil belajar siswa terdapat perbedaan untuk kedua kelas yang di amati. Pada kelas interactive learning, nilai N-Gain mencapai 0,70 (kategori tinggi) pada kelas discovery learning mencapai 0,46 (kategori sedang).*

Kata kunci: *interactive learning, discovery learning, aktivitas belajar, dan hasil belajar.*

▪ **INTRODUCTION**

Learning is the link between process and outcome. If the learning process runs effectively, it will also have an effective impact on student learning outcomes. According to Nasution (2017) learning outcomes are one of the objectives of the learning process at school, therefore teachers must master a number of learning methods. In upgrading student learning outcomes, teachers should use the learning methods and models needed in educating and teaching their students when learning activities in class. According to Tayeb (2017), understanding the nature and conceptual strategies of the material being taught will have an impact on students' conceptual

flexibility abilities and language skills which greatly support students in understanding and mastering the material being taught. Through the process of learning activity and student creativity can be developed. The learning process involves physical activity and thinking especially for students. Selection of the model used in learning needs to be done in order to achieve goals. Another goal is to help students understand teaching material while at the same time fostering students' independent attitudes in learning. In achieving this, the role of the teacher is needed.

The teacher is the most important role in learning activities, in this context the teacher can create an interactive learning environment including interactions from teachers and students as well as between students, interactions between students and students and interactions with learning resources that facilitate the achievement of learning objectives. According to Ananda (2019) learning objectives are directions that must be achieved so that planning, like the learning process, can be well structured and determined. As already stated that in learning activities there is a process of interaction and this determines the achievement of learning objectives. Another thing that contributes greatly to the implementation of learning activities is the characteristics of the subjects. In this study the subjects that became the focus of biology studies.

Biology is the study of living organisms and their environment from the perspective of problem-solving and organizational levels. This is reinforced by Sudarisman (2015) biological material is not only related to scientific facts about natural events, but also with abstract entities and objects such as metabolic processes, hormonal systems, and coordination systems, among others. Biology education is focused on conceptual understanding and active participation. Interactions between lecturers and students, interactions between other students, and interactions with the environment characterize the biology learning process. Biology learning methods should give priority to providing direct experience to students so they can explore and understand their natural environment, which in turn will give them the possibility to find their own way and understand the principles of the topic being studied. If students have found and mastered subject ideas, this can have a positive impact on student learning outcomes and learning activities.

Student learning activities are activities carried out by students during learning activities. According to Siregar & Simatupang (2020) a series of activities carried out for students in teaching and learning activities are called learning activities. According to Saraswati & Djazari (2018) learning activity is an activity carried out by students in order to gain new things or knowledge. Where something that is not known at first becomes known through learning activities. This is necessary for students to play a role in the learning process in order to be active. This is reinforced by Wahyuningsih (2020) that student participation in the learning process is their effort to achieve learning experiences. The learning process is a procedure that can determine and answer questions about where the process will be directed, what will be aimed at, how to implement it, and how to determine the effectiveness of the process. Teachers are required to be able to take advantage of various kinds of activities that may be carried out in the learning process so that it is easy to convey material to students so that students also easily understand the material presented. If learning activities increase, this will affect student learning outcomes.

Learning outcomes play an important role in the teaching and learning process. Assessment of learning outcomes can inform teachers about student progress in following the learning process in an effort to achieve learning goals. According to Nugraha et al., (2020) learning outcomes are skills that students acquire after facing learning activities. In simple terms, student learning outcomes refer to the skills students acquire after completing learning activities. This is reinforced by Aulia & Sontani (2018), learning outcomes are the output values obtained after obtaining the material taught by tests or exams given by the teacher. Optimal learning outcomes can be seen from the completeness of student learning, the skills of students doing assignments, and good student appreciation of the lesson. Optimal learning outcomes are the acquisition of optimal learning processes. Both can be achieved if the teacher is able to apply the right learning model. Therefore, teachers are required to be able to apply appropriate learning models and be responsible in making students achieve good learning outcomes. However, in reality not every student can achieve maximum learning outcomes as expected by teachers in general.

One of the factors causing low student learning outcomes is the lack of interaction between students and teachers. Teachers who focus more on delivering material and do not involve students during the learning process take place, making it difficult for students to develop their ideas and knowledge. Teachers who rarely come in and only give assignments in the form of summaries to students. This makes learning less interesting, boring and students are not impressed with the ongoing learning so it is difficult for students to recall the subject matter that has been taught before. Other factors can also be seen from students, namely, students do not pay attention when the teacher explains so that the low ability of students to understand the material explained by the teacher. One of the factors that influence learning outcomes is the attention of students to the material being taught. Students should have attention to the material to be studied, because if students do not have attention to the material being taught, the result will be boredom, so that students become lazy to study. This was reinforced by Wirejati (2019) that students paid little attention to the explanations given by the teacher, students did not ask questions or answer questions given by the teacher. In schools, the learning model used is the discovery learning model. According to Mukaramah et al., (2020) the discovery learning model is not suitable if it is applied to a large number of students and only a few students seem active because students will only rely on one person to convey the results of discussions or those who provide responses, while students who others will become passive and become uninterested in what is being discussed.

In accordance with the problems above, the researcher suspects that one of the factors that needs to be studied more deeply is the application of the learning model. The learning model is a conceptual framework that can contain systematic procedures for managing learning experiences to achieve learning goals. The learning model also functions as a means of communication between teachers and students, students and students to achieve the learning objectives of Murdiana (2014). The learning model referred to by the researcher is a learning model that emphasizes student participation in learning activities and is able to invite students to be more active in the learning process, namely the interactive learning model. The interactive learning model is a learning model that involves the active role of students in learning because there are activities of

interaction and cooperation between students in discovering and understanding the concept of subject matter. According to Widiantono & Harjono (2017), interactive learning model is a learning technique that refers to the view of constructivism. This type of interactive learning encourages student inquiry and is easy to understand as learning that focuses on dialogue between students, students, and instructors with direct contact with learning materials. This is reinforced by the opinion of Alfianti et al., (2019) that the interactive learning model is effective when applied to learning because there is interaction between teachers and students, interaction between students and students, and interaction between students and learning resources, thus enabling students to build knowledge. themselves. The interactive learning model is considered to be effectively applied in learning activities, especially in Biology lessons for environmental change material. This study aims to determine differences in student learning activities and outcomes in environmental change material using interactive learning and discovery learning.

▪ **METHOD**
Participants

The population in this study uses two classes, namely class X IPA 3 which uses interactive learning model and class X IPA 4 using the discovery learning model with the number of students in each class of 32 students. Sampling was chosen using cluster random sampling.

Research Design and Procedures

The research design used is pretest posttest Nonequivalent Control Group Design i.e. a design that delivers pretest before treatment, as well as posttest after treatment for each group.

Before data collection was carried out, a test was carried out on the instrument questions which were distributed in classes that were not subject to action with a total sample of 25 people. The validity and reliability values are 0.396 and 0.856. After that a lottery was carried out for determining the sample, where there were two classes that would be treated as the experimental class and the control class. The selected sample is class X IPA 3 as the experimental class (applied interactive learning model) and class X IPA 4 as control class (applied discovery learning model).

The first level of both classes is given pretest to test students' basic knowledge before applying the interactive learning model and discovery learning models. Second, the learning process is carried out based on a learning model that will be used within a period of 4 sessions in the experimental class and control class with environmental change material. Third, student learning activities are seen based on the syntax of the model used. Fourth, both classes received a posttest to assess students' understanding of the material being taught after the treatment.

Instrument

The instrument used in this study was the observation sheet of learning activities to see the differences in student learning activities from both classes and pretest and posttest questions to see the difference in student learning outcomes of the two classes. The questions given are about environmental change. This student learning activity observation sheet serves to determine student learning activities during the learning

process that uses interactive learning models and discovery learning models on environmental change material. This observation sheet consists of several points that describe the activities of the students

The learning outcomes test sheet used in this study is in the form of essay questions to obtain data regarding the results pretest and posttest given in class X Science 3 and class X Science 4. Before the learning outcomes instrument is distributed, it will first be tested for validity and reliability, analysis of differentiating power and analysis of the level of difficulty of the questions.

Data Analysis

The data obtained were analyzed using data analysis techniques which included descriptive analysis, prerequisite analysis and hypothesis testing. Descriptive statistical analysis is used to describe student learning activities. Prerequisite analysis in the form of normality and homogeneity tests to find out the data is normally distributed and has a homogeneous variance. Hypothesis testing is in the form of t-test and N-Gain test.

▪ **RESULT AND DISSCUSSION**

The results of observations of student learning activities show that there are differences in student learning activities that are applied to interactive learning and discovery learning models. As for student learning outcomes, there are differences from the two classes that use the interactive learning model and the discovery learning model. Data on the learning activities of class X IPA 3 students using the interactive learning model obtained from the observation sheet of student learning activities can be seen in Figure 1.
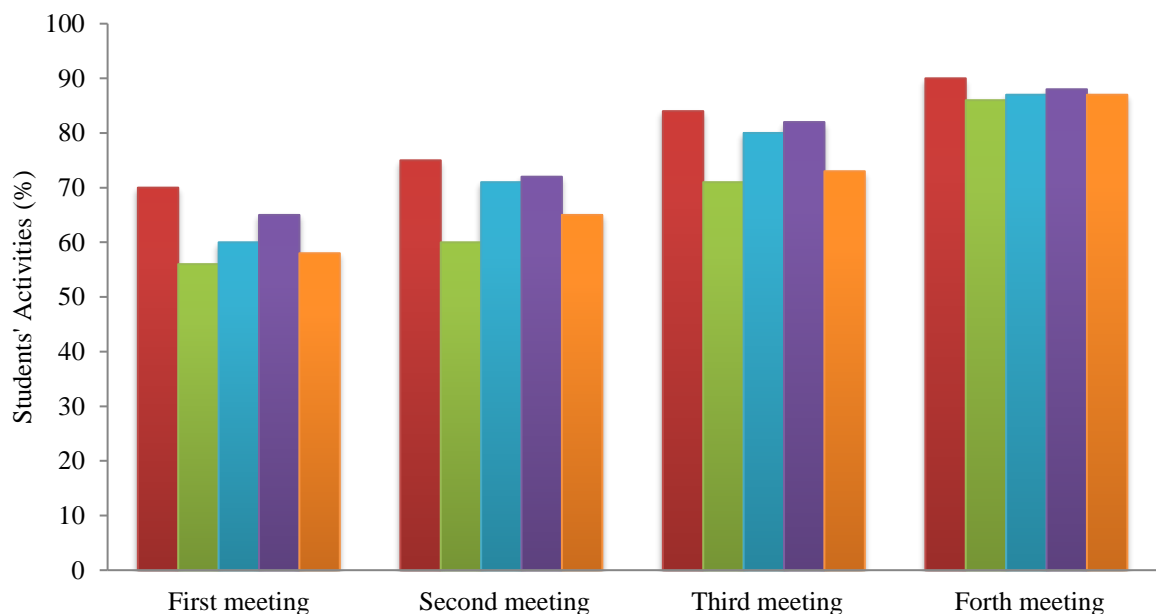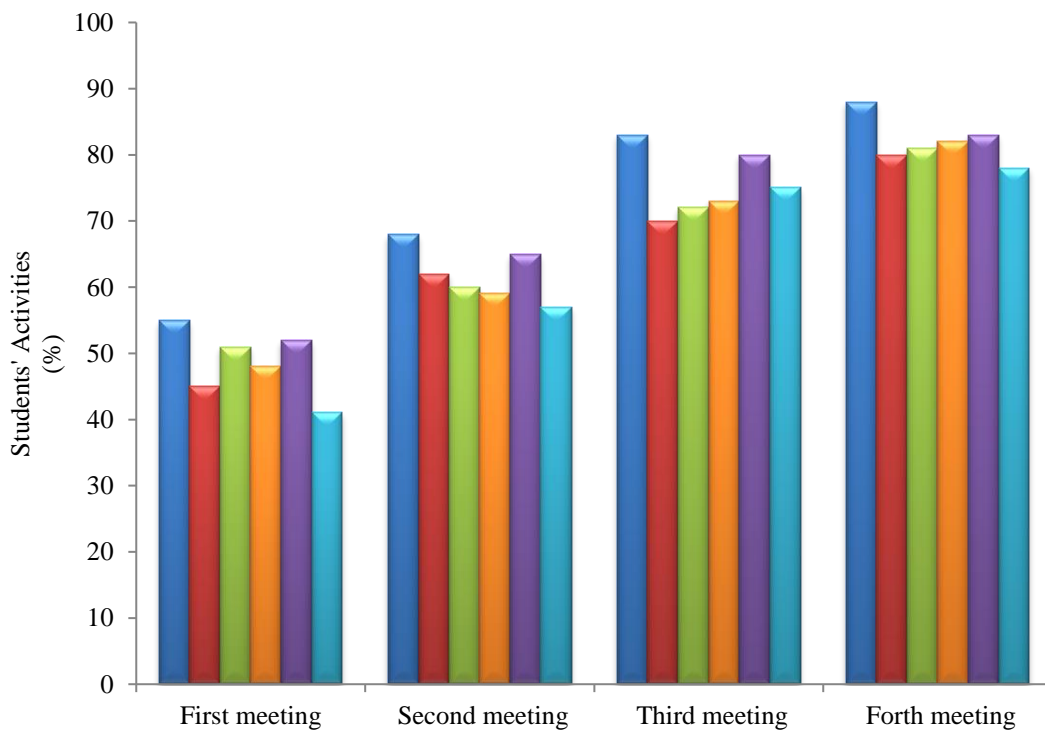

