

# Increasing Student Ecological Intelligence Through Making Collage Made from Waste

Deden Herdiana Altaftazani

Dept. of Elementary School Teacher Edu.,  
IKIP Siliwangi  
Cimahi, Indonesia  
deden@ikipsiliwangi.ac.id

Galih Dani Septiyan Rahayu

Dept. of Elementary School Teacher Edu.,  
IKIP Siliwangi  
Cimahi, Indonesia  
galih040990@ikipsiliwangi.ac.id

Hana Sakura Putu Arga

Dept. of Elementary School Teacher Edu.,  
IKIP Siliwangi  
Cimahi, Indonesia  
hana-sakura@ikipsiliwangi.ac.id

**Abstract**—The main problem of this research is the low knowledge of students about ecological intelligence in the concern for waste. This problem is caused by a lack of training in waste processing skills. Nowadays there are many ways to process various plastic waste and other non-organic waste into various handicrafts and artworks. The community makes it with various skill techniques into various kinds of objects such as bags, clothes, paintings of three-dimensional objects. This method must always be developed, because it is a creative and innovative way and is able to empower people to have various skills in waste management. One of the skills that can be used in waste processing is to make artwork using collage techniques. Collage is a work of art made from various materials such as paper, cloth, glass, wood, metal, plastic, seeds, dried leaves, which are affixed to the surface of certain images. Plastic waste and other organic wastes can be used as material to make collage artwork. The research method used in this study is a case study method, Data collection techniques carried out in this study were observation and interviews. Based on the results and discussion on the research conclusions of this study, namely: 1) the activity of making collages made from waste can improve the ecological intelligence of students, especially in terms of waste awareness. 2) Collage activities can train students to do waste separation based on their type. 3) Collage activities can train students to be able to recycle waste into something valuable and useful.

**Keywords**—collages, ecological intelligence, waste

## I. INTRODUCTION

Waste is a social problem that has become a difficult problem to overcome. The problem of waste greatly interferes with everyday human activities. Waste can cause the environment to become dirty, damage the beauty of the surrounding environment, cause unpleasant odors, and become a source of various diseases that can disrupt public health. The amount of waste will continue to increase along with the growth of the human population. More and more people will waste more waste. The amount of waste generated from human activities every day is always increasing. If it continues to be allowed, garbage will become something dangerous for the community. Waste will be a source of disease and make the environment look slum. Therefore, there must be processing and recycling of waste so as not to interfere with environmental sustainability and public health.

Based on data from the Directorate of Waste Management of the Ministry of Environment and Forestry (KLHK) national waste production reaches around 65.8 million tons per year, of which 16 percent is plastic waste (Republika.co.id. 2018). With this extraordinary amount of waste, it is certainly a very real threat to the Indonesian people.

From these data, public awareness is needed to help carry out waste management. In fact, according to Nur Rahmawati etc [1] "The garbage that we have just thrown away, it turns out that it can still be reprocessed, among others, in the form of crafts that are of economic value, artistic and unique". Some people are willing to process their own household waste in various ways. There are those who process waste by burning, this method can eliminate waste quickly but it will cause air pollution which of course will cause various health problems. Besides burning, some people also process waste by burying it. This method is also considered to be less effective, because only plastic waste will last long in the soil, so it will pollute the quality of the soil. In addition there are also those who do processing by making compost. But only organic waste can be composted, so other processing methods are needed that can process plastic waste and other non-organic waste without causing various pollution.

At present there are many people who process various plastic waste and other non-organic waste into various handicrafts and artworks. The community makes it with various skill techniques into various kinds of objects such as bags, clothes, paintings of three-dimensional objects, and so on. This method must always be developed, because it is a creative and innovative way and is able to empower people to have various skills in waste management, Goleman [14].

One of the skills that can be used in waste processing is to make artwork using collage techniques. Collage is a work of art made from various materials such as paper, cloth, glass, wood, metal, plastic, seeds, dried leaves, which are affixed to the surface of certain images. Of course plastic waste and other organic wastes can be used as material to make collage art. Through collage activities, researchers will try to increase the awareness of PGSD students in the Siliwangi IKIP about the importance of protecting the environment. Because in this research activity, students will be accustomed to making collage art works but with plastic waste materials and other non-organic waste around the campus. Hopefully, the results of this study can change the paradigm of difficult and unpleasant waste management.

## II. LITERATURE REVIEW

### A. *Ecoliterasi*

Humans live as social beings. Creatures that will always interact with fellow humans, living things, as well as the environment in which they live. Humans and the environment are closely related to each other. Every human action will affect environmental sustainability. Humans must have various behaviors that can preserve the environment. Humans will always carry out various activities to meet socio-economic needs in their lives, then it must be supported by the

availability of resources, Merrill in Azariah [2]. From this opinion, it is clearly illustrated that humans and their environment have very close relationships. Human life will depend on the program they treat their environment.

Basically, ecological awareness has been inherent in humans since ancient times. Humans have long been dependent on nature, humans naturally will have to depend on the resources and ecosystem services that are available in nature, Kim etc [3].

However, as times change so rapidly, awareness about the importance of the environment is decreasing. To increase environmental awareness, the concept of "ecological literacy" or "ecoliteracy" is increasingly being developed and integrated into pedagogical, ecological, and political concepts as an effective approach, Pilgrim etc, [4].

Ecoliteracy comes from two words, eco and literacy. Eco in Greek, oikos in the broadest sense means the universe, the earth where all life lives. Eco is generally interpreted as an environment. While literacy comes from English which means literacy. Ecoliteracy is a situation where people are aware of how important the environment is, Keraf [5]. According to Tamam [6] "ecoliteracy is a way of thinking about the world in terms of natural and interdependent systems including consideration of the consequences of human actions and interactions in natural contexts".

Ecoliteracy is the ability of humans to communicate with the environment and apply ecological concepts to every element of life. Ecoliteracy can be called an understanding of work systems that are done naturally where in social life all interactions occur with natural systems, McBride [7].

Ecology is the study of the relationships and interactions between living things and other living things and their environment. The main unit of ecology is ecosystems, namely a system of life consisting of various types (species) and groups of living things, besides that there are also various non-living elements (physical factors) that carry out various interactions and influence each other. In a system, all elements must go well, when there is interference or damage to some elements will have an impact on the functions of other subsystems, Cunningham [8]. The environment around us must be kept in balance. Because, elements in the life system influence each other. Broken one element will damage the order of other elements, so that it will change.

Ecological intelligence allows humans to apply everything that has been experienced and learned about interactions between humans and ecosystems, Goleman [15]. Ecological intelligence trains humans to exercise their emotions, thoughts and actions in looking at the universe. Ecological intelligence will shape real attitudes and behaviors related to ecological capacity, and give birth to caring attitudes between humans and nature, Hultkrantz in Stenberg [9].

In this study, enhanced ecological intelligence is ecological intelligence in the care of waste. According to Galih & Ruli [10] among others, are as follows:

1. Sort and choose organic and inorganic waste.
2. Prepare organic and inorganic bins.
3. Recycling waste is a useful thing.

## B. Collage

Collage is a two-dimensional work of art. Collages are made by attaching various kinds of objects into a unique and artistic composition of images. Objects that can be attached to making collage artwork are very diverse. Can be made from various types of paper, seeds, dried leaves, plastic, rope, small stones, wood, and so on.

Collage is a two-dimensional work of art made from various kinds of basic materials that can combine and unite together, then form a work that can give rise to an aesthetic value from the maker, Hajar Pamadhi, in Miky et al [11]. In making this artwork, sensitivity, precision and of course the patience of the creator are needed to combine various compositions of the basic ingredients so as to produce a good and beautiful artistic composition. Collage is an art activity with activities attached to materials such as paper, cloth or other objects that are glued to images or patterns, Robins [12].

The activity of making collages can increase the ability of the creator's imagination. Because they are required to imagine a certain composition of images through the incorporation of various basic ingredients naturally and naturally. Because, in collage artworks, it is very rare to find additional colors with paint or crayons. The color produced from collage artwork is usually pure derived from the color of the base material attached.

The ingredients that are the main ingredients in making collages include: natural ingredients (dried banana bark, leaves, dried twigs and flowers, shells, rock), processed materials (colored paper, patchwork, yarn, cotton, plastic ice spoons) creams, drink straws, metals, rubber), used materials (newsprint, used calendars, used magazines, bottle caps, food wrappers). Of the various ingredients, there are several ingredients which are included in organic and inorganic waste, Dewi et al [13].

## III. METHOD

The research method used in this study is a case study method, which is to obtain empirical data when the study was conducted. Case studies can investigate various phenomena in real life if the boundaries between phenomena and contexts are not clearly visible. In addition, case studies can take advantage of various sources of evidence, Robert [16].

The research location to be used is the Siliwangi Teacher Training and Education Institute campus, Cimahi City, West Java Province. The research subjects in this study were the regular class IKIP Siliwangi PGSD students of class 2017.

The collection techniques carried out in this study are as follows :

- a. Observation was carried out by observing students when collecting various waste and making collages made from garbage.
- b. Interviews, conducted randomly to students. Interview questions about understanding ecoliteracy and collage-making activities.

The data obtained from the results of the research are qualitative data. Qualitative data obtained from interviews and observations. This data analysis is carried out in several stages. The first phase of data analysis is data reduction, which is to reduce data that is not important so that the selected data

can be processed to the next step. The second stage is the interpretation of data, namely interpreting the data obtained from the interview and observation process until it reaches the stage of drawing conclusions. Using the Template

After the text edit has been completed, the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper. In this newly created file, highlight all of the contents and import your prepared text file. You are now ready to style your paper; use the scroll down window on the left of the MS Word Formatting toolbar.

#### IV. RESULT AND DISCUSSION

In the early stages of the study carried out initial observation activities related to the ecological intelligence of students in the concern for waste. At this stage interviews were carried out. From the results of this interview, most students did not understand the problem of waste. Most students still dispose of organic and non-organic waste in the same garbage bin. In addition, they also do not know and learn about waste utilization activities.

After conducting the initial observation activities, the researchers began training activities to make collages made from garbage. The waste used is garbage collected around the campus environment of IKIP Siliwangi. The activity begins with the presentation of collage activities and procedures for carrying out these activities. Then the students compile a set of activities and materials that will be used for making collages.

##### A. Sort and Choose Organic and Inorganic Waste

From the results of observations made by researchers, it was seen that students began to learn to do garbage selection. Students collect garbage from the IKIP Siliwangi environment and then divide it into 2 types of garbage. They separate waste into types of organic and inorganic waste. Both types of waste are the main ingredients for making collages. During collage making activities, most students use dried leaves and plastic waste. The rubbish is cut into various sizes, then taped into a new painting.

The researcher tried to dig up the information through interviews, from the results of interviews, there were students who had never done art-making activities using basic waste materials. They are used to the behavior of using everything and then throwing the trash into the trash, without ever thinking of utilizing the unused garbage. Through this activity students have new insights that garbage can be processed to become a work of art with fun activities. All students also feel happy and excited in carrying out these activities.

##### B. Prepare Organic and Inorganic Bins

From the observations made by researchers, students have been able to prepare organic and inorganic bins. As we know, to make collages students need various kinds of garbage as their main ingredient. To collect the waste, students took the initiative to provide organic and inorganic bins that they placed in several corners of the campus.

From the results of interviews conducted by researchers, most students initially did not care about the separation of organic waste. They always dispose of organic and inorganic

waste in the same garbage bin. But with this activity, they understand that waste has different characteristics and must be placed in different places. From this understanding students are moved to provide special bins for organic and inorganic waste.

##### C. Recycling Waste is a Useful Thing

From the results of observations conducted by researchers, it appears that students have been able to make various kinds of collages with basic ingredients of garbage. The garbage that has been collected can be recycled into a useful thing. Rubbish that was once synonymous with dirty impressions and environmental problems, can now be transformed into a beautiful and useful impression.

From the results of interviews conducted by researchers, students feel happy because the collage they produce becomes something beautiful and useful. It is planned that the collages will be displayed in their classrooms, and there are efforts to send the results of the collections to the exhibition of artworks at the IKIP Siliwangi campus.

From the results of these studies, it can be seen that the ecological intelligence of PGSD Siliwangi students in the awareness of waste increases. Of the three indicators observed through observation and interviews, the three indicators increased. Students have been able to sort and choose organic and inorganic waste to be used as the main ingredient in making collages. Then, students have an awareness of the importance of preparing a place for the separation of organic and inorganic waste, because both types of waste have different characteristics and cannot. Finally from this collage activity, students succeeded in making various fine arts made from the garbage they collected around the campus environment. Garbage that was once synonymous with dirty impression, can now be transformed into something beautiful and useful.

#### V. CONCLUSION

Based on the results and discussion on the research that has been described previously the conclusions of this study are 1) The activity of making collages made from waste can improve the ecological intelligence of students, especially in terms of waste awareness. 2) Collage activities can train students to do waste separation based on their type. 3) Collage activities can train students to be able to recycle waste into something valuable and useful.

#### ACKNOWLEDGMENT

The authors are grateful for the opportunities and research funding provided by Ministry of Research, Technology and Higher Education (Kemenristekdikti) through Directorate Research and Community Services (DRPM), Directorate General of Research and Development Strengthening so that research can be carried out and completed as expected.

#### REFERENCES

- [1] N. R. Sulistiyorini, R. S. Darwis and A. S. Gutama, "Partisipasi masyarakat dalam pengelolaan sampah di lingkungan Margaluyu Kelurahan Cicurug," *Social Work Journal*, vol. 5, no. 1, pp. -, 2016.
- [2] J. Azariah, *Ethical Management of Natural Resources*, 2009.

- [3] G. Kim, R. Vaswani, W. Kang, M. Nam and D. Lee, "Enhancing ecoliteracy through traditional ecological knowledge in proverbs," *Sustainability*, vol. 9, no. 7, p. 1182, 2017.
- [4] S. Pilgrim, D. Smith and J. Pretty, "A cross-regional assessment of the factors affecting ecoliteracy: Implications for policy and practice," *Ecol*, vol. 17, no. -, pp. 1742 - 1751, 2007.
- [5] A. S. Keraf, *Filsafat Lingkungan Hidup: Alam Sebagai Sebuah Sistem Kehidupan*, Yogyakarta: PT. Kanisius, 2014.
- [6] B. Tamam, "Peningkatan Ecoliteracy Siswa sebagai Green Consumer Melalui Pemanfaatan Kemasan Produk Konsumsi Dalam Pembelajaran IPS," *Jurnal Pendidikan Ilmu Sosial*, vol. 24, no. 2, pp. -, 2015.
- [7] B. B. McBride, C. A. Brewer, A. R. Berkowitz and W. T. Borrie, "Environmental literacy, ecological literacy, ecoliteracy: What do we mean and how did we get here?," *Ecosphere*, vol. 4, no. 5, pp. 1-20, 2013.
- [8] W. P. Cunningham, *Environmental Science. A Global Concern 7th edition*, New York: McGrawhill Book Co, 2003.
- [9] R. J. Sternberg, *Handbook of Intelligence*, Cambridge: Cambridge University Press, 2004.
- [10] G. D. S. Rahayu and R. Setiyadi, "Penerapan Model Project Citizen dalam Upaya Meningkatkan Kecerdasan Ekologis," *Mimbar Sekolah Dasar*, vol. 5, no. 1, pp. 31-42, 2018.
- [11] C. Miky, M. Syukri and Halida, "Peningkatan Kreativitas Melalui Pembelajaran Kolase Dengan Menggunakan Bahan Alam Pada Anak Usia 5-6 Tahun," FKIP UNTAN, Pontianak, 2012.
- [12] D. Robins, *Belajar Melukis, Tiga Serangkai*: Solo, 2007.
- [13] d. Dewi, "Metode Pemberian Tugas Melalui Kegiatan Kolase Berbantuan Media Alam Untuk Meningkatkan Kemampuan Motorik Halus Anak," *Jurnal Pendidikan Anak Usia Dini*, vol. 2, no. 1, pp. -, 2014.
- [14] D. Goleman, *Ecological Intelligence (Mengungkap Rahasia Di Balik Produk- Produk yang Kita Beli)*, Jakarta: PT Gramedia Pustaka Utama, 2012.
- [15] D. Goleman, *Eco Literate (How Educators Are Cultivating Emotional, Social, and Ecological Intelligence)*, San Fransisco: Jossey-Bass, 2012.
- [16] R. K. Yin, *Studi Kasus. Desain dan Metode*, Jakarta: Rajagrafindo Persada, 2015.