VOLUME 10 Issue 2
JANUARY 2026

E-ISSN: 2622-3384
P-ISSN: 2527-9939

JURNAL MEdu Mangifera Edu

Implementation of the nature exploration aproach to improve students' biology learning outcomes

Yunita Seuk Seran[1*], Fincensius Oetpah[2], Maria Paulin Saridewi[3], Vinsensia Ulia Rita Sila[4]
[1,2,3,4]Biology Education, Faculty of Teacher Training and Education, University of Timor, Jl. Km 9, Sasi Village, Kefamenanu-Timor-NTT, Indonesia
[*]Corresponding author: saridewiarkian@gmail.com

ABSTRACT

The science learning outcomes at Maumolo State Junior High School are not good because the average score of some students has not met the KKM standard. In addition, according to the science teacher, the application of the natural exploration approach is very potential to improve student learning outcomes, by learning directly in nature, students can observe natural phenomena directly, so that conceptual understanding becomes stronger besides this approach can also improve student learning outcomes. The purpose of this study is to improve student biology learning outcomes through the application of the natural exploration approach for students at Maumolo State Junior High School. The type of research used is quantitative. The research method uses Classroom Action Research (CAR). The steps of this research are planning, implementation, observation and reflection. Based on the results of student learning assessments in the first cycle there was an increase in student learning outcomes of 68.75% which is quite good, but has not met the research objectives. In cycle II, there was an increase in student learning outcomes of 93.75%, indicating that the assessment of student learning outcomes had reached the desired completion, namely at a very high interval. Based on the assessment of student learning outcomes, it can be concluded that the application of the Natural Exploration (JAS) approach was able to improve student learning outcomes in the Science subject of grade VII students of SMP Negeri Maumolo.

ARTICLE INFO

Keywords
Biology learning, Classroom action research, Junior high school, Learning outcomes, Natural exploration approach.

Received
November 11, 2025

Revised
December 05, 2025

Accepted
January 12, 2026

Published
January 31, 2026

How to cite
Seran, Y.S., Oetpah, F., Saridewi, M. P., & Rita Sila, V. U. (2026). Implementation of the nature exploration approach to improve students' biology learning outcomes. *Jurnal Mangifera Edu*, *10*(2), 236-248. https://doi.org/10.31943/mangiferaedu.v10i2.251.

INTRODUCTION

The implementation of learning can be interpreted as a starting point or perspective on the learning process, which refers to the view of the occurrence of a teaching and learning process that is still very general in nature, in which it accommodates, inspires, strengthens, and underlies learning methods with a certain theoretical scope (Erica, 2019). In the teaching and learning process, not only the approach must be considered but also the strategies, techniques, methods and models used in learning must be appropriate and suitable for the material taught by the teacher, in terms of choosing the approach, method and learning model, the teacher plays an important role in preparing the teaching and learning process because in essence learning is an active activity of students in building understanding or meaning from what has been learned so that it can be applied in real life. Monotonous learning patterns often lead students to experience saturation or boredom when

receiving lessons (Susanti *et al.*, 2024). Therefore, teachers are required to carry out the latest innovations in the teaching and learning process. The chosen innovation should involve students in the teaching and learning process.

Understanding biological concepts can be achieved through a variety of simple activities that students can observe and carry out. However, effective learning resources can help students grasp potentially difficult material. To ensure students understand what the teacher has conveyed, methods and approaches must be tailored to the characteristics of the object and subject of study. Understanding biological concepts can be achieved through a variety of simple activities that students can observe and carry out (Ahmadi, 2021). One approach to learning biology can help students understand it more easily. This approach is easy to understand and in accordance with the characteristics of biology, involving exploration of the natural world around us. An approach that explores the natural surroundings is a learning approach that uses the environment around it as an object. Study students whose phenomena can be investigated scientifically. This approach involves more of one's own characteristics, activities, observations, or explorations that make the atmosphere more interesting (Rosalina et al., 2021). The natural exploration method encourages students to build knowledge based on direct experience and biological ideas through research and investigation (Fitriana et al, 2024). Whatever the reason, it is a fact that protected natural areas have a rich biological heritage (Sefali, 2021). Based on previous research, implementing environment-based biology learning strategies through a combination of indoor and outdoor learning can enhance students' process skills and is applicable at the high school level (Zukmadini et al., 2018).

The Ministry of Education and Culture Regulation No. 16 of 2022 on process standards states that to achieve learning objectives, it is essential to implement high-quality teaching strategies, including optimizing the use of available resources in the educational environment and the community (Agustini, 2025). Meanwhile, outdoor learning, according to Nugrawati et al. (2019), refers to learning activities conducted outside the classroom that directly involve nature as a learning resource. Environmentally based biology learning will not be monotonous. It will be an interesting learning activity that will motivate and foster greater curiosity in students towards biodiversity materials as a subject they should associate with their lives (Irmadora et al., 2020). Students who achieve excellence are often associated with perceptions of environmental preservation (Ichsan et al., 2019). By immersing students in real-world environments, whether cultural or natural, this method enhances conceptual understanding, increases motivation, and fosters more profound and meaningful learning experiences (Cahyana et al., 2020; Rosita et al., 2025).

Interview results with science teachers at Maumolo State Middle School revealed that the condition of science learning at the school still needs improvement due to a lack of laboratory facilities and methods, and because learning is still largely conventional. This results in a lack of student activity and less engaging learning experiences during the learning process. In addition, the availability of learning media remains limited, and the most frequently used learning methods are lectures and discussions. For exploring the natural environment, it has not yet been used. The same approach is used. Science learning outcomes at Maumolo State Middle School not good enough because average student grades some haven't fulfil KKM standards, according to science teachers, the implementation of approach explore natural around very potential for increase results Study

students, with Study directly in nature, students can observe phenomenon natural in a way directly, so that understanding draft become more strong besides That approach this can also increase results Study students. Relationship results Study student with approach explore natural surroundings around is student can interact directly with the environment around so that student can link theory with practice to strengthen their understanding.

Based on the above problems, Innovation in learning methods and approaches is needed to improve student learning outcomes. One alternative approach to learning biology is to take the learning process outside the classroom, such as by using the school's natural surroundings. One of the learning processes used to achieve this competency is through an exploratory approach, a lam s ekitar (Oktaviani, 2025). An approach that emphasizes the natural environment around students' lives and the real world explores learning activities linked to these contexts (Susilawati, 2021). An exploratory approach can yield diverse insights from students' approaches. This allows students to learn various concepts and relate them to the real world, thereby improving their learning outcomes (Unesa, 2025). This research aims to improve student outcomes in Study biology through an implementation-based approach, exploring the natural environment at Maumolo State Middle School.

METHOD

This study was conducted at Maumolo State Middle School in August 2025. The research design used in the study is Classroom Action Research (CAR). Research is conducted through a series of cycles comprising 4 stages: planning, action, observation, and reflection. The variables used in the study are two variables, namely the free or *independent variable* (X), which is the variable whose variations influence another variable is Approach Natural Exploration (JAS) and the bound or *dependent* variable (Y), which is variables measured in the research for known size effect or influence on another variable. The results of studying biology. Population in study: All students in Class VII at Maumolo State Middle School. At the same time, the sample provides a general description of the population. The Sample in the study: the VIIA class at Maumolo State Middle School. To obtain data for this study, the researcher uses a data collection tool comprising observation, tests, and documentation.

Data analysis techniques in classroom action research include observing data analysis and testing student results.

1. Observation of data analysis

   The data observations used are the result data observation activity, student activity, and teacher activity. Result data were observed in a form table, then analyzed using a formula. According to Sugiyono (2019), the amount of scores of students and teachers can be counted equally as follows:

$$NP = \frac{\mathrm{R}}{\mathrm{SM}} \times 100\%$$

   The expected percentage value (NP) was calculated based on the raw scores (R) obtained by students and teachers in relation to the maximum score of the test (SM). This calculation was used to determine the level of achievement in percentage form. The resulting percentage values

were then interpreted using the following categories: scores ranging from 0–49 were classified as *not good*, scores from 50–69 were categorized as *good enough*, scores from 70–89 were considered *good*, and scores from 90–100 were classified as *very good*.

2. Testing student results

   In research This is for known completeness results. Study student Good in a way, individual and group used guidelines completeness as follows:

   a. Completeness individual

      A student, it is said, reaches completeness in study when the mark results in study are more significant. The same applies to the (>) value criteria, with a minimum completion set by the school at 70, according to the formula (Hekin, 2023). As for the formula mark results, Study:

$$Learning\ outcomes = \frac{\text{Score}}{\text{Total score}} \times 100$$

   b. Completeness classical

      A class is considered successful (achieved completeness) if at least reached 70% of the total data in the class has been reached, indicating completeness. To determine presentation from achievement completeness, the class used the formula (Hekin, 2023).

$$Achievement\ completenes = \frac{s}{t}\ x\ 100\%$$

      The level of learning completeness was determined by considering the number of students who achieved completeness (s) compared to the total number of students in the class (t). In this context, s represents the total number of students who successfully met the required completeness criteria, while t refers to the overall number of students participating in the class. These variables were used to describe the proportion of students who reached the expected level of achievement in the learning process.

RESULTS AND DISCUSSION

This is a study action class implemented at Maumolo State Middle School. Students using an implementation approach to explore natural material classification in the life of creatures in students' Class VII A. Activities learning implemented in two cycles. Each cycle consists of four stages, namely, planning, implementation, observation, and reflection. Based on research that has been conducted at Maumolo State Middle School in the odd semester year of the academic year 2025/2026. Granting action in the study. This has been ongoing for 2 cycles. Based on results and observations of the learning process, problems were found: the student does not sufficiently understand the learning approach, Exploring the Surrounding Nature (JAS). This caused by Because new First the first time the teacher applies approach learning this and not yet Once apply approach learning previously, so that when do observation student feel confused.

1. Description cycle I

   a. Observation data activity student

      Observation results of the activity of the student during the implementation of the action cycle are shown in Table 1.

Table 1. Observation results activity student cycles I

No	Student name	Activity value student					Amount score
		1	2	3	4	5	
1	A A	3	3	2	2	1	11
2	AVA	3	3	2	3	2	13
3	AK	3	3	2	2	2	12
4	BA	2	3	1	1	1	8
5	DH	3	3	2	3	2	13
6	JN	3	3	2	2	1	11
7	JAM	2	2	1	2	1	8
8	JKMK	3	3	2	2	2	12
9	MRT	2	2	2	1	1	8
10	SAK	3	2	1	2	1	9
11	SJA	4	3	3	3	3	16
12	SMS	2	2	1	2	1	8
13	TMS	3	3	2	2	3	13
14	VPN	4	4	2	2	3	15
15	WL	2	2	1	2	1	8
16	YE	3	3	2	3	3	14
Amount score		**45**	**44**	**28**	**34**	**28**	**179**
Maximum score		**64**	**64**	**64**	**64**	**64**	
Presentation		**70.31**	**68.75**	**43.75**	**53.12**	**43.75**	
Average				**55.93**			
Category				**Good Enough**			

Based on the results shown in Table 4.1, it can be concluded that the average value of observations activity student starts from the activity beginning, core activities, and closing, with a score of 179 and an average value of 55.93, in the category Good enough.

b. Observation data teacher activities cycle I

Regarding the results, teacher activities are shown in Table 2.

Table 2. Observation results teacher activities cycle I

No	Aspects observed	Assessment score
1	The teacher opens learning with give regards	4
2	The teacher checks presence students (doing apperception)	3
3	The teacher conveyed material learning and goals learning	4
4	The teacher divides student in a number of groups	3
5	The teacher explains guide activity Study with approach explore natural around	3
6	The teacher directs student about activities that will be done	4
7	The teacher gives chance student for respond and ask questions If there are some who haven't understood	3
8	The teacher invites student go out class going to the location used as activity explore natural around namely in the environment around school	3
9	Teacher accompanies student do activity Study with approach explore natural around	3
10	The teacher gives strengthening about material learning	4
11	The teacher gives conclusions regarding learning that has been done	3
12	The teacher shares sheet Work participants education (LKPD) for know whether happen improvement interest learning in students	3
13	The teacher gives action carry on learning	3
14	The teacher closes learning with prayer and giving regards	4
Amount score		**47**
Maximum score		**56**
Average		**83.92**
Category		**Good**

Based on the results of teacher observations in Table 4.2, it can be seen that, on average, every observed indicator in the manage learning cycle I has a total score of 47 and an average value of 83.92, with the category "Good".

c. Data on student learning outcomes completion scores from pretest and posttest results of cycle I

Observation of results: Study students in cycle I obtained the following results. Completion Study student in accordance with the Minimum Completion Criteria (KKM) implemented at Maumolo State Middle School is 70. From the results of the research that uses the Natural Exploration (JAS) approach, as seen in Table 3.

Table 3. Data completeness results, Study student *pretest* and *posttest* cycle I

No	Student name	*Pretest*	Information	*Posttest*	Information
1	A A	50	BT	70	T
2	AVA	70	T	80	T
3	AK	55	BT	70	T
4	BA	45	BT	65	BT
5	DH	70	T	75	T
6	JN	60	BT	70	T
7	JAM	55	BT	70	T
8	JKMK	70	T	75	T
9	MRT	50	BT	60	BT
10	SAK	45	BT	60	BT
11	SJA	75	T	85	T
12	SMS	50	BT	60	BT
13	TMS	55	BT	70	T
14	VPN	75	T	80	T
15	WL	45	BT	60	BT
16	YE	70	T	70	T
Amount		**940**	**Q: 6 BT: 10**	**1,120**	**Q: 11 BT: 5**
Average		**58.75**		**70.00**	
Completeness classical		**37.5%**		**68.75%**	

Based on the data in Table 3, it shows that results of the *pretest* and *posttest* obtained from students in cycle I were proven with:

Completeness individual

Of the 16 students who participated in test cycle I in the *pretest*, only 6 students had reached the minimum completeness criteria (KKM), that has been determined by the school namely 70 and 10 students. Not yet reach minimum completeness, whereas in *the posttest,* students who achieve a minimum completion of 11 and 5 students have not yet reached minimum completion.

Completeness classical

Presentation completeness classical cycle I in pretest is 37.5% of students who achieved completeness class. The result obtained from the 6 students who have reached completeness is shared among all students, namely 16 students, and multiplied by 100%, whereas in the posttest, 68.75% of students achieved completeness in class. With this, then learning in cycle I and mastery of the material has not yet succeeded.

The results of data analysis in cycle I show existence improvement results Study biology significant students after its implementation approach explore natural around (JAS). On the

indicator average value, occurs increase mark from 58.75 seconds *pretest* to 70 on *posttest*. Ascension mark indicates that activity learning that utilizes environment around as source learning, as with use approach explore natural around, able facilitate understanding draft biology student in a way more concrete and meaningful. Likewise on the indicators completeness classical, presentation students who achieved KKM increased drastic from 37.5% in *the pretest* to 68.75% in *the posttest*. This data show improvement individual student success in control material. However, this 31% increase Not yet fulfil indicator success established research 70 % completion classical.

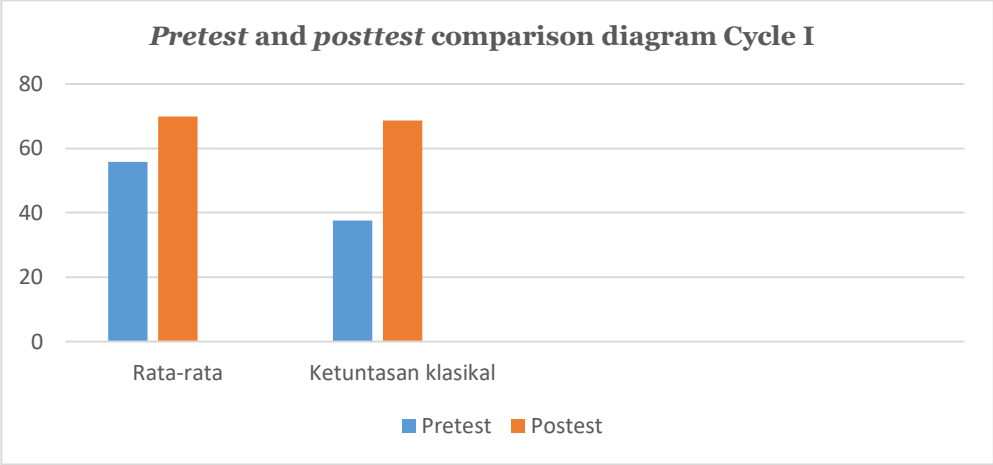

Figure 1. Comparison of pretest and posttest cycle 1

Observing results the researchers continue research on cycles second with hope can increase results Study students at school. The results of teacher observations in cycle I were: with total 83.92 with category Good Whereas results teacher observations in cycle II averaged 96.42 with very good category. So, the results observation teacher activities in cycle I and cycle II with use approach Explore natural around (JAS) already complete. Research results This is also supported by research Rahmaningtyas (2024) approach Explore the Natural Surroundings own a number of principles that must be noticed by the teacher in apply it in learning namely : a) With learning natural around teachers can demonstrate in a way direct in accordance with properties or base teaching b) Teaching natural around give chance as much as possible so that the child active or active No just sit, listen and take notes only, c) Teaching natural around allows For give teaching in a way totality, d) Teaching natural around give to child material apperception strong intellectual No verbality, e) Teaching natural around give apperception emotional because natural around have bond emotional with child.

Research conducted by Amini (2015); Firmansah & Gusti Putu Suryadarma (2019); Irmadora et al. (2020); and Irawati (2021) also indicates that learning involving the natural environment as a learning resource influences students' learning process. Likewise, the research results of Murti and Maya (2021) show that nature-based learning can improve student learning outcomes. Firmansyah et al., (2019) The experimental-based Natural Environment Exploration Model improves students' critical thinking skills in both indoor and outdoor learning. The results of Rohani and Alimah's (2024) research indicate that the Discovery Learning Natural Environment Exploration Model improves students' critical thinking and science process skills. The research results of Riastuti et al (2025) show that the integrated research-based learning model through environmental exploration

is relevant as an innovative curriculum for preparing prospective biology teachers who are reflective and research-oriented.

