



Utilization of Waste Through Ecoliteration Approaches Based on High-Thinking Skill in Elementary School

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Abstract. The problem of rubbish waste is still a frightening specter for people today, it is seen from the various adverse effects it causes. Starting from the problem of reducing, disposing, and even eliminating waste, to the adverse effects of disasters due to incorrect handling of waste. Basic and sustainable concrete solutions are needed. One of them is by habituating elementary school-age children to handle the waste problem more wisely. The purpose of this study is to explore the implementation of an ecoliteration approach that is combined with high-level thinking skills in handling waste among elementary school students. Students should not only focus on the subject matter in class, but the need for psychomotor habituation, especially in the use of waste. In this case, the process of utilizing waste is integrated into the subjects of Natural Sciences and Cultural Arts and Crafts.

Keywords : Ecoliteration Approach, Higher Order Thinking Skills, Elementary School Students

INTRODUCTION ~ In human life which is always synonymous with consumptive behavior, it is very closely related to the problem of waste. This will certainly affect directly or indirectly on the life of living things. The problem with the use of plastic disposal today is like snowballs, which are getting bigger and bigger and are increasingly difficult to solve. Starting from the habits of the community that can not be separated from the use of plastic materials, to the disposal of used plastic material itself. As is known, plastic is a material that is difficult to decompose, it takes hundreds of years to decompose waste plastic waste naturally. As for some disposal solutions or efforts to reduce waste plastic waste in the form of burning and accumulation of rubbish in a zone or waste disposal spot, not the answer to the problem. That is because these efforts can lead to other problems, such as global warming and environmental pollution. There needs to be an ecosystem balance

in order to preserve the nature that we inhabit.

Ecosystem balance is an ideal condition that needs to be maintained for the sustainability of nature and the living things in it. There will be many adverse things that can arise due to ecosystem imbalances. The impact will certainly attack the survival of living things in the ecosystem. Some things that can be ascertained when an ecosystem imbalance occurs are: the emergence of natural disasters, the extinction of certain living species, and the occurrence of ecosystem anomalies.

In Indonesia, there are many facts that indicate a crisis of environmental sustainability that has a negative impact on other ecosystem components. On November 19, 2018, in Wakatobi was found a whale type of dead Sperm Whale with, 5.9 kg of plastic waste in his stomach. Throughout 2 Km in the waters of the sea of Waha Raya, Wakatobi had



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dives carried out at a depth of 5 to 10 meters and found trash such as nets, diapers, and plastic jars (Wismabrata, 2018). Another thing that is surprising is the vlog that was uploaded on March 3, 2018 by Rich Horner, a British tourist. In the video Rich Horner records himself diving in the sea and around him there appear to be a lot of plastic trash floating following the ocean waves along with the fish that swim here and there (Widyastuti, 2018).

Another adverse effect of the waste disposal problem is the occurrence of floods or landslides which appear to be catastrophic disasters, especially in several regions in Indonesia. These problems need hard and solutive thought efforts from several parties accompanied by concrete actions in its resolution, especially starting from the basic education level.

Teachers and students need to work together in an effort to criticize the problem of waste rubbish, so that the minimum existence of waste rubbish can be reduced, which in turn can avoid floods, landslides and other ecosystem problems. In addition to efforts to make use of non-plastic materials as an alternative to the use of plastic-based materials, to efforts to reduce the presence of waste.

Solutive efforts to reduce waste, for example, can be done by utilizing waste as a basic material for making students' craft crafts. This is certainly one of the ideas that is both brilliant and creative enough to suppress the presence of waste.

The idea or thought of the solution to the utilization of waste is one of the implementations of the results of higher-order thinking skills. There is a lot of involvement in the realm of high-level thinking skills starting from C4-C6 (the stage of thinking analyzing, evaluating and creating) from efforts to reduce waste through utilization into materials for making crafts.

Education regarding the habit of processing waste should be instilled early on. This will become a strong character for the children later if they are accustomed early on. The teacher's turn as an educator is in charge of guiding as well as providing input and advice to students in the effort to utilize the waste.

The effort to utilize the waste can be implemented in learning in schools using ecoliteration approach based on HOTS, which is an effort to study environmental problems by being integrated in each step of learning. Starting from the background above, learning is needed through an ecoliteration approach based on higher-order thinking skills in the effort to utilize waste.

METHOD

The method used is literature study. According to Khatibah (201, p. 38) is a literature study occupies a very important position in research. Although some people distinguish between library research and field research, both of them require library research. Literature research



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according to Nazir (2003, p. 111) explained that library study is a data collection technique by conducting a study of books, literature, notes, and reports relating to the problem being solved.

According to Sugiyono (2012), literature study is a theoretical study, references, and other scientific literature relating to culture, values and norms that develop in a surveyed social situation.

Based on the opinion of some experts, it can be concluded that literature study is an activity with the technique of observing, reading, collecting and analyzing data from various sources such as books, journals, reports, historical records, documents and so forth related to phenomenology.

Cooper in Creswell (2018) suggested that the purpose of literature study is to provide information to readers of the results of other studies relating to the research to be conducted, linking the existing literature, and provide solutions from previous research.

Stages in Literature Review. Conducting research using literature studies must go through the right stages aimed at obtaining efficient and effective results. These stages can guide the initial steps that will be addressed to the final step. According to Creswell the stages of conducting a literature review are:

1) Identifying Key Terms.

2) Determine the place of literature in accordance with the topics that have been found from the database or the internet.

3) Evaluate and critically select literature to study.

4) Compile selected literature.

5) Write a literature review.

Literature sources in this study were obtained from books, journals and research results (thesis, thesis, and dissertation). So that in this study include general processes such as systematically identifying theories, finding libraries, and documenting analyzes that contain information related to the research topic.

RESULTS AND DISCUSSION

The results of the discussion that were examined by the researcher are directly as follows.

a. Ecoliteration

The idea of ecoliteration or in other meaning as an effort to be aware of the environment is now a very serious and emergency concern by the world community. Ecoliteration as a paradigm initiates an environmental awareness movement that aims to increase the ecological awareness of the community (Palmer, 2003; Capra, 1995; and Orr, 1992). The ecoliteration approach seeks to build community understanding on the importance of ecological awareness in order to create a balance between the needs of the community and the ability of the earth to sustain their needs, Capra (1995) argues that the big challenge today



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is building and maintaining a sustainable society. The community is planned so that the way of life, physical structure, economy, and technology does not disturb the balance and ability of nature to sustain their lives. The first attempt is to understand the organizational principles of the ecosystem as the web of life. This understanding is what we commonly call ecological literacy (ecoliteration). Ecological literate people not only respect the environment, but also respect life itself.

Ecoliteracy or often also called ecological intelligence. Derived from the Greek languages oikos (habitat) and logos (science). Ecological intelligence is the ability to adapt to the ecology where we are (Goleman 2010). Critical thinking related to ecoliteration should be started early. The cultivation of environmentally friendly character is an attitude that must be possessed by every individual, especially elementary school students. Individuals who have environmental awareness will be able to balance and adjust development developments with the environment, so as to create a balanced and harmonious environment between the community and the environment. However, the attitude of caring for the environment will not be present automatically, there needs to be recognition and coaching so that these characters can become ingrained in students.

The thinker of the ecoliteration of the philosopher Fritjof Capra, author of the web of life (2001) which subsequently replicated his ideas has a global influence. The idea of ecoliteration then becomes very vital for activists in literacy, especially to refresh the movement of young people in the tradition of pro-environment movement. The great message of the ecoliteration movement is that life is more balanced, harmonious, friendly, and sustainable. The literacy movement must not stop at the ability of the community to absorb text readings and a variety of discourses, but also requires real action to reduce problems faced by the community, for example the use of spilled waste to reduce the volume of waste in the environment.

One of the big problems of modern society is the problem of waste management. The amount of waste every day runs like a series of measurements, while waste management is very slow, like a series of counts. So more and more crowded the human earth with trash and even humans can be buried with garbage. In Jakarta, the Tempo magazine report in the December 2014 edition wrote that the Jakarta community produced 2000 heavy elephants per day. If it cannot be managed, it will become a disaster at any time. Garbage can be an economic commodity, so that humans do not carelessly move trash, just because of egoism for a moment, keep rubbish away from his eyes, but draw closer to the eyes



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of many people by littering in places that make rubbish disturbing, even though it can be useful for actual use valuable and creative.

b. Higher Order Thinking Skills (HOTS)

Higher-order thinking skills (HOTS) are defined as the wider use of the mind to find new challenges. This ability to think at a higher level requires someone to apply new information or prior knowledge and manipulate information to reach possible answers in new situations (Heong et al., 2011).

According to the Ministry of Education and Culture (in Hartati, 2018), the ability higher order thinking skills (HOTS) is triggered by 4 conditions, namely (1) A specific learning situation that requires a specific learning strategy and cannot be used in other learning situations; (2) Intelligence which is no longer seen as an ability that is not changed, but the unity of knowledge that is influenced by various factors consisting of the learning environment, strategies and awareness in learning; (3) Understanding of views that have shifted from unidimensional, linear, hierarchical or spiral towards understanding views to multidimensional and interactive; and (4) More specific higher-order thinking skills such as reasoning, analytical skills, problem solving, and critical and creative thinking skills.

Affandi & Sajidan (2018, p. 1) explained that thinking itself is complex, it involves various forms of intellectual activity. In

thinking many terms used by experts to make clear definitions, but in general there are three terms related to thinking skills, namely complex thinking (Inventive Thinking), inventive thinking (Inventive Thinking) and higher order thinking (Higher Order Thinking). High-level thinking is a cognitive operation that is needed in the thinking processes that occur in short-term memory.

Based on these opinions, it can be concluded that higher order thinking skills (HOTS) are thought processes that do not merely memorize and relay information that is known. The ability to think at a higher level is the ability to connect, manipulate, and transform the knowledge and experience already possessed to think critically and creatively in an effort to determine decisions and solve problems in new situations.

In general, there are several aspects that show a high level of thinking skills (HOTS) possessed by a person, namely the ability to think critically, think creatively, and solve problems. Arifin (2010, p. 185) suggests that critical thinking is an organized process that allows students to evaluate the evidence, assumptions, logic, and language that underlies the thinking of others.

The ability to think creatively abstracted from Thomas, Thorne and Small from the Center for Development and Learning states that creative thinking involves creating, discovering, imagining, guessing, designing, proposing alternatives, creating



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and producing something. Forming a creative idea means coming up with something unusual, new, or come up with a solution to a problem. A person's ability to think creatively can be demonstrated through several indicators, for example being able to propose new ideas, ask questions, dare to experiment and plan strategies.

Critical and creative thinking is used in efforts to solve problems (problem solving). The ability to solve problems owned by someone can be shown through several indicators, for example being able to identify problems, have curiosity, work carefully and be able to evaluate decisions. The ability to think at a high level, whether critical, creative, and problem-solving abilities possessed by a person, cannot be possessed directly but is obtained through practice.

Furthermore, (Arikunto, 2013) also states that there are eight aspects associated with higher-order thinking skills (HOTS), namely:

- 1) Nobody can think perfectly or can't think all the time;
- 2) Remembering something is not the same as thinking about it;
- 3) Remembering something can be done without understanding it;
- 4) Thinking can be realized in words and pictures;

5) There are three types of intelligence and thinking, namely analytical, creative and practical;

6) The three intelligences and ways of thinking are useful in everyday life;

7) Thinking skills can be improved by understanding the processes involved in thinking;

8) Metacognition is a part of higher order thinking.

High-level thinking occurs when someone takes new information and information stored in memory and is reconnected or rearranging and expanding this information to achieve goals or find possible answers in confusing situations.

c. Implementation of an Ecoliteration Approach based on Higher Order Thinking Skills (HOTS) in the Utilization of Waste.

Goleman, et al. (Rusmana Neri Egi and Aulia Akbar, p. 3, 2017) put forward five points for developing an attitude of ecoliteration as follows:

- 1) Develop Empathy for All Forms of Life

Learning must focus towards awareness, empathy attitude towards the environment to students. Basically every child has a keen on the environment. This attitude can be seen when students feel sorry for living things when they are hurt. This empathy attitude must be developed by the teacher in the class so that the empathy of students is getting stronger. Through this sustainable practice, children



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can assess and reflect on what they are doing is good or bad for the environment.

b) Embrace Sustainability as A Community Practice

Learning in groups needs to be done by students, so students can ask questions with their group friends. In addition, practical learning in groups can foster individual enjoyment of students and can foster a sense of responsibility towards the task and other group members. Students will understand how environmental sustainability is the responsibility of every individual including students.

c) Make the invisible visible

Real learning is really needed by students. Students will be closer and animate every learning process. They carefully follow the steps and procedures in activities. So they will feel what is the goal of learning. This will make learning more meaningful. Students can experience firsthand how learning takes care of the environment.

d) Anticipate Unintended Consequences

This stage will teach students to take full responsibility for their work. There will be consequences that occur if students underestimate their work in the learning process. Mistakes that occur in teaching learning activities or processes teach students the need for cooperation and consistency in their assignments. Mismatch of expectations with reality is what students will find, so students can evaluate how the activity should be carried out.

e) Understand How Nature Sustains Life

This activity will bring students into the evaluation stage directly. Students will realize the effects that occur when the environment is not well maintained. Understand that life is the responsibility of humans who manage it. Good management will have a good effect on the environment and vice versa. This will provide a special experience for students.

The ecoliteration approach can be specifically implemented in learning in primary schools. Can also be integrated with other variables that support and strengthen, so that the objectives to be achieved can be fulfilled. In this study in particular the integration of high-level thinking skills with an ecoliteration approach in learning in primary schools can be pursued in the activities of utilizing waste by students.

It is sought to start from the problem of rubbish that is difficult to overcome, which later if left unchecked will have a direct or indirect impact on the environment in which humans live.

Learning by implementing an ecoliteration approach based on higher order thinking skills should be done at various levels, especially in high grades in elementary schools. This is possible because the HOT-based ecoliteration approach is directly related to phenomena or the environment directly.

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High-level thinking skills learning has an operational sense as a learning approach that involves more specific high-mindedness abilities such as the ability to analyze, evaluate and create (Hikamudin, p. 53, 2019)

The concept of ecoliteration learning based on high-level thinking skills in waste utilization activities refers to the realm of cognition 3-6 namely the realm of analytical thinking, evaluating and creating. In more detail can be observed in the following description.

1) In the realm of analysis, students are confronted with general waste material in the environment around the school, both organic and non-organic waste. The implementation of learning can be activated by the activities of students analyzing which waste can be used in making crafts. At this stage of

the activity, students are allowed to study at the same time sort out potential, high-value, and economical materials that can be utilized in making crafts.

2) In the realm of evaluation, students are faced with efforts to assess the good or bad, and decide on the next steps after the selection of selected plastic waste materials that are suitable to be used as crafts.

3) In the realm of creating, students are faced with challenges to design, design, then create a work from selected plastic waste materials. In this realm, students should be able to pour the broadest possible creative mind, so as to create optimal and more valuable work.



Figure 1. Student Craft Results from Waste 1



Figure 2. Student Craft Results from Waste 2



Figure 3. Student Craft Results from Waste 3

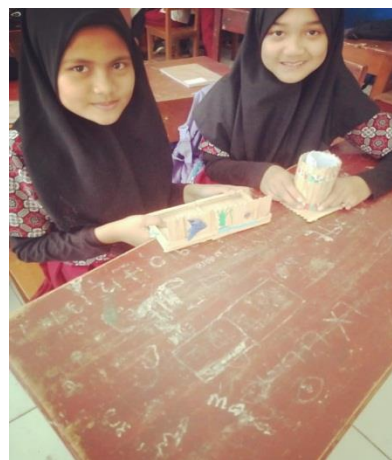


Figure 4. Student Craft Results from Waste 4

CONCLUSION

From the results of the analysis and data

synthesis, it can be concluded that
based on the discussion above,



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ecoliteration is a process of increasing understanding, knowledge, attitude and behavior based on ecology. Ecoliteration seeks to introduce and renew one's understanding of the importance of global ecological awareness, in order to create a balance between the needs of society and the ability of the earth to sustain it.

Attention to environmental damage generates thoughts on the implementation of sustainable development in the 21st century through the delivery of education that is integrated with environmental problems or is called environmental-based education. The implementation of environment-based education can be integrated one of them through the Natural Sciences and Cultural Arts and Crafts because it becomes one of the vehicles in moral education, character, and creativity developers as well as carrying out the mission, values and attitudes in three domains namely the cognitive domain, affective domain, and psychomotor domain to achieve instructional goals and accompaniment goals at the same time, with the hope of forming an awareness of protecting and preserving the environment.

Ecoliteration has positive learning objectives and pedagogical aspects to be applied in a variety of learning, especially science and SBdP in schools. The integration of ecoliteration with HOTS

in learning leads to the achievement of the mental environment of students. In addition, this learning design is certainly categorized as High Order Thinking Learning (HOTS) because it is designed in a learning strategy that guides students to construct their cognition, affection, and psychomotor.

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