Implementation Zero Waste Habits at Vocational School

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Abstract. Waste is a major problem in society, the issue about waste is big global issues. Increasing population means increasing waste produced. The lack awareness of waste management makes the environment worse. This problem can't be solved by government only, but this problem required collaboration of the whole member of society to care more about their environment. Zero waste is one of sustainable development goals (SDGs) point. The simple way to reduce waste in our daily activities is using foods containers and drinking bottle wherever we go. Students are part of society who should be play an active role in waste management. This study aims to implement zero waste habits at school. The method of this study is descriptive, instrument used in this study are questionnaire and self-assessment. Participants involved in this study were 50 students at class X high school in Bandung Regency. Based on the result of study, student habits have changed for decreasing waste at school about 77,5%. Students has a great experience from this study to gain skill in making ecoenzymes and compost from organic waste.

Keywords: Ecoenzyme, Environment, Sustainable Development Goals (SDGs), Waste, Zero Waste.

1 Introduction

Waste is everything which are no longer useful, waste can also be interpreted as residue of daily human activities [1-5]. Waste is remaining from human activities [6]. Society activities and waste produced is a unity, almost people activities will produce a waste [7]. The relation between population growth with increased waste. According to Worldmeters's data the world population till July 2023 is around 8,05 billion and Indonesia is ranked fourth as the largest population country in the world [8]. The correlation between population growth with waste produce, result of his study explains that the more population the more waste produce by.

The increasing volume of waste influenced by life style [9-10]. Lifestyle changes have a big influence on high waste production, the ease of online shopping for various things including junk food it's contributes to increase volume of waste produced by society [11]. In big city online shopping nowday has become a culture. This contributes to an increase in waste production because every itmes sent uses plastic packaging, the more people buy, the more waste is generated.

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Waste will be generated more than 6 million tonnes a day in 2025 [12]. Increasing the volume of waste will cause serious environmental damage if it is not handled propely. This is in line with opinion which state that waste is one of the biggest factors causing environmental damage [13]. Therefore, waste management needs to be handled properly, because if it isn't implemented the environment will suffer serious damage. Enviromental damage will affect various aspect of human life, one of it is a health aspect [14].

Zero waste is one of sustainable method of waste management that can be implemented by everyone because everyone has the responsibility to manage waste, especially waste produced by themselves [15]. Zero waste focuses on processing waste in a sustainable design without landfill or incineration, because the basic principle of zero waste is a preventive effort to minimize waste production [16].

At the summit was held in New York on 25th September 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development which contained 17 Sustainable Development Goals (SDGs). The SDGs in an inclusive way describe development challenges for all world communities. The goal of the 17 SDGs is to ensure a sustainable, peaceful, prosperous and just life on earth for all people now and in the future [17]. Zero waste is one part of the SDGs point namely climate change, cause waste management has a large contribution to climate change. Implementation zero waste habit at vocational school is expected to have positive impact on reducing plastic waste.

Student as a young people need knowledge, skills, values and attitudes that empower them to contribute to sustainable development. Therefore, education is very important for achieving sustainable development [18]. The same thing that students are expected to be able to contribute to community and support natural resource management [19]. Students are part of society who must play an active role in waste management through implementing zero waste in the school. The previous research relevant is [20-22]. Based on description above, the author conducted research on Implementation of Zero Waste Habits at Vocational School

2 Method

The research conducted was quantitative with a descriptive design. The sampling technique used was purposive. The subject in this research were 50 they are student of class X who are studying natural science. The instruments used in this research are self-assesssment and questionnaires. Self-assessment are given to measure his discipline in reducing plastic waste by bring a food containers and drinking bottles, beside that self-assessment used to know how much waste that has produced in a day and also we can know the reasons if one day some of them not bring it to the school. Questionnaire used to measure the student respons in implementing zero waste by makes ecoenzyme. Purpose of descriptive design [23] is to create systematic, factual, and accurate descriptions, images or paintings regarding the properties, facts and relationship between the phenomena being investigated.

The research was conducted for two months. At the beginning of learning activity students are given an explanation about the goals of natural science subject is they are can give a positive contribution to protecting environment from damage. The simply thing to make it real is student can reduce waste by using foods containers and drinking botlles. In the next learning activity for two months the students carried out self-assessments regarding the waste they produce every day and collect organic waste from their house. At the last week students makes ecoenzyme and compost from the organic waste they have collected.

3 Results and Discussion

3.1 Habits Changes

Result of the research was found about the changes waste production habits of the students, especially plastic waste production. Habits form through repetition of behaviour in specific contex [24]. Before treatment almost of student never bring food containers and drinking bottle to the school it means a lot of plastic waste is produced. Ussualy, a student can produce 6-10 pieces of plastic waste a day. When students are given treatment to use their own foods containers when buying foods at the canteen, the waste produced by each student is only 1-2 pieces a day.

In the first week, several students were treated not bring foods containers and drink bottle because some of them felt embbrased and forget. As time goes by, students are starting to get changes habit of using foods containners at schools as a step towards implementing zero waste in the school. Reducing of plastic waste with a treatment can be seen in the table below:

Table 1. Rate of Plastic Waste Produced by Each Students a Day

A Rate of Plastic Waste Produced by Each Students a Day							
1st Week	2nd Week	3rd Week	4th Week	5th Week	6th Week	7th Week	8th Week
250 pieces	240 pieces	225 pieces	150 pieces	100 pieces	76 5pieces	45 pieces	23pieces

Based on data above the plastic waste produces was changes about 77,5%. Plastic is the biggest waste that destructive to the the earth [25]. Reducing plastic waste is one simple step to protect the earth, this point also is intergrated with one of the SDGs points.

After two months, student was no longer given self-assesment nor questionnaires, but researchers were monitoring whether their zero waste habits were still being implemented or not. Based on researcher's observations, till the end of the semester students were still implementing zero waste even though they were not given an assessment. Therefore, it can be concluded that good habits can be formed by observation.

3.2 Students Responses About Organic Waste Processing

Food waste is the largest organic waste produced everyday. Organic waste disposal in landfills has created various environmental issues, such as greenhouse gas emissions and leachate [26]. The awareness of environmental issues has encouraged society to find other alternatives to manage the organic waste disposal process instead of landfills. The composting process can be used for biological decomposition, and this technology has the potential to manage organic waste, transform it into valuable agricultural products, and minimize pollution [27-29].

To achieve one of goals of learning natural science to save the earth in the part of the research students get experience to make ecoenzyme and compost from organic waste. Manufacture of ecoenzyme and compost from the organic waste aims to introduce students how to process organic waste into something is more useful and has selling value, not all waste is useless because some of it can be processed into something useful.

Students makes ecoenzyme and compost from waste organic that has collected from tehir home. Their responses about organic waste processing were measured using questionnaires. Their respon is good because they haven't got the experience before. Waste management in Indonesia is relatively low, so makes ecoenzyme and compost is an economical alternative that can be done [30]. Organic waste processing can be seen in Fig. 1.

Fig. 1. Ecoenzyme Making by Student

Fig. 2. Compost Making by Student

4 Conclusion

The conclusion of the research is student habits of produced waste can be changed with a treatment at some a month. Students has good respons of implementation zero waste habits, at makes ecoenzyme and compost from organic waste.

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