The Environmental Exploration method can be useful for exploring students' understanding of a concept and the relationships among biological concepts, and students will gain direct experience in learning (Rahayu et al., 2024). The JAS learning method invites students to think globally, regarding the importance of the environment. Working and learning based on the surrounding environment provides added value, both for the learner themselves and for the surrounding environment (Zubaidah, 2021). Research conducted by Fadlia shows that making a learning journal using the JAS approach has a good effect on learning outcomes in the cognitive, affective and psychomotor domains (Ahmadi, 2021).

2. Description cycle II

a. Observation data activity student cycle II

As for the results observation activity, students can see in Table 4.

Table 4. Observation results activity student cycle II

No	Student name	Activity value student					Amount score
		1	2	3	4	5	
1	A A	4	4	2	4	3	17
2	AVA	4	4	4	4	4	20
3	AK	4	3	3	3	4	17
4	BA	4	4	3	3	3	17
5	DH	4	3	3	4	3	17
6	JN	4	4	3	4	4	19
7	JAM	3	4	2	3	3	15
8	JKMK	4	4	3	3	4	18
9	MRT	4	4	3	4	3	18
10	SAK	3	3	3	3	3	15
11	SJA	4	4	4	4	4	20
12	SMS	4	4	3	3	3	17
13	TMS	4	4	3	4	4	19
14	VPN	4	3	3	4	4	18
15	WL	4	4	3	4	3	18
16	YE	4	4	3	3	3	17
Amount score		**62**	**60**	**48**	**57**	**55**	**282**
Maximum score		**64**	**64**	**64**	**64**	**64**	
Presentation		**96.87**	**93.75**	**75**	**89.06**	**85.93**	
Average					**88.12**		
Category					**Good**		

Based on the results shown in Table 4, the average value of the observations of student activity was 88.12, which is considered to be in the good category. Then, implementation action II is completed.

b. Observation data cycle II teacher activities

Regarding the results, teacher activities are shown in Table 5.

Table 5. Observation results teacher activities cycle II

No	Aspects observed	Assessment score
1	The teacher opens learning with give regards	4
2	The teacher checks presence students (doing apperception)	4
3	The teacher conveyed material learning and goals learning	4
4	The teacher divides student in a number of groups	4
5	The teacher explains guide activity Study with approach explore natural around	4
6	The teacher directs student about activities that will be done	4
7	The teacher gives chance student for respond and ask questions If there are some who haven't understood	3
8	The teacher invites student go out class going to the location used as activity explore natural around namely in the environment around school	4
9	Teacher accompanies student do activity Study with approach explore natural around	4
10	The teacher gives strengthening about material learning	4
11	The teacher gives conclusions regarding learning that has been done	4
12	The teacher shares sheet Work participants education (LKPD) for know whether happen improvement interest learning in students	4
13	The teacher gives action carry on learning	3
14	The teacher closes learning with prayer and giving regards	4
Amount score		**54**
Maximum score		**56**
Average		**96.42**
Category		**Very good**

Based on results observations that appear in table 5 above, can be seen that evaluation every observed indicators in manage learning in cycle II was at an average value of 96.42 with very good category.

c. Value data completeness results Study student from pretest and posttest results

As for the results test can see in table 6.

Table 6. Value data completeness results study student *pretest* and *posttest* cycle II.

No	Student name	*Pretest*	Information	*Posttest*	Information
1	A A	65	BT	75	T
2	AVA	80	T	90	T
3	AK	75	T	85	T
4	BA	55	BT	70	T
5	DH	70	T	80	T
6	JN	65	BT	75	T
7	JAM	65	BT	70	T
8	JKMK	75	T	85	T
9	MRT	65	BT	70	T
10	SAK	60	BT	60	BT
11	SJA	85	T	90	T
12	SMS	70	T	80	T
13	TMS	70	T	75	T
14	VPN	75	T	85	T
15	WL	60	BT	70	T
16	YE	80	T	80	T
Amount		**1,115**	**Q: 9 BT: 7**	**1,240**	**Q: 15 BT: 1**
Average		**69.69**		**77.50**	
Completeness classical		**56.25%**		**93.75%**	

Based on the data in table 6 it shows that results pretest and posttest obtained students in cycle II were proven with:

Completeness individual

Of the 16 students who participated test cycle II in the pretest, only 9 students had reach criteria minimum completeness (KKM) that has been determined school that is 70 and 7 students Not yet reach minimum completeness, whereas in the posttest students who achieve minimum completion of 15 students and 1 student Not yet reach minimum completion.

Completeness classical

Presentation completeness classical cycle II on pretest is 56.25% of students who achieved completeness class while in the posttest is 93.75% of students who achieved completeness class. With thus, then learning in cycle II and mastery student to material Already succeed.

