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Life Skill Education in Waste Management: Enhancement of Empowerment-Based Skills for Densely Populated Residential Communities

Andika Pratama^{1*}, Nunu Heryanto¹, Joni Rahmat Pramudia¹, Maya Lestari², Rahmat Fahmi¹

¹ Community Education Department, Universitas Pendidikan Indonesia, Bandung, Indonesia

² Early Childhood Education Department, Universitas Pendidikan Indonesia, Bandung, Indonesia

Abstract: Waste is a problem that is still quite difficult to overcome, especially in a country with a large population, including Indonesia. Therefore, this study aims to analyze the solution to the waste problem through life skills education by increasing empowerment-based skills in densely populated settlements that are usually the largest source of waste producers. This research was conducted in Cibunut, Bandung City, West Java Province, Indonesia using an exploration method and analyzed with a qualitative approach. The sampling technique is purposive sampling with several criteria. Namely, the sample is the participant of the activity, the sample of the program implementer, and the sample represents the actual population. The novelty of this research is to develop theoretical concepts of effective decision-making life skills, namely 1) critical thinking, 2) creative thinking, 3) problem solving, 4) decision making, and three aspects of empowerment, namely institutional aspects, economic aspects, and socio-cultural aspects. The results showed that the Cibunut settlement community had succeeded in turning their settlements into a waste-free area. In addition, they can turn waste into something valuable and handicrafts that can be sold. The bottom-up approach is an effective solution in the implementation of empowerment-based life skills education. The entire community's involvement in the entire life skills education process is the key to sustainable empowerment.

Keywords: waste, life skills education, empowerment.

废物管理中的生活技能教育：为人口稠密的住宅社区增强基于赋权的技能

摘要: 浪费是一个仍然很难克服的问题，尤其是在印度尼西亚这样一个人口众多的国家。因此，本研究旨在通过在人口稠密的定居点（通常是废物产生的最大来源）中增加基于赋权的技能，通过生活技能教育来分析废物问题的解决方案。这项研究是在印度尼西亚西爪哇省首府万隆市的西布努特，万隆使用勘探方法进行的，并使用定性方法进行分析。抽样技术是有几个标准的有目的的抽样，即样本是活动的参与者，计划实施者的样本和样本代表实际人口。本研究采用并发展了有效决策生活技能的理论概念，即 1) 批判性思维，2) 创造性思维，3) 解决问题，4) 决策，以及授权的三个方面，即制度方面、经济方面、和社会文化方面。结果表明，西布努特定居点社区成功地将他们的定居点变成了无废物区。此外，他们能够将废物变成有价值的东西和可以出售的手工艺品。自下而上的方法是实施基于赋权的生活技能教育的有效解决方案。整个社区参与整个生活技能教育过程是可持续赋权成功的关键

关键词： 浪费，生活技能教育，赋权。

1. Introduction

Waste is still a problem that is quite difficult to handle until now, especially in areas that the central

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About the authors: Andika Pratama, Nunu Heryanto, Joni Rahmat Pramudia, Community Education Department, Universitas Pendidikan Indonesia, Bandung, Indonesia; Maya Lestari, Early Childhood Education Department, Universitas Pendidikan Indonesia, Bandung, Indonesia; Rahmat Fahmi, Community Education Department, Universitas Pendidikan Indonesia, Bandung, Indonesia

government does not touch. The government has made many efforts to deal with waste; one of the efforts to overcome the waste problem is to increase the community's independence and ability to manage waste to empower the community [1]. According to the World Health Organization (WHO) definition, waste is not used, not liked, or something is thrown away that comes from human activities and does not occur by itself. The waste problem is currently difficult to handle, especially in developing countries such as Indonesia [2]. The amount of waste from people in Indonesia who still do not understand how to recycle waste, establish a bank sample (independent waste management), and dispose of this waste. The low awareness of the community in managing waste makes this problem worse [3].

Problems that often arise in waste management are high operational costs and finding adequate disposal sites. Due to high operational costs, most regions in Indonesia can only charge a processing fee of 60% of all waste generated. On the other hand, waste can also cause disease if it is not managed properly and appropriately. To reduce these negative impacts, the community must improve the quality of environmental hygiene, especially the environment [4]. Household waste, especially plastic waste, threatens ecosystems, the environment, and wildlife [5]. Even after forty years, the problem of plastic waste has recently become a worrying focus: scientific reports show widespread plastic pollution everywhere in the world's oceans, featuring photographs of plastic-filled seabirds and marine mammals entangled in plastic waste [6]. According to the Indonesian Ministry of Environment and Forestry (KLHK) admits that in 2020 the total national waste production has reach 67.8 million tons. It means that 270 million people generate around 185,753 tons of waste every day, or each resident produces about 0.68 kilograms of waste per day. This figure has increased compared to previous years.

According to Indonesian Law Number 18 of 2008 concerning Waste Management, waste is the residue of daily human activities or natural processes in the form of solid or semi-solid in the form of organic or inorganic substances that can be decomposed or cannot be decomposed and it is biodegradably considered useless and discarded to the environment. When viewed from the source, waste comes from various places: 1) Waste from residential areas. Usually, a family living in a building or a dormitory generates waste. The waste produced is usually organic, such as food scraps or wet, dry, plastic ash, etc. 2) Waste from public facilities and trade in public places is where many people gather and carry out activities. These places have considerable potential in generating waste, including trading places such as shops and traditional markets. The types of waste produced are generally food scraps, rotten vegetables and fruit, dry waste, ash, plastic, paper, cans, and other waste.

In 2018, the national waste production in Indonesia reached 64 million tons from 267 million people. In the end, this waste has contributed greatly to the increasing accumulation of piles in landfills (TPA). The dense population and limited land make it difficult for waste to be properly disposed of. The ignorance and indifference of the community are also the reason why waste continues to accumulate in every corner of the city without proper management. Household waste is an example of waste with a very large level of pollution. The presence of waste can cause soil and water pollution, cause unpleasant odors, and become a shelter for diseases that can interfere with the health and beauty of the environment [7]. The problem of waste is no longer just a problem of cleanliness and the environment but has become a social problem that can cause conflict in the community.

Furthermore, cities in Indonesia have similarities in waste management, namely the method that starts from collecting, transporting, and then disposing of which is a classic method that is less effective [8]. With various things like that, this will be a complicated problem for people living in densely populated settlements because waste production increases with population growth [9]. Most sanitation and waste management, especially in densely populated settlements, is still lacking, so an effective and integrated waste management system is needed. This can be addressed by developing integrated waste management policies, strategies, and plans and providing support through appropriate legislative and institutional frameworks [8, 10, 11].

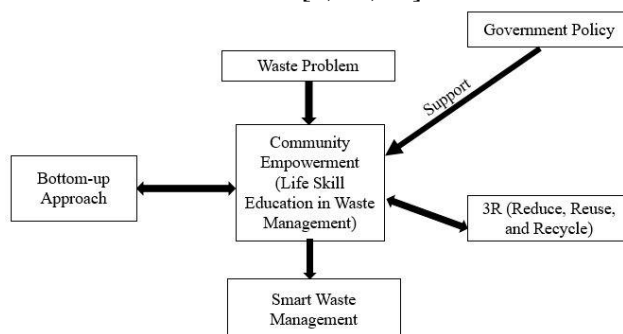


Fig. 1 Smart waste management concept

With these various problems, there is a solution to dealing with this. The solution is life skill education based on community empowerment. Life skills education does not change an education system and does not reduce education, but life skills education aims to provide skills and opportunities for all individuals to increase their potential, which can be used as a source of income [12]. Furthermore, if it is associated with empowerment, actually empowerment is a process of giving and optimizing power (which is owned or can be utilized by the community), both power in the sense of “ability and courage” and power in the sense of “power or bargaining position” [11].

Densely populated settlements and waste that accumulate from a broad aspect are great potentials that

can be utilized to create life skill education by managing the waste. Nevertheless, the government is not yet an optimal empowerment program in waste management, which has made this waste problem unresolved. Further Empowerment-based life skills education programs that are carried out in a top-down approach are not very effective because they are only incidental, especially if there is no good coordination between community institutions and the government [11]. Implementing life skills education based on more effective community empowerment is a program made with a bottom-up approach. The community and environmentalists collaborate with various stakeholders to create integrated and usable waste management [13]. In addition, education will be even better by utilizing the potential of social capital, development programs, and life skills [14].

With various problems and theoretical concepts that have been explained, this study seeks to explain life skills education in waste management. Effective and sustainable skills improvement will greatly help overcome the waste problem, especially in densely populated settlements. Many studies discuss how to manage waste properly, including research with sustainable waste management practices, an integrated approach to find the causal effect of waste management on sustainability in organizations, waste management with informal recyclers, e-waste management systems, and management. Practice and modeling of seasonal variations in health care waste [15-19]. However, very few studies have addressed utilizing social capital such as social and waste itself through life skills education, so further research is urgently needed.

This article discusses life skills education in managing waste through empowerment-based skills improvement in densely populated settlements. This research was conducted in the waste-free area of Cibunut, Bandung City, West Java Province, Indonesia. This waste-free area has a non-governmental organization called KSM Oh Darling. KSM Oh Darling stands for great people who care about the environment (*Orang Hebat saDAR LINGkungan*). This institution is in charge of implementing education programs and empowerment of life skills. This area has implemented life skills education on an ongoing basis in managing waste in densely populated residential areas.

2. Research Methodology

2.1. Research Design

This study used an experimental method and was analyzed with a qualitative approach. The sampling technique in this research method is non-probability sampling using a purposive sampling technique with several criteria. Namely, the sample is the participant of the activity, the program implementer, and the sample is representative of the actual population. This study adopts and develops the theoretical concept of life

skills of effective decision making, namely 1) critical thinking, 2) creative thinking, 3) problem solving, 4) decision making [20], and three aspects of empowerment, namely institutional aspects, economic aspects, and socio-cultural aspects [14]. The research was conducted in a waste-free area that has carried out life skills education and sustainable empowerment for its community. Methods of data collection using observation and interview techniques. Empowerment experts, environment experts, and life skills education teachers validated the question sheets.

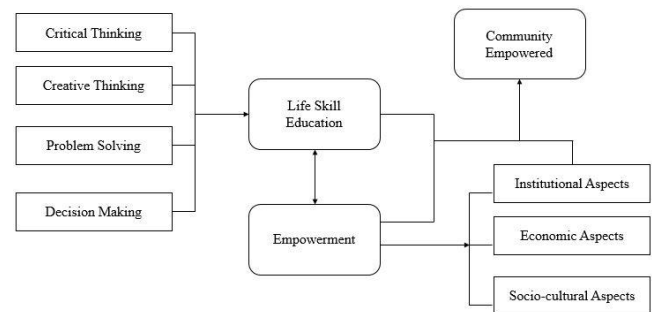


Fig. 2 The concept of life skills education and three aspects of empowerment

2.2. Subjects

The subjects involved in this study were six respondents in the Cibunut waste-free area, Bandung city, West Java province, Indonesia. Respondents have been selected according to predetermined criteria. 2 respondents are managers of the KSM Oh Darling Cibunut, two respondents have attended life skills education in managing waste, and two respondents are people who live in waste-free areas have never participated in a life skills education program there. All respondents in this study used the initials Res 1-6. Their ages ranged from 18-60 years. The election was based on observations on waste-free areas in Bandung City and recommendations from the community and institutional administrators.

3. Results and Discussion

Life skills education in managing waste is very important for countries that are still experiencing problems related to waste management. Furthermore, this waste problem often arises from densely populated settlements because of household waste and inadequate waste disposal facilities. This study seeks to reveal densely populated settlements that have empowered their communities and turned their homes into waste-free areas that can manage waste properly. Based on observations in a waste-free area, organic waste is collected at one collection point and then made into compost, then non-organic waste such as used newspaper, canned drinks, and plastic cups are made into handicraft products such as bags, flowerpots, wall decoration, etc.

3.1. The Beginning of Life Skills Education in Managing Waste

Cibunut Village in Bandung City was originally a densely populated settlement in general, with an area of 31,478 m² and a population of around 1850 people. This settlement was once a slum settlement where much waste was scattered on the sidewalks, waterways, and roads. Some people aware of maintaining cleanliness have started to care about the environment and collect garbage but do not know how to manage the waste. All they do is bury and burn the waste. Finally, in April 2015 came a woman who is a facilitator in environmental management. For some time, she only made observations without communicating with the community in the area, as stated by the following respondents:

Res 3: The woman only observed our place at least once a week for about three months without talking about her purpose of coming.

After three months, the woman just explained that her name is Mrs. Tini, she is an environmentalist. The purpose of his visit was to make a mapping of Cibunut village, to see who the influential community leaders were and what trouble makers were in that place. After that, the woman approached the mothers and children to get closer to the people there. The woman used the habit of the community doing community service on the weekends to discuss with the community there to create a life skills education program in managing waste that involved the entire community in the area. At first, the people in Cibunut village were still confused about what to do, but finally, they agreed to invite waste management experts to train them in managing waste. After several months, they were finally able to manage their waste.

Furthermore, the people in the area thought of a very extraordinary idea. They want to make nature tourism, namely tourism, in a waste-free area. Finally, community leaders and the Cibunut community created colorful villages in nine colors in nine different locations. Until now, Cibunut village has become an example of a waste-free area that can empower its people in sustainably managing waste. Even many institutions engaged in waste management have learned about life skills education based on community empowerment in Cibunut.

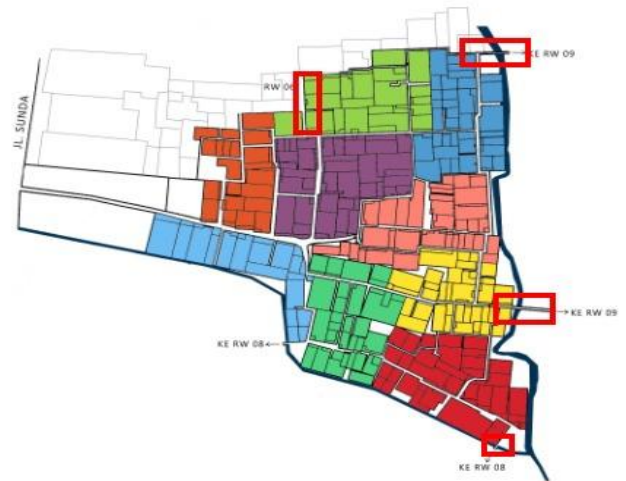


Fig. 3 Cibunut map with nine colors in nine different locations

3.2. Critical Thinking to Solve Waste Problems

Critical thinking is part of life skills education. Critical thinking is a democratic necessity, an invaluable career readiness skill, and a major learning outcome of science education. Furthermore, critical thinking can be interpreted as a complex process and, if done correctly, will help in systematically reviewing complex ideas so that problems become easier to solve [21, 22]. Mrs. Tini and the community came up with an extraordinary idea to overcome the waste problem in densely populated settlements in Cibunut village. Their settlements that used to be slums and lots of waste everywhere have become a beautiful waste-free area tour with various colors. In addition, the KSM Oh Darling institution manager also has an idea that is very useful for many people, namely sorting organic and non-organic waste as expressed by the following respondents:

Res 2: The managers KSM of Oh Darling invite discussions and involve the whole community to carry out a waste sorting movement, which can be used as various useful things.

Through a waste management pattern that involves the community, the entire community will have high knowledge and awareness in managing waste to be widely disseminated to other communities.

3.3. Creative Thinking to Turn Waste into Handicrafts and Organic Fertilizer

Creative thinking is a fundamental skill that must be possessed in life skills education. Creative thinking aims to identify the problem, then interpret and analyze it and turn it useful [23]. Since the idea of a waste-free area in the densely populated residential area of Cibunut, the community and the management of KSM Oh Darling have continued to improve their skills in managing waste, finally, in each house, biopori was installed to put organic waste, or it could also be collected to be used as organic fertilizer. For non-organic waste, the people in the area used drink cans

and used cans to be used as craft materials as expressed by the following respondents:

Res 6: Since our settlement became one of the pilot waste-free areas, we have become more and more diligent in making handicrafts from waste materials, and our products are sold in online marketplaces and traditional markets.

The waste-free area in Cibunut village, Bandung city, West Java province, Indonesia, is one of the densely populated settlements that used to be slums but turned into very clean settlements, and the people are very creative in managing organic-inorganic waste.

3.4. Problem Solving

Problem-solving skills are an important part of life skills education. Problem-solving can be interpreted as an approach with problem identification, which is then analyzed based on accurate data and information until it reaches the next comprehensive stage to solve the problem [24]. The problems that exist in the densely populated residential area of Cibunut and the very large number of residents are also waste scattered on the road and filling the river so that it emits an unpleasant odor. The problems experienced by the Cibunut people have made them and the people who care about the environment initiated by Mrs. Tini finally create a waste-free area in utilizing waste as stated by the following respondents:

Res 1: Since our settlement turned into a waste-free area, our environment has become cleaner, waste is no longer on the streets, and the river flows smoothly, so it does not cause flooding.

The problem-solving abilities possessed by the Cibunut settlement community, which is part of life skills education, can make their settlements a clean, beautiful, and comfortable settlement.

3.5. Institutional Aspects in the Cibunut Waste-Free Area

Structured institutions are a very important aspect so that empowerment can be carried out sustainably. Strong institutions will make the institution's goals can be achieved optimally, institutional and human resource development can be done by strengthening the entrepreneurial spirit, building institutional governance, improving security systems, increasing human resource competencies, and increasing public awareness strategies [25]. The institutional aspect of KSM Oh Darling in the Cibunut waste-free area is one example of a non-governmental organization that has successfully carried out community empowerment in a sustainable manner by involving all the people in the settlement. The KSM Oh Darling institution always invites the public to discuss in deciding a regulation so that the regulation is realized by mutual agreement as stated below:

Res 3: We, as administrators of the KSM Oh Darling institution, always try to involve the

community in deliberation in making decisions so that no people in this settlement feel objected to.

Res 5: I am one of the people who is always involved in making institutional governance so that the KSM Oh Darling institution is transparent for me.

Institutional aspects are very important for the sustainability of empowerment-based life skills education. An institution that always involves its members will become a strong institution to achieve its goals optimally.

3.6. Economic Aspects of Cibunut Densely Populated Settlements

Economic factors are one of the main indicators of community welfare because the higher the income, the better the welfare of the community [26]. The densely populated settlement of Cibunut is a community with a variety of occupations, some working as drivers, factory workers, teachers, artisans, traders, etc. However, since creating a waste-free zone program for the settlements, their economic income has increased. The arrival of tourists to the waste-free area allows people to sell handicrafts from non-organic waste. Then they can sell fertilizer from organic waste to farmers who need fertilizer, as revealed by the following respondents:

Res 4: Since our settlement has become a waste-free tourism area, our income has increased from the results of managing waste

Furthermore, people who are very busy and do not want to bother only collect waste, which will then be weighed and recorded to exchange the amount of collected waste for money at the appointed time. Empowerment-based life skills education in densely populated settlements has successfully empowered the community by utilizing waste as a source of income and making the environment clean.

3.7. Socio-Cultural Aspects

The socio-cultural aspect is an important aspect in empowerment-based life skills education. Socio-cultural values are everything humans create that arises from their thoughts and social life and interactions between one individual and others [27]. One of the socio-cultural values that began to emerge since implementing the Cibunut waste-free area program is cooperation. Through cooperation, strong community cooperation will affect the community's ability to find and solve existing problems and accelerate economic development, and community participation in development becomes more optimal [14]. Since the Cibunut settlement has become a waste-free area, most people have a sense of responsibility to keep their homes clean and comfortable to live in, as stated by the following respondents:

Res 3: I feel that keeping my environment clean to remain a beautiful waste-free area is my responsibility because I am part of the residents here.

In life skill education based on the empowerment of socio-cultural aspects, it becomes a catalyst so that one individual and another continue to have the same passion in keeping the program ongoing in a sustainable manner. In this densely populated Cibunut settlement, it can be seen that their empowerment-based life skills education program continues because they continue to uphold the spirit of cooperation and other socio-cultural aspects that bind them to each other. This research shows that the implementation of life skills education cannot be separated from the aspects of empowerment that are closely related. Life skills education aims to form critical, creative thinking, solve problems, find solutions, and make the right decisions in dealing with problems.

4. Conclusion

As a big country until now, Indonesia is still difficult dealing with waste problems, so it needs a solution that the government must do, and the community must participate in helping to overcome the problem. Based on the results of data analysis that has been obtained, it can be concluded that empowerment-based life skills education is one solution in handling waste problems that can be done with a bottom-up approach. By involving the whole community as program implementers, the program can be sustainable. Starting from an environmentalist named Mrs. Tini, who came up with the idea of a waste-free area and involved the entire community, finally, the densely populated Cibunut settlement became a waste-free area.

The approach invites people to think critically to find problems and solve them, then creatively turn waste into something valuable and used as handicrafts. In addition, through life skills education, which waste management experts originally taught, finally, the densely populated residential community of Cibunut has become a society that is good at managing organic and non-organic waste and is even able to provide waste management training to the community or other environmentalist communities who want to learn to manage waste.

The novelty of this research is to develop a theoretical concept of effective decision-making life skills and three aspects of empowerment based on the results of research and observations about the community in Cibunut, which is an area with scattered garbage to be clean, comfortable, and free of waste with people who have high awareness to protect the environment. The Cibunut settlement is an example of a densely populated settlement that was once a slum transformed into a clean and comfortable waste-free area.

The involvement of stakeholders is the key to the success of a life skills education program that can empower the community. In addition, the government should be able to see this as an opportunity to fully support the community's movements with funding

assistance and facilities and infrastructure as an effective waste management effort. This study only reviews three aspects of empowerment through the theory of life skills education. This research still needs further development to implement life skills education in managing waste based on community empowerment.

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