



# Implementation of Stop Motion Graphic Animation Video as Learning Media to Improve Students' Ecoliteracy Ability on the Subject Matter of Environmental Change

Rahmatia Karuana<sup>1</sup>, Masra Latjompoh<sup>1\*</sup>, Abubakar Sidik Katili<sup>1</sup>

<sup>1</sup> Department of Biology, State University of Gorontalo, Gorontalo, Indonesia.

Received: December 20, 2022  
Revised: February 13, 2023  
Accepted: February 25, 2023  
Published: February 28, 2023

Corresponding Author:  
Eny Enawaty  
[masralatjompoh@ung.ac.id](mailto:masralatjompoh@ung.ac.id)

© 2023 The Authors. This open access article is distributed under a (CC-BY License)



DOI: [10.29303/jppipa.v9i2.2681](https://doi.org/10.29303/jppipa.v9i2.2681)

**Abstract:** This study aimed to determine the increase in student's ecoliteracy skills through the implementation of stop motion graphic animation video as the learning media on the subject matter of environmental change. In conducting the study, it used the Pre-experiment method in the form of a quasi-experiment, one group pretest-posttest. The results of this study showed that, there was a significant increase in students' ecoliteracy skills obtained in pretest by students before implementing the stop motion graphic animation media as 71.2. Meanwhile, the implementation of it showed an increase as the result of the posttest obtained an increased average value of 90.1. The use of stop motion graphic animation was applicable to be used as one of the learning media in biology. This was because it fostered students' interest in the learning process. Therefore, based on the results of this study, it can be concluded that the stop motion graphic animation video can be used to improve students' ecoliteracy skills significantly.

**Keywords:** Ecoliteracy ability; Learning Media; Stop Motion Graphic Animation Video.

## Introduction

Enjoyable and fun learning is one of the factors that influence students' learning abilities as well as their understanding of the matters. The learning process should then use applicable and better methods in order to create a conducive learning process. Thus, teachers as educators must be able to present interesting learning media so that students can understand the learning matters well. Moreover, in order to run a better learning process, they need to be able to come up with many innovations in learning activities, one of which uses interesting media in the process of it. This is in accordance with the opinion stated by Sari & Setiawan, (2018), which suggests that learning using fun media can attract students' attention and improve their learning outcomes.

However, the learning media used in the subject of biology is still in the form of charts and blackboards with

no other learning media involved. The media that is applied does not consider the relationship between the media and learning materials as it affects each other. As a result, students are less interested in learning, thus, the subject matter presented is not well comprehended by students. Meanwhile, Biology learning as one of the learning branches of science in the learning process studies living things and their relationship with the environment. This can be seen from the learning process, where teachers can connect the material with daily life, namely by making students understand what has been learned. The benefits of learning biology, especially in material regarding the environment, can be obtained if students have the ability to ecoliterate.

One of the subject matters in studying biology under the Basic Competencies (KD) Number 3.11 is analyzing the data of environmental changes, the causes, and their impacts on life. Moreover, in the Basic Competencies (KD) Number 4.11, being able to formulate ideas for solving

## How to Cite:

Karuana, R., Latjompoh, M., & Katili, A.S. (2023). Implementation of Stop Motion Graphic Animation Video as Learning Media to Improve Students' Ecoliteracy Ability on the Subject Matter of Environmental Change. *Jurnal Penelitian Pendidikan IPA*, 9(2), 574-579. <https://doi.org/10.29303/jppipa.v9i2.2681>

environmental problems that occur in the surrounding environment is needed to be done by students. In addition, studying biology, especially regarding environmental issues, the benefit of it can be obtained if students have the ecoliteracy skills. Moreover, according to Azaly & Fitrihidajati, (2021), this matter has characteristics which are related to the environment in everyday life. Hence, it is very significant to improve students' ecoliteracy skills. And it can be done by associating the learning matters with the surrounding environment.