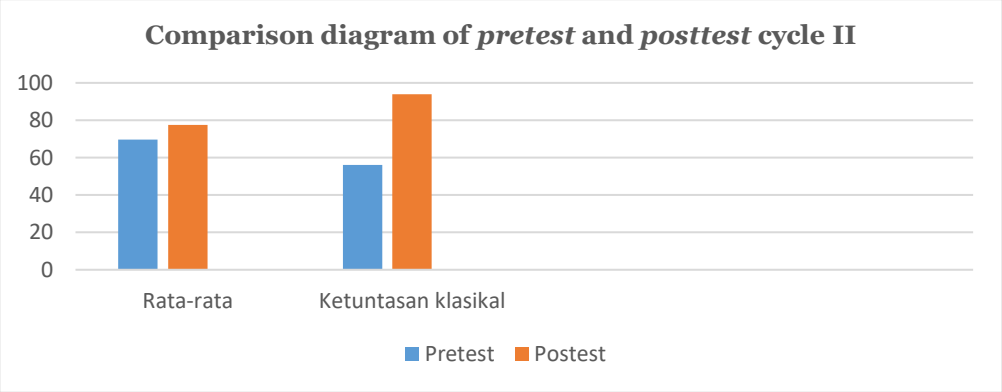

Figure 2. Comparison diagram of pretest and postest cycle II

Data in cycle II shows that approach explore natural around proven effective in increase results Study biology students of Maumolo State Middle School. On the indicator average value of results Study student experience increase mark from 69.69 (pretest) to 77.50 (posttest). Increase mark indicates that experience in a way directly in nature around through approach explore natural around succeed facilitate understanding draft more biology depth and retention more information Good for student. Likewise, the most prominent improvements seen on on presentation completeness classical, which is increasing from 56.25% (pretest) to 93.75% (posttest). This figure of 93.75% has exceeding the indicator target success 70% research confirms that approach explore natural around succeed make material become contextual, relevant, and interesting, so majority big students (93.75%) were able reach criteria minimum completion (KKM). Observing results the researchers no continue research in cycle III because results learning has improved greatly.

Observation results students in cycle I with average number of 55.93 with category Good Enough whereas results observation activity students in cycle II with average number of 88.12 with category good. So, the result observation activity students in cycles I and II with use approach Exploring the Environment (JAS) on the material Classification Living creatures have complete. This is happened Because approach Natural Exploration (JAS) is learning that is carried out outside room for example in the environment school can made into as source learning that can give chance for student For Study more active and creative (Nasution, 2020). In the condition initial *pretest* cycle I,

is condition before implemented approach explore natural around (JAS), as many as 16 students who following the lesson and 6 students stated complete learning and students who have not complete study 10 people. Completion classical cycle I on *pretest* 37.5 % This because of 6 students only what is stated complete Study whereas in the condition *post-test* students who are declared complete Study totaling 11 people and those who have not complete totaling 5 people. Completion classical *posttest* 68.75% of the items This because of 11 students only what is stated complete study. Pay attention results the researchers continue research on cycles second with hope can increase results Study students at school. Based on results analysis and reflection in cycle I, necessary existence repair actions in cycle II so that the results Study student Can increased. As for the action improvements that will be done is a number of students not enough active in group, less teachers can arrange time in a way efficient, in discussion, students not enough enthusiastic, maybe caused by Because during This discussion almost No Once done so that student feel Still foreign. Research by Aly (2022) shows that the Natural Exploration (JAS) learning model significantly improves the mastery of concepts of class VIII students at MTs-Al-Farabi Wasilei Selatan.

CONCLUSION

Based on results research that has been writer carry out about implementation approach explore natural about (JAS) on the material classification creatures lives in class VIIA of Maumolo State Middle School so can concluded as following: 1) Cycle I pretest, there were 6 students who completed and 10 students who failed. Not yet complete, thorough classical namely 37.5% while in the posttest, there were 11 students who completed and 5 students who did not. Not yet complete learning. Completion classical namely 68.75%; 2) Cycle II pretest, there were 9 students who completed and 7 students who failed. Not yet complete, thorough classical namely 56.25% while posttest, there were 15 students who completed and 1 student Not yet complete learning. Completion classical namely 93.75%; 3) Through implementations This research contributes to innovative and contextual learning strategies, helps teachers design structured and systematic field observation activities, and enhances teachers' creativity in utilizing the surrounding environment as a learning resource. Furthermore, this research contributes to students' motivation, curiosity, and environmental awareness, and helps them understand biological concepts in a concrete, rather than theoretical, way. On approach explore natural around can increase results Study student.

REFERENCES

Agustini. (2025). The influence of outdoor -based discovery learning model on critical thinking skill in ecosystem material. JPBI (Jurnal Pendidikan Biologi Indonesia). Vol 11 (1): 136-144 https://doi.org/10.22219/jpbi.v10i3.34820

Ahmadi. (2021). *Optimization Employee Motivation and Performance: Understanding the Influencing Factors*. Yogyakarta: Bintang Pustaka Madani.

Ahmadi, A. (2021). Improving Student Learning Outcomes in Science Subjects Through LearningUsing the Environmental Exploration (Jas) Approach. Old Teachers: Journal of Education and Learning, 4 (1), 25–32. https://doi.org/10.31970/gurutua.v4i1.64

Aly, Muhhamad Iksan. (2022). Pengaruh Model Pembelajaran Jelajah Alam Sekitar (JAS) Terhadap Penguasaan Konsep Siswa Kelas VIII MTs-Al-Farabi Wasilei Selatan Kabupaten Halmahera Timur. JBES: Journal of Biology Education and Science. Vol 2 (1): 25–35 https://jurnal.isdikkieraha.ac.id/index.php/jbes/article/view/297

Amini, R. (2015). Outdoor Based Environmental Education Learning and Its Effect in Caring Attitude Toward Environment. Jurnal Pendidikan IPA Indonesia, 4(1), 43– 47. https://doi.org/10.15294/jpii.v4i1.3500

Cahyana, U., Rahmawati, Y., Paristiowati, M., Sasmoko, S., Ahman, A., Ferdianto, J., & Dudung, A. (2020). Ethnopedagogy integration with mobile learning to improve students' learning achievement in remote areas.Universal Journal of Educational Research, 8(5), 1687–1697. https://doi.org/10.13189/ujer.2020.080505

Erica D., Haryanto, H., Rahmawati, M., & Vidada , I. (2019). The role of parents to education child age early in view Islam. Perspectives on Education and Teacher Training, 10(2), 58-66. Universal Education, April 2017, 8–22. https://doi.org/10.25299/perspektif.2019.vol10(2).3993

Firmansah, & Gusti Putu Suryadarma, I. (2019). The Influence of Outdoor Learning Model in Biology Instruction on the Environmental Care Attitude of the Senior High School Student. Journal of Physics: Conference Series, 1233(012012), 1–7. https://doi.org/10.1088/1742-6596/1233/1/012012

Firmansyah, R., Wachidah, N., & Khabibah, A. M. (2019). Profil Penerapan Model Experiential Jelajah Alam Sekitar dalam Pembelajaran Biologi di SMA Krista Mitra Semarang. Prosiding Seminar Nasional Sains Dan Entrepreneurship VI Tahun 2019, 1–3. http://conference.upgris.ac.id/index.php/snse/article/view/158

Fitriana, D.E.N, Erni Yunita, Lola Hapidah, Ummu Khotifah. (2024). Analysis of the Use of The Natural Exploration Method on Biodiversity Concepts on Senior High School Students Interest and Learning Motivation. International Journal of Biology Education Towards Suitanable Development. Vol 4 (2). https://doi.org/10.53889/ijbetsd.v4i2.527

Hekin, Yasinta Bungkang., Taty Sulastry, dan Eda Lolo Allo. (2023). The Effectivness of Giving Quiz at The Beginning of The Learning in The Discovery Learning Model Toward Learning Outcomes Students on Buffer Solution Materia in Class XI IPA of SMA Negeri 3 Pangkep. Unesa Journal of Chemical Education. Vol 12 (2): 92 – 101 https://doi.org/10.26740/ujced.v12n2.p92-101

Ichsan, I. Z., Sigit, D. V., Miarsyah, M., Azrai, E. P., & Heryanti, E. (2019). Students' pro-environmental behavior and environmental learning outcomes based on green consumerism. Jurnal Pendidikan Biologi Indonesia, 5(1), 109–116. https://doi.org/10.22219/jpbi.v5i1.6447

Irmadora, C., Djufri, & Pada, A. U. T. (2020). Students learning motivation towards environmental-based biological learning activities. Journal of Physics: Conference Series, 1460(012071), 1–5. https://doi.org/10.1088/1742-6596/1460/1/012071

Murti, W., & Maya, S. (2021). The Effectiveness of Environmental Learning Model on Students' Motivation and Learning Outcomes. Lentera Pendidikan: Jurnal Ilmu Tarbiyah Dan Keguruan, 24(2), 255–263. https://doi.org/10.24252/lp.2021v24n2i8.

