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Integration of Merdeka Curriculum with Zero Waste Movement: an Innovative Key in Solving Environmental Damage

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ABSTRACT: Based on previous research, environmental damage caused by waste is due to people's habit of littering. One of the solutions that can be taken is by integrating the Independent Curriculum with the Zero Waste Movement. This study aims to explore the integration of the Zero Waste Movement in the Merdeka Curriculum, with a focus on intra-curricular activities, extracurricular activities, school culture, and strengthening projects for Pancasila Student Profiles. This study uses a literature study approach, by reviewing various relevant sources and analyzing how such integration can be carried out effectively. The results of the study show that integration with the Merdeka Curriculum covers certain subjects that support the understanding and practice of Zero Waste. In extracurricular activities, the Zero Waste Movement can be made a work program by members (Adiwiyata cadres). The Zero Waste Movement can become a school culture if all school members actively participate in the 5R activities (Reduce, Reuse, Recycle, Refuse, and Rot) repeatedly, scheduled, organized, and can be evaluated. The Zero Waste Movement is part of the project to strengthen the Pancasila Student Profile, with schools holding co-curricular activities in the form of student projects that support the implementation of the movement. In conclusion, the integration of the Zero Waste Movement into the Merdeka Curriculum not only has the potential to increase environmental awareness among students but also to strengthen Pancasila values, making it an integral part of character education and school culture.

Keywords: environmental damage, merdeka curriculum, waste, zero waste movement.

ABSTRAK: *Berdasarkan penelitian sebelumnya, kerusakan lingkungan yang disebabkan oleh sampah terjadi karena kebiasaan masyarakat yang membuang sampah sembarangan. Salah satu solusi yang dapat diambil adalah dengan mengintegrasikan Kurikulum Merdeka dengan Gerakan Zero Waste. Penelitian ini bertujuan untuk mengeksplorasi integrasi Gerakan Zero Waste dalam Kurikulum Merdeka, dengan fokus pada kegiatan intra-kurikuler, ekstra-kurikuler, budaya sekolah, dan proyek penguatan Profil Pelajar Pancasila. Penelitian ini*

menggunakan pendekatan studi pustaka, dengan meninjau berbagai sumber yang relevan dan menganalisis bagaimana integrasi tersebut dapat dilakukan secara efektif. Hasil penelitian menunjukkan bahwa integrasi dengan Kurikulum Merdeka mencakup mata pelajaran tertentu yang mendukung pemahaman dan praktik Zero Waste. Dalam kegiatan ekstra-kurikuler, Gerakan Zero Waste dapat dijadikan program kerja oleh anggota (kader Adiwiyata). Gerakan Zero Waste dapat menjadi budaya sekolah jika seluruh warga sekolah aktif berpartisipasi dalam kegiatan 5R (Reduce, Reuse, Recycle, Refuse, dan Rot) secara berulang, terjadwal, terorganisir, dan dapat dievaluasi. Gerakan Zero Waste menjadi bagian dari proyek penguatan Profil Pelajar Pancasila, dengan sekolah menyelenggarakan kegiatan kokurikuler berupa proyek siswa yang mendukung pelaksanaan gerakan tersebut. Kesimpulannya, integrasi Gerakan Zero Waste ke dalam Kurikulum Merdeka tidak hanya berpotensi meningkatkan kesadaran lingkungan di kalangan siswa, tetapi juga memperkuat nilai-nilai Pancasila, sehingga menjadi bagian integral dari pendidikan karakter dan budaya sekolah.

***Kata kunci**: gerakan zero waste,kerusakan lingkungan, kurikulum merdeka, sampah.*

INTRODUCTION

This paper begins with the background of environmental damage caused by the increasing amount of waste. According to data from the World Bank Group, Indonesia produces around 175,000 tons of waste daily, with 20% of it ending up in rivers and beaches. Furthermore, according to the 2023 Atlas of Sustainable Development Goals published by the World Bank.