Furthermore, ecoliteracy skill is defined as someone who has the knowledge of ecological principles, attitudes, or behaviors that coexist with nature as a sign that he is environmentally conscious. It is a situation where a person is aware of the importance of the environment (Nurhalisa et al., 2020). In addition, students' ecoliteracy skills are currently limited to them only to recognize basic information, and have not been able to reach the stage of communicating and connecting their skills with science topics (Azaly & Fitrihidajati, 2021). This is in line with the opinion stated by Adela et al., (2018) that in some cases there is still a lack of student awareness in having environmental behavior as well as apathy towards it. This low ecoliteracy skill is caused by the lack of facilities in learning media which affects students in understanding the matter easier.

Eventually, the learning media that can support the learning process is the stop motion animation video. It is a computer/laptop-assisted presentation media made from several pieces of images that become related to one another and combined as if they were moving so that they become animated video (Pangestu, 2021). The videos of the stop motion animation are used to make objects physically changed so that they appear to move. Objects can move because they have various images that are presented regularly and continuously (Arora & Chaudhari, 2021). The use of it as a learning medium can help in studying biology, especially in environmental change subject matter. Due to the use of colors, music, and pictures, the lessons will be more memorable and interesting for students to comprehend. This is then in line with the opinion of Maryanti & Kurniawan, (2018) that stop-motion animation involves the senses of the eyes and ears of students so that information conveyed through video is understood easily.

According to Farrokhnia et al., (2020) video stop motion graphic animation has three main advantages compared to other animations, namely: (1) Students more easily and quickly understand learning materials, (2) Only need simple technology such as LCD and computer/laptop in their use, (3) video stop motion graphic animation is made frame by frame and can be played in slow motion using a computer, So that to understand the underlying concept, students have enough time.

In addition, stop motion graphic animation videos have different ideas from other videos to be more interesting. The difference between stop motion graphic

animation video and video in general is the presence of music, animation and graphics combined so that it attracts attention. In conducting the study, the results of observations and interviews were obtained from MAN 1 Kota Gorontalo. It obtained the data that ecoliteracy skills had not been applied as the learning objective. Thus, the researcher was interested in conducting this study by implementing the video learning media of stop motion animation in order to improve students' ecoliteracy skills through the subject matter of environmental change. It was done as it was a suitable subject matter to be applied to develop the skill of ecoliteracy.

Moreover, related to this study, there are previous studies that have been carried out before. First, a study conducted by (Maryanti & Kurniawan, 2018) entitled "Development of the Stop Motion Animation Video as the Learning Media in Studying Biology using PICPAC Application". Second, a study conducted by (Nugrohadhi & Susilana, 2018), entitled "Effectiveness of Motion Graphic as the Media In Scientific Learning to Improve Learning Outcomes of the Cognitive Domain". Lastly, a study conducted by (Faiqoh et al., 2019) entitled "Characteristics of Developing Learning Media to Strengthen High School Students' Ecoliteracy in the Era of the Industrial Revolution 4.0".

Based on some of these studies, the researcher then conducted a study on "Implementation of Stop Motion Graphic Animation Video as Learning Media to Improve Students' Ecoliteracy Ability on the Subject Matter of Environmental Change" with the aim of discovering students' responses to the implementation of it as well as determining the increase in student ecoliteracy in environmental change matter by using the stop motion animation media.

## Method

This study is quantitative research with pre-experimental methods. It was conducted in September-October 2022, in the 2022/2023 academic year, at MAN 1 Kota Gorontalo. The population in this study were all students of Class X at MAN 1 Kota Gorontalo. Moreover, the sampling technique was done by using Purposive Sampling, which was the sampling technique using a specific purpose without regard to the existing strata. The research sample was class X.3 at MAN 1 Kota Gorontalo, with a total of 20 students. Stages of research implementation in Figure 1.

Furthermore, the design of this study was in the form of A quasi-experiment, one group pretest-posttest to compare the before and after the implementation of stop motion animation as the learning medium. Prior to collecting the data, the research instrument was validated by experts first, then, empirical validity and reliability tests were carried out using the program of SPSS Statistic

version 29. The ecoliteracy skills of the test instrument used 20 questions that were valid and reliable.

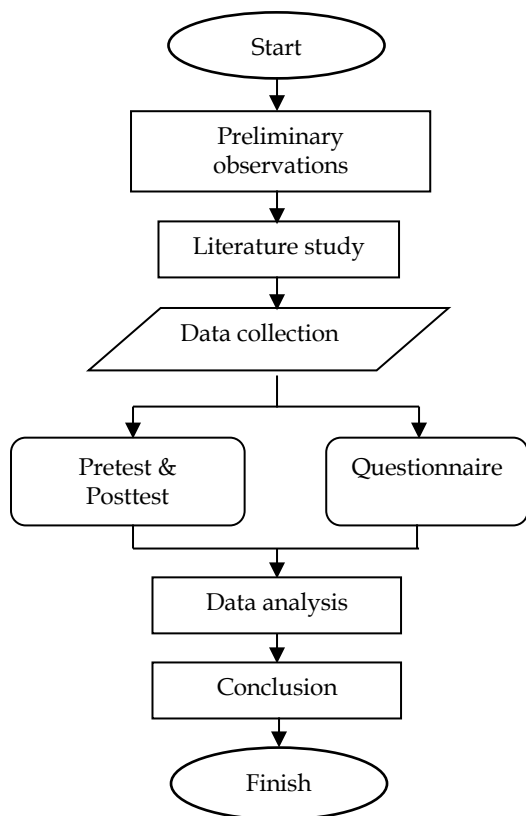


Figure 1. Chart stages of research implementation

Instruments in this study were done using questionnaires, tests and learning implementation sheet. The questionnaire aimed to discover student responses to the stop motion animation video. The tests were used to obtain students' ecoliteracy skills before and after the implementation of stop motion animation. Meanwhile the learning implementation sheet using video media stop motion graphic animation is used to find out the implementation of the learning stages using video stop motion graphic animation. Last but not least, learning implementation data by utilizing the learning media Video Stop Motion Graphic Animation is analyzed by calculating the percentage of the learning stage implementation sheet using the Formula 1:

$$P = F/N \times 100\% \tag{1}$$

(Arikunto, 2009)

Information:

P = Percentage of implementation of learning stages

F = Number of indicators of activities performed

N = Total number of activity indicators

The data that had been obtained were analyzed statistically. Students' response to the questionnaire was

analyzed using the Excel program by calculating the percentage of each statement item. The data on ecoliteracy skill test results were analyzed using the program of SPSS Statistic version 29 by performing a normality test of Shapiro Wilk with a significant value of 0.05. It was done with the aim of knowing whether the data of the pretest and posttest were normally distributed. The homogeneity test of this study was then conducted to discover whether the distribution of the data was homogeneous or not. Moreover, in order to prove the hypothesis as well as to calculate the normality gain value, the t test was done.

## Result and Discussion

The analysis of prerequisite testing was done using the normality and homogeneity test. The results of the normality test of significant value in Pretest of Shapiro Wilk obtained the value of  $0.557 > 0.05$  which meant that the data was normally distributed. On the other hand, the significant value obtained in Posttest was  $0.062 > 0.05$  which meant it was also normally distributed.

Moreover, the homogeneity test results showed a significant value of Pretest and Posttest on the Based on Mean of  $0.06 > 0.05$ . Thus, it can be concluded that the distribution of the data was homogeneous. On the other hand, the paired sample test (hypothesis testing) was carried out after the data were known to be normally distributed and homogeneous. The results of testing the hypothesis obtained a significant value (Two-sided) of pretest and posttest as  $0.01 < 0.05$ . Hence,  $H_0$  was rejected and  $H_a$  was accepted at a significant level of 0.05 which meant that there was a significant increase in the ecoliteracy skill of students using the stop motion graphic animation video media on environmental change subject matter.

Meanwhile, the gain normality test (N-Gain) was carried out after the testing hypothesis was made with the aim of measuring the increase in students' ecoliteracy skills before and after being implemented the stop motion graphic animation. The gain normality test results (N-Gain) in this study obtained the mean value with an interval of  $0.7878 \geq 0.7$ . Thus, it can be concluded that based on the classification of the gain normality value, the value was in the high criteria.

### Description of the Results of the Average Score of Students' Ecoliteracy Skill

The results of the study showed that there were significant differences in the ecoliteracy abilities of students in class X.3. This can be seen in Table 1.

Table 1. Results of pretest and posttest scores of students' ecoliteration ability

Data	Ecoliteration Ability	
	Pretest value	Posttest value
Top rated	86.00	98.00

Lowest value	55.00	83.00
Average value	71.20	90.10

The results of the average score related to the level of achievement of students' ecoliteration ability can be seen in Figure 1.

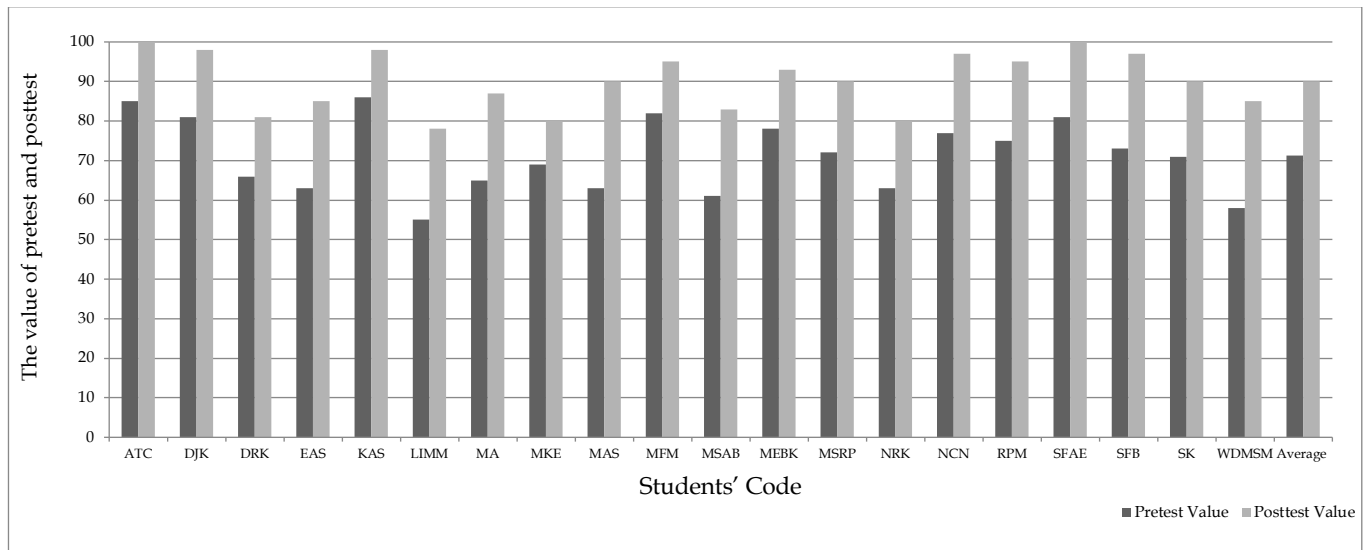


Figure 2. Results of pretest and posttest scores of students' ecoliteration ability

Ecoliteracy is one of the basic sub-literacy of science which is defined as an ability that describes a person's awareness of environmental sustainability. Individuals who have good ecoliteracy skills will have ecological intelligence and think that it is important to have the behavior of caring for the environment and its surroundings. According to Nugraha et al., (2022), ecoliteracy is a person's ability to adapt to respect his environment. Adaptability can be owned by someone through a learning process that shapes knowledge, traits, and attitudes, as well as skills to preserve nature. As stated by Katili (2022), someone who has ecological literacy competence has a high attitude and sensitivity towards himself and his environment in making decisions based on scientific considerations.

One way to improve ecoliteracy is to use interesting learning media. The use of media in the biology learning process will improve students' understanding related to the environment and nature, so that students' ecoliteracy skills can be developed. The learning media that are implemented need to be able to create a fun learning environment for students. This is in accordance with the opinion of Tyas et al., (2021) which suggests that fun learning will have a positive impact on student learning outcomes. Teachers need to apply appropriate learning media in developing students' ecoliteracy skills. This is also supported by the opinion Kastriani, (2019) which suggests that learning needs to be supported by appropriate learning media, and it makes the subject matters conveyed easier to enable students to master the learning objectives.

Furthermore, it is crucial for students to give good responses during the learning process, such as being enthusiastic, paying attention to the material presented, and answering every question given. This is presumably due to the learning process being done using the stop motion animation. In addition to the subject matter contained in the video, there is a combination of animation, music, and graphics that make students interested in paying attention to it. According to Baga et al., (2022), if students are happy with the learning process and understand the lessons, they will then apply it in their daily lives.

This is also supported by the results of the analysis in the percentage of students' responses to questionnaires with the results of 15% of the average percentage, 4.45% of students strongly agree, 5.45% agree, 2.28% lack of agreement, and 2.68 % disagree, and it was based on the positive and negative statements of the questionnaires. Meanwhile, the average student gave a positive response to the learning process using stop motion animation. This is in line with the research conducted by Iktamala, (2017) which states that learning using stop motion animation has a positive impact on the learning atmosphere. Students are more enthusiastic and pay attention to learning material. Therefore, there is a significant increase in learning outcomes when it is done using stop motion animation.

Moreover, during the learning process of ecoliteracy, indicators of achievement start to exist in students. In the aspect of understanding (head), students analyze and provide solutions to environmental problems, as well as assess the impact of their actions on the environment

presented in the applied learning media. According to Desfandi et al., (2017), the ability to solve environmental problems is important to develop because students are the generation that will keep the environment functioning as it should.

The process of solving environmental problems begins with several students responding to environmental pollution presented in learning media, followed by other students identifying the causes or sources of environmental pollution. Therefore, the researcher divided the students into several groups to develop strategies in solving the presented environmental problems. As expressed by Nadiroh (2019), the ability to solve problems has a very significant role in increasing the ecoliteracy skill in the aspect of knowledge and understanding of it.

Furthermore, in the indicators of ecoliteracy's success on the attitude aspect (heart), students show mutual respect for the opinions of others in terms of waste management during the question and answer session, as well as feelings of empathy for the impact of environmental change presented in the learning video. Learning by developing an attitude of empathy, can make students assess and reflect on what they are doing, whether it is good or bad for the environment. This is one of the efforts to build an ecoliterate attitude, according to (Rusmana & Aulia, 2017), of Understand How Nature Sustains Life, where students will feel concerned and realize that the bad effects will occur when the environment is not maintained properly. They will also understand that maintaining the environment is a shared responsibility and that taking good care of it will benefit the environment and vice versa.

This is proven by how students are starting to get used to bringing their own water bottles from home, disposing of trash according to its type, cleaning the classroom before the learning process takes place, and starting to post on social media related to environmental issues. In addition, the class began to design a Clean Friday program which they would include as one of the student council programs and started to get used to turning off the fans in the classroom when not in use. As revealed by (Utina, 2018) that a person must use energy or resources according to his needs and not overuse them. This is then achieved in the ecoliteracy indicator on the behavioral aspect (Hand).

Additionally, the increase in students' ecoliteracy skill is also seen in the results of the pretest and posttest. The average value of students' pretest obtained the value of 71.2, and after its implementation of it, the value increased to 90.1. Therefore, the implementation of Stop Motion Animation on environmental change subject matter is significant and can improve student ecoliteracy skills. Students are able to comprehend the matter and are able to get benefits which can be used in their daily lives.

In short, there needs to be a better learning medium so that students can understand the meaning of ecoliteracy. Through education that is integrated into learning,

students will understand and apply it as the basis for all their actions in nature Nugraha et al., (2022), Those who have ecoliteracy skill can be seen from ecoliteracy indicators in the aspects of understanding, attitude, and behavior. According to Utina (2018), one's understanding of the environment can be seen from several criteria in the form of concern and awareness of nature and the environment, having knowledge of nature and ecological concepts, knowledge of environmental issues, and being able to think critically to find solutions to existing environmental problems. Someone who has an ecological understanding will become a sustainable society that maintains the environment.

## Conclusion

Based on the results of the study, it can be concluded that there was a significant increase in students' ecoliteracy skills after the implementation of stop motion animation in the learning process of environmental change subject matter. This can be proven by the results of the paired sample test as it obtained a significant value (Two-sided) of pretest and posttest of  $0.01 < 0.05$ . Therefore,  $H_0$  was rejected, and  $H_a$  was accepted at a significant level of 0.05. The results showed that students obtained a higher average ecoliteration ability after using learning media than before. Stop motion graphic animation video media is suitable for use in the learning process because it can strengthen student involvement in the learning process and can encourage student learning motivation so that it will help facilitate students' understanding of environmental change material that has a positive impact on students' ecoliteration ability.

## References

- Adela, D., Sukarno, S., & Indriayu, M. (2018). Integration of Environmental Education at the Adiwiyata Program Recipient School in Growing Ecoliteracy of Students. *In International Conference on Teacher Training and Education 2018 (ICTTE 2018)*, 67-71. <https://doi.org/10.2991/icte-18.2018.11>
- Arikunto, S., (2009). *Prosedur Penelitian Suatu Pendekatan Praktik*. Edisi Revisi 6. Jakarta : Rineka Cipta
- Arora, P., & Chaudhari, M. (2021). A Qualitative Study of the Visual Impact of Stop-Motion Animation Films on Its Audience. *International Journal of Modern Agriculture*, 10(2), 936-945. Retrieved from <http://modern-journals.com/index.php/ijma/article/view/803>
- Azaly, Q. R., & Fitrihidajati, H. (2021). Pengembangan Media Pembelajaran Berbasis Microsoft Office Sway pada Materi Perubahan Lingkungan untuk Melatihkan Kemampuan Literasi Sains Siswa Kelas X SMA. *Berkala Ilmiah Pendidikan Biologi (BioEdu)*, 11(1), 218-227. <https://doi.org/10.26740/bioedu.v11n1.p218-227>

- Baga, S., Aqil, D. I., & Rosaline, M. M. (2022). Caricatures and comics based on gender towards concept understanding: A learning media on environmental pollution. *International Electronic Journal of Environmental Education*, 15(1), 134–146. <https://doi.org/10.21009/biosferjpb.25318>
- Desfandi, M., Maryani, E., & Disman. (2017). Building Ecoliteracy Through Adiwiyata Program (Study at Adiwiyata School in Banda Aceh). *Indonesian Journal of Geography*, 49(1), 51–56. <https://doi.org/10.22146/ijg.11230>
- Faiqoh, N., Karyanto, P., & Indrowati, M. (2019). Karakteristik Pengembangan Media Pembelajaran untuk Menguatkan Ekoliterasi Siswa SMA di Era Revolusi Industri 4.0 Characteristics of Learning Media Development to Strengthen Senior High School Students Eco-Literacy in The Industrial Revolution 4.0 Era. *Proceeding Biology Education Conference*, 16(1), 87–93. Retrieved from <https://jurnal.uns.ac.id/prosbi/article/view/38399>
- Farrokhnia, M., Meulenbroeks, R. F. G., & van Joolingen, W. R. (2020). Student-Generated Stop-Motion Animation in Science Classes: a Systematic Literature Review. *Journal of Science Education and Technology*, 29(6), 797–812. <https://doi.org/10.1007/s10956-020-09857-1>
- Iktamala, F. (2017). *Pengaruh Penggunaan Media Video Stop Motion Terhadap Hasil Belajar Siswa Rujchaniyyah Sumberejo Mranggen*. Skripsi. Semarang : Fakultas Ilmu Tarbiyah Dan Keguruan, Universitas Islam Negeri Walisongo.
- Kastriani. (2019). *Efektivitas Penggunaan Media Pembelajaran Video Stop Motion Graphic Animation Terhadap Penguasaan Konsep Dan Minat Belajar Peserta Didik Kelas Viii Mts Izzatul Ma'arif Tappina Kab. Polewali Mandar*. Skripsi. Makassar: Fakultas Tarbiyah Dan Keguruan, UIN Alauddin Makassar.
- Katili. (2022). *Literasi Biodiversitas dan Pembelajarannya*. Gorontalo : Ideas Publishing.
- Maryanti, S., & Kurniawan, D. T. (2018). Pengembangan Media Pembelajaran Video Animasi Stop Motion Untuk Pembelajaran Biologi Dengan Aplikasi Picpac. *Jurnal BIOEDUIN: Program Studi Pendidikan Biologi*, 8(1), 26–33. <https://doi.org/10.15575/bioeduin.v8i1.2922>
- Nadiroh. (2019). Analisis Kemampuan Memecahkan Permasalahan Lingkungan dan Ekoliterasi Siswa. *Parameter: Jurnal Pendidikan Universitas Negeri Jakarta*, 31(2), 96–103. <https://doi.org/10.21009/parameter.312.03>
- Nugraha, R. G., Jalal, F., & Boeriswati, E. (2022). The Urgency Of The Ecoliteracy Module In Improving The Ecoliteracy Ability Of Elementary School Students. *International Conference on Language and Language Teaching*, 43–56. Retrieved from <https://incollt.unipasby.ac.id/proceedings/index.php/incollt/article/view/4>
- Nugrohadhi, F., & Susilana, R. (2018). Efektivitas Penggunaan Media Motion Graphic Pada Pembelajaran Saintifik untuk Meningkatkan Hasil Belajar Domain Kognitif. *Educational Technologia*, 2(1), 45–53. Retrieved from <https://ejournal.upi.edu/index.php/edutechnologia/article/view/19659>
- Nurhalisa, S., Lyesmaya, D., & Nurasih, I. (2020). Analisis Indikator Ecoliteracy Perspektif Goleman Pada Buku Siswa Kelas IV Tema 9 Kayanya Negeriku. *DIKDAS MATAPPA: Jurnal Ilmu Pendidikan Dasar*, 3(2), 272–278. <http://dx.doi.org/10.31100/dikdas.v3i2.738>
- Pangestu, A. R. (2021). Pengembangan Media Pembelajaran Berbasis Video Animasi Stop Motion Pada Mata Pelajaran Geografi. *Geodika: Jurnal Kajian Ilmu Dan Pendidikan Geografi*, 5(2), 216–225. <https://doi.org/10.29408/geodika.v5i2.3807>
- Rusmana, N. E., & Aulia, A. (2017). Pembelajaran Ekoliterasi Berbasis Proyek di Sekolah Dasar. *JESA Jurnal Edukasi Sebelas April*, 1(1), 33–44. Retrieved from <https://ejournal.stkip11april.ac.id/index.php/jesa/article/view/62/49>
- Sari, P. A., & Setiawan, A. (2018). The Development of Internet-Based Economic Learning Media using Moodle Approach. *International Journal of Active Learning*, 3(2), 100–109. Retrieved from <http://journal.unnes.ac.id/nju/index.php/ijal>
- Tyas, D. N., Nurharini, A., Wulandari, D., & Isdaryanti, B. (2021). Peningkatan Kemampuan Ecoliteracy Melalui Inovasi Media Pembelajaran Berbasis Kahoot Games Subtema Pemanfaatan SDA Hayati dan Nonhayati untuk Siswa SD. *Qalam: Jurnal Ilmu Kependidikan*, 10(2), 115–125. Retrieved from <http://ejournal.unsorong.ac.id/index.php/jq/article/view/1548>
- Utina. (2018). *Ekosistem & Sumber Daya Alam Pesisir*. (1st ed., Vol. 53, Issue 9). Yogyakarta :Deepublish Publisher.