Nasution, Nirmala Sari. (2020). Outdoor Learning in Improving Learning Outcomes Ecosystem and Planting Environmental Love Characteristics of Students at SMP Negeri 1 Labuhan Deli. Journal Fife Educational Sciences. Vol 6(1): 15-28. https://doi.org/10.37755/sjip.v6i1.285

Nugrawati, Y., Ahmad, H., & Samad, I. (2019). The effectiveness of the outdoor study method on mathematics learning outcomes in statistics material. Journal Peguruan. Vol 1(2): 39-44 http://dx.doi.org/10.35329/jp.v1i2.549

Oktaviani. (2025). Pembelajaran Ilmu Sosial Berbasis Lingkungan sebagai Upaya Meningkatkan Kesadaran Sosial Siswa Sekolah Dasar. Journal of Humanities, Social Science, and Education (JHUSE), Vol 1 (3): 105-117 https://doi.org/10.64690/jhuse.v1i3.53

Rahayu, E., Melyani Sari Sitepu., Anisa Rahma. (2024). The Influence of the Natural Exploring Method on Student Learning Outcomes in Class IV Science Subject As at Muhammadiyah 11 Medan Primary School. Proceeding INSIS : International Seminar of Islamic Studies https://doi.org/10.3059/insis.v0i1.18400

Rahman, S. (2022). The Importance of Motivation Learning to Improve Learning Outcomes.In Proceedings of the National Seminar on Elementary Education. https://ejurnal.pps.ung.ac.id/index.php/psnpd/article/view/1076

Rahmaningtyas, Hardianika, Dini Rakhmawati, Arri Handayani. (2024). Peningkatan Wawasan Pendidikan Anak Usia Dini Melalui Strategi Belajar Outdoor. Jurnal Ilmiah PGSD FKIP Universitas Mandiri. Vol 10 (1): 1983 – 1991. https://doi.org/10.36989/didaktik.v10i1.2747

Riastuti, R. D., Aminah, S., Febrianti, Y., & Rahmi, R. (2025). Integrated research-based learning model through environmental exploration: A strategy for improving students' scientific article writing skills.Jurnal Kependidikan: Penelitian Inovasi Pembelajaran,9(2), 186–195. https://doi.org/10.21831/jk.v9i2.79593

Rohani, D.S, dan Siti Alimah. (2024). The Effect Of Discovery Learning Natural Environment Exploration Model on Digestive System Materials Towards Critical Thinking and Science Process Skills. Journal of Biology Education UNNES. Vol 13 (1): 55-62. http://journal.unnes.ac.id/journals/ujbe/article/view/4094

Rosalina, Rifana Desi, et al. (2021). Learning Outcomes Students' Cognitive and Science Process Skills (KPS) with Implementation Approach Environmental Exploration (JAS) on Pollution Material Environment. Journal of Biology Education. Vol 9(2): 10-18. http://dx.doi.org/10.25157/jpb.v9i2.6282

Rosita, L., Sumarmi, S., Astina, I. K., Utaya, S., & Bachri, S. (2025). Enhancing enjoyable learning in geography education through field trips to wetland ecosystems: A mixed-method study.Educational Process International Journal, 14(1). http://dx.doi.org/10.22521/edupij.2025.14.73

Sefali, Abdurrahman and Esra Ozay Kose. (2021). The Effect of Nature Education Ativities on Biophilia Levels of Science Teacher Candidates. Journal of Science Learning. Vol 4 (4): 357-364. https://doi.org/10.17509/jsl.v4i4.33434

Sugiyono. (2019). Metode penelitian kuantitatif, kualitatif, dan R&D (Cetakan ke). ALFABETA

Susanti, Sani, Fitra Aminah, Intan Mumtazah, Mey Wati Aulia, Tania Angelika. (2024). Dampak Negatif Metode Pengajaran Monoton terhadap Motivasi Belajar Siswa. PEDADOGIK: Jurnal Pendidikan dan Riset. Vol 2 (2) :86-93 https://doi.org/10.65311/pedagogik.v2i2.529

Susilawati. (2021). Pembelajaran Sains Melalui Pendekatan Eksplorasi Lingkungan Alam Untuk Meningkatkan Kemampuan Kognitif Anak Usia Dini. Jurnal Ceria. Vol 4 (6) https://doi.org/10.22460/ceria.v4i6.p%p

Unesa. (2025). Belajar dengan Tantangan Real World Bikin Siswa Lebih Siap. https://pgsd.fip.unesa.ac.id/post/belajar-dengan-tantangan-real-world-bikin-siswa-lebih-siap

Zubaidah. (2021). Implementation of the Environmental Exploration Method in Improving Learning Outcomes for Class II Students at SDN 2 Nata, Palibelo District, Bima Regency. STKIP Bima Education Journal. Vol 3 (1): 1–11. https://doi.org/10.33627/gg.v3i1.464

Zukmadini, A.Y., Karyadi, B. & Trisnawati, W. (2018). Environmental-based biology learning strategies through a combination of indoor and outdoor learning as an effort to improve high school students' process skills. Proceedings of the Biology Education Seminar, 2013, 505–511