Figure 1. Learning activities of students in X IPA 3

Notes: Aspects 1-5 are introduction (red), problem solving (green), sharing and discussing (blue), summarising (purple), and learning assessment (light brown).

Based on the percentage of student learning activities in Figure 1, it can be seen that at the first meeting of the 5 aspects observed, the criteria were quite good. solving) with a percentage of 56%. At the second meeting of the 5 aspects observed, there were 3 aspects that had good criteria and 2 aspects had fairly good criteria, namely aspect 2 (problem solving stage) with a percentage of 60% and aspect 5 (assess learning) with a percentage of 57%. At meeting III it began to increase because the five aspects observed had good criteria, the aspect that had the highest percentage was aspect 1 (introduction stage) with a percentage of 84% and the lowest aspect was aspect 2 (problem solving stage) with a percentage of 71%. At the fourth meeting, student learning activities experienced a significant increase because the five aspects had very good criteria, the aspect that had the highest percentage was aspect 1 (introduction stage) with a percentage of 90% while those who obtained the lowest aspect were aspects 2 stages (problem solving) with a percentage of 86 %.

The percentage results related to student learning activities in class X IPA 4 can be seen in Figure 2.

Figure 2. Learning activities of students in X IPA 4. Aspect 1-6 are presented in blue, red, green, light brown, purple, and blue, respectively

Based on the picture above, it is known that the increase in student learning activity in class X IPA 3 is higher than in class X IPA 4. It is known that in class X IPA 3 which uses the interactive learning model, most aspects of the interactive learning model experience an increase in each meeting. At the first meeting, all aspects were in good enough criteria. Then at the second meeting, the problem solving and assess learning aspects were in quite good criteria, while the other three aspects were in good criteria. Then at the third meeting, all aspects were in good criteria. At the fourth

meeting all aspects were in very good criteria. Whereas in class X IPA 4 which uses the discovery learning model it is known that most aspects of the discovery learning learning model experience an increase in each meeting. At the first meeting, all aspects were in the unfavorable criteria. Then at the second meeting, all aspects were in good enough criteria. Furthermore, at the third meeting, the problem statement aspect and generalization aspect were in quite good criteria while the other four aspects were in good criteria. At the fourth meeting the stimulation aspects were in very good criteria, while the other five aspects were in good criteria.

The results of the normality test in this study were carried out using the Kolmogorov Smirrnov test with the help of the SPSS 26 program. The data is normally distributed if the Sig value obtained is greater than 0.05. The following table normality test results:

Table 1. Normality analysis

Statistik	X IPA 3		X IPA 4	
	Pretest	Posttest	Pretest	Posttest
Sig	0.200	0.200	0.200	0.200
Decision	Normal	Normal	Normal	Normal

Based on table 2, it is known that the pretest and posttest in class X IPA 3 have a Sig value of 0.200 each, so that the data can be said to be normal. Then for the pretest and posttest data in class X IPA 4 each has a Sig value of 0.200, so that the data can be said to be normal. Furthermore, for homogeneity testing in this study, it was carried out using the Levene's test in the SPSS 26 program. The data is said to have a homogeneous variance if the Sig value obtained is more than 0.05. Following are the results of homogeneity testing:

Table 2. Homogeneity analysis

| Statistics	Pretest	Posttest
Sig	0.520	0.150
Decision	Homogen	Homogen

Based on table 3, it is known that the pretest value for class X IPA 3 and class X IPA 4 obtained a Sig value of 0.520 while the Sig posttest value for class X IPA 3 and class X IPA 4 was 0.150. The Sig value is greater than 0.05 and it can be concluded that the data in this study has a homogeneous variance. To answer the hypothesis in this study, a t-test was carried out. This test was carried out on the SPSS 26 program. The following are the results of the t-test:

Table 3. t-test analysis

t-test	Results	
	Pretest	Posttest
Sig (2-tailed)	0,676	0.000
Decision	No different	Different

Based on table 3 it is known that the Sig (2-tailed) value obtained in the pretest data is greater than 0.05, which is equal to 0.676. This means that the average score between the two classes is not much different at the time of the pretest. Meanwhile, the

Sig (2-tailed) value obtained in the posttest data is less than 0.05, which is 0.000. This means that the average score between the two classes has a difference when doing the posttest. So the hypothesis in this study which says that there is a difference between the activities and learning outcomes of students who are taught using the interactive learning model with the learning activities of students who are taught using the discovery learning model is accepted, thus it can be said that the activities and learning outcomes with the interactive learning model provide the same results. better than using the discovery learning model. The following are the results of student learning from both classes
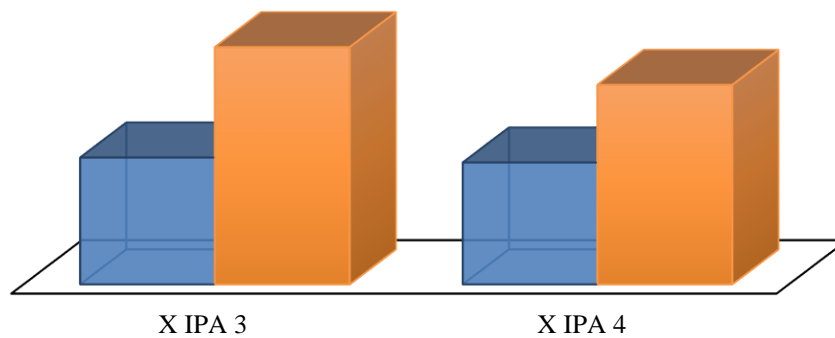
Figure 3. Percentage of student learning outcomes with pretest and posttest presented in blue and light brown.

Based on Figure 3, it can be seen the difference in the average value before being given treatment (pretest) and at the end after being given treatment (posttest). The average score for class X IPA 3 in the pretest was 44.63 while the average value for class X IPA 4 in the pretest was lower, namely 42.88. However, seen from the posttest results for class X IPA 3, namely 83.47, it was higher than the posttest results for class X IPA 4, namely 70.19. The N-Gain results of the two classes can be seen in the following table 4. The average gain normality obtained from students' understanding of environmental change material in class X IPA 3 reached 0.70 in the high category while in class X IPA 4 it reached 0.46 in the medium category.

Table 4. N-gain analysis of experimental and control group

Group	N-Gain	Category
Experiment	0.70	High
Control	0.46	Moderate

Based on the results of the hypothesis testing that has been described in the research results section, information is obtained that there are differences in learning activities and student learning outcomes in the two learning models applied. The learning models are the Interactive Learning model and the Discovery Learning model. The differences found are in accordance with the analysis conducted by the author that the interactive learning model has a high enough influence on learning activities and

student learning outcomes. It can be seen that at every meeting that uses the interactive learning model there is a significant increase in student learning activities and it can also be seen in the student learning outcomes that apply the interactive learning model to obtain a higher Gain normality. This is because in the interactive learning model there is an introduction stage where students are required to be able to ask questions about problems or images presented so that interaction occurs between the teacher and students.

Problem solving stage guide students to solve problems by formulating the problems and hypotheses to answer the problem. Next, there is the sharing and discussing syntax, at this stage there can be interaction between students and students because students exchange opinions about the results of their respective group discussions. This agrees with Sumiyati (2017) that the purpose of the interactive learning model is to increase students' active participation in learning, help students form effective ways of working together, share information and hear and use the ideas of others. Furthermore, there is a summarizing syntax at this stage students can conclude the material that has been taught and the teacher can assess students who have understood the material that has been taught. This is reinforced by Sofiah (2018) students tend to be more active with the application of interactive learning models because the learning atmosphere leads students to find understanding through interactions that occur in class, students easily understand the material being taught. Furthermore, there is the syntax of learning asses at this stage the teacher and students compare their knowledge before the material is taught and after it is taught. According to Primary et al. (2020), the main characteristic of this interactive learning model is that students will be invited to think about the concepts they will learn and then reflect through curiosity and manifest them in the form of questions. These questions will then be answered by the students themselves. In this case the teacher does not need to get too involved in answering student questions, but the teacher will give more questions based on the questions posed by students, so students will find answers to their own questions. Based on research conducted by Ratziani & Permana (2019) the interactive learning model can have an impact on student learning, create learning that communicates between students and with teachers so that it will increase student enthusiasm for learning and also encourage student motivation to become interested in the material being taught.

As for the discovery learning learning model, there is a stimulation syntax. At this stage, students are presented with problems or questions that can stimulate students' curiosity about the material being taught so that there is interaction between the teacher and students. Next, there is a problem statement syntax. At this stage, students identify problems that presented so that students can find out for themselves the causes or solutions to these problems. Furthermore, there is a data collection syntax. At this stage students obtain data from reading literature, observing the images or videos presented. Furthermore, data processing at this stage students capture the information needed to answer the questions given. According to Masdariah et al. (2018) the data collection process requires strong learning motivation in learning, perseverance and the ability to use their thinking potential so that at this stage students only rely on other friends to find answers to the questions given so that only some students are active and understand more about the material being taught. Furthermore, the verification stage at this stage students prove whether the statement they made is true or not by holding discussions

with other groups so that there is interaction between students and students. Furthermore, generalization syntax at this stage students can conclude about the material that has been taught, students are given the opportunity to express their opinions so that there is interaction between students and teachers. According to Cintia et al., (2018) discovery learning is a model that directs students to find concepts through various information or data obtained through observation or experiments. According to Wahyudi & Siswanti (2015) the discovery learning model is defined as a learning process that occurs when students are not presented with lessons in their final form, but students are expected to organize themselves. Based on research conducted by Amanda (2017) on the implementation of the discovery learning model, only a few students are active and students who are not active will depend on students who are often active so they lack a sense of responsibility in their learning. This results in students being more relaxed in learning because there is no competition between students so that students are less active and less motivated in participating in learning.

▪ **CONCLUSION**

There are differences in student learning activities using interactive learning and discovery learning models. This can be seen from every meeting that uses interactive learning has very good criteria from all aspects observed, while the class that uses the discovery learning model only has 1 aspect that has very good criteria and the other five aspects have good criteria. Moreover, there are differences in student learning outcomes using interactive learning and discovery learning models. This can be seen from the normality results of the Gain of the two classes which have differences, it is found that the normality results of Gain for class X IPA 3 using the interactive learning model reach 0.70 with a high category while the normality results for class X IPA 4 Gain which are applied to the discovery learning model reach 0. .46 with medium category.

▪ **REFERENCES**

Alfianti, R. A., Suprapta, B., & Andayani, S. E. (2019). *Model pembelajaran interaktif dan keterampilan sosial terhadap hasil belajar kognitif siswa pada pembelajaran sejarah di sma. Jurnal Pendiidikan, 4*(7), 938–943.

Ananda, R. (2019). *Perencanaan Pembelajaran*. Medan:LPPI.

Cintia, I.., Kristin, F., & Anugraheni, I.,. (2017). *Penerapan model discovery learning untuk meningkatkan kemampuan berpikir kreatif dan hasil belajar siswa. Jurnal Perspektif, 32(1)* 69-77.

Masdsriah., B & Nurhayati., Rachmawaty. (2018). *Kajian deskriptif model discovery learning meningkatkan motivasi belajar, aktivitas belajar dan hasil belajar peserta didik. Prosiding Seminar Nasional Biologi dan pembelajarannya.* Makasar:UNM.

Mukaramah, M., Kustina, R., & Rismawati. (2020). *Menganalisis kelebihan dan kekurangan model discovery learning berbasis audiovisual dalam pelajaran bahasa indonesia. Jurnal Ilmiah Mahasiswa Pendidikan, 1*(1), 1–9.

Murdiana, I. N. (2014). *Model pembelajaran interaktif seting kooperatif dalam pembelajaran matematika. Jurnal Kreatif Todulako Online*, 2(4), 385–406.), 385–

406.

Nasution, M. K. (2017). *Penggunaan Metode Pembelajaran Dalam Peningkatan Hasil Belajar Siswa*. *11*(1), 9–16.

Nugraha, S. A., Sudiatmi, T., & Suswandari, M. (2020). *Studi pengaruh daring learning terhadap hasil belajar matematika kelas IV*. *Inovasi Penelitian*, *1*(3).

Pratama, F. A., Al-Ghozali, M. I., & Ahmad, G. (2020). *Model pembelajaran interaktif untuk meningkatkan aktivitas siswa dalam pembelajaran ips tentang sumber daya alam di sekolah dasar* Interactive Learning Model to Increase Student Activities in Social Studies Learning About Natural Resources in Elementary Sc. *Action Research Journal Indonesia*, *2*(2), 116–125.

Saraswati, N. fathia, & Djazari, M. (2018). *Implementasi metode pembelajaran small group discussion untuk meningkatkan aktivitas belajar pada kompetensi dasar jurnal penyesuaian siswa kelas x akuntansi smk muhammadiyah kretek tahun ajaran 2017/2018*. *Jurnal Pendidikan Akuntasi Indonesia*, *XVI*(2), 15–23.

Siregar, W. D., & Simatupang, L. (2020). *Pengaruh model pembelajaran pbl terhadap aktivitas belajar dan hasil belajar siswa pada materi asam basa*. *Jurnal Inovasi Pembelajaran Kimia*, *2*(2), 91–96.

Sofiah, S. (2018). *Meningkatkan hasil belajar siswa melalui model pembelajaran interaktif berbasis aktivitas pada mata pelajaran PKn Kelas VI SD Negeri 111/IX Jaluko Kabupaten Muaro Jambi*. *Jurnal PGSD*, *11*(2), 91–99.

Sumiyati, Elfa. (2017). *Penggunaan model pembelajaran interaktif berbasis aktivitas untuk meningkatkan prestasi belajar siswa kelas vi pada pelajaran pkn sd negeri 09 kabawaten*. *Jurnal PGSD: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar, 10(2),* 66-72.

Sudarisman, S. (2015). *Memahami hakikat dan karakteristik pembelajaran biologi dalam upaya menjawab tantangan abad 21 serta optimalisasi implementasi kurikulum 2013*. *Jurnal Florea*, *2*(1), 29–35.

Tayeb, T. (2017). *Analisis dan manfaat model pembelajaran*. *Jurnal Pendidikan Dasar Islam*, *4*(2), 48–55.

Wahyudi & Siswanti, Mia Christy. (2015). *Pengaruh pendekatan saintifik melalui model disocvery learning dengan permainan terhadap hasil belajar siswa kelas 5 sd*. *Jurnal Scholaria, 5(3).* 23-36.

Wahyuningsih, R. (2020). *Pengaruh pendidikan kewirausahaan dan lingkungan keluarga terhadap minat berwirausaha mahasiswa STKIP PGRI Jombang*. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran dan Pembelajaran*, *6*(3), 512.

Widiantono, N., & Harjono, N. (2017). *Penerapan model pembelajaran interaktif untuk meningkatkan aktivitas dan hasil belajar ipa siswa kelas 5 sd*. *Jurnal Pendidikan Dan Kebudayaan*, *7*(3), 199–213.

Wirejati. (2019). *Refleksi metodologi tindakan kelas dalam peningkatan mutu hasil belajar siswa kelas ix.a smpn 7 pujut pada materi sistem ekskresi melalui pembelajaran kooperatif tipe student teams achievement divisions*. *Paedagogy*, 6(2), 59–65.