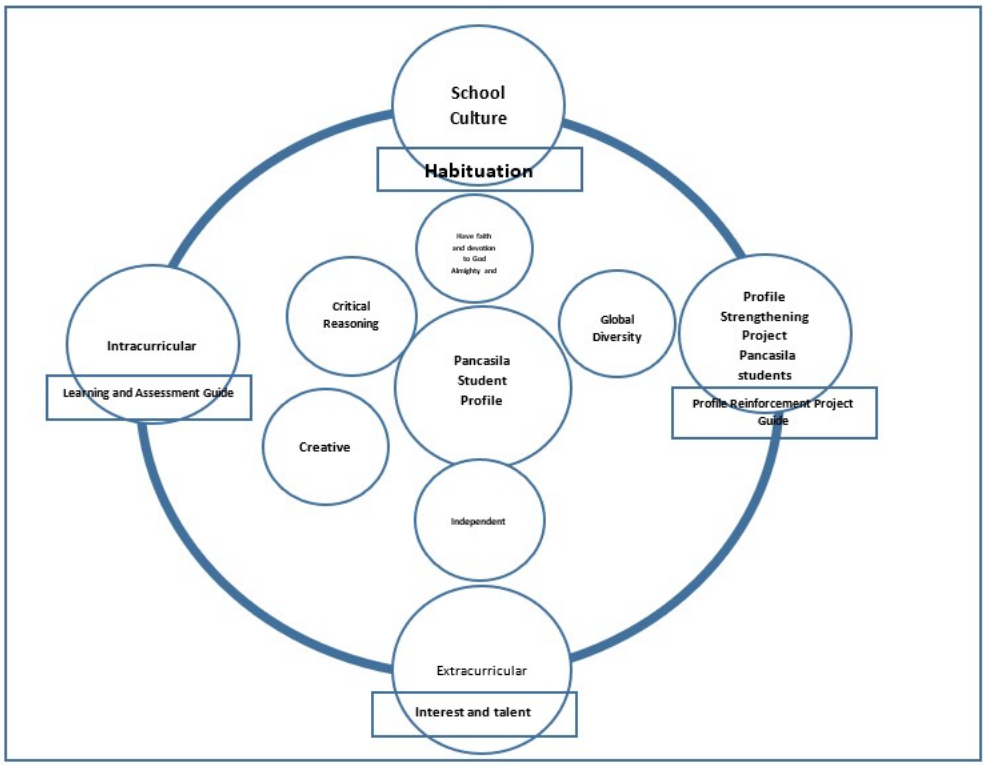
Figure 1. List of the Largest Waste Producing Countries in the World
Source: World Bank, 2020

The image above is an infographic that presents data on the world's largest waste-producing countries based on a 2020 World Bank report. The country with the highest waste production is China, reaching 395.1 million tons. Then, the United States and India occupy the second and third positions with waste production of 265.2 million tons and 189.8 million tons, respectively. Indonesia is ranked fifth with a waste production of 65.2 million tons. This indicates that the waste problem is also a serious challenge in our country. Other large countries such as Brazil, Russia, Mexico, Germany, Japan, and France are also among the top 10 waste producers in the world. Overall, this information provides a clear picture of the scale of the global waste problem, especially in countries with large populations and industries. Furthermore, upon further examination, there are many factors that have caused the waste problem to remain unresolved until now. In fact, this problem has grown larger over time, resulting in environmental damage such as floods, disease outbreaks, and other negative impacts. The increase in waste is mainly caused by people's habit of littering. Research by Natalia, et al. (2022) shows that 69% of people in Kluncing Village, Banyuwangi, still often litter. In addition, according to Putra et al. (2022), the lack of public understanding of environmental management has exacerbated this habit.

Bahrum Subagiya, a lecturer at Ibn Kaldun University Bogor, stated in Republika.post (2020) that environmental damage caused by waste is due to three main factors: lack of awareness to protect the environment, poor waste management, and the abundance of products that produce waste. To address this problem, various parties, both government and private, continue to promote the Zero Waste movement. This movement encourages people to reduce waste production by implementing the 5R principles: refuse, reuse, reduce, recycle, and rot. Zero Waste was first introduced by Palmer in 1973 as a concept to recover resources from waste. Simply put, Zero Waste means eliminating unnecessary waste from every product and every stage of its life cycle (Nizar, et al., 2017).

Schools have a strategic role in promoting the Zero Waste movement through integration into the curriculum. This integration covers various aspects such as environmental awareness, the concept of Zero Waste as a sustainable solution, the role of schools in shaping sustainable living practices, and support from the school and other stakeholders. One example of this integration is the cooperation between the Ministry of Education and Culture and the Ministry of Environment and Forestry, which is realized in Ministerial Regulation of Environment and Forestry No. 52 of 2019 concerning the Movement to Care and Cultivate Environmental Culture in Schools (GPBLHS). Schools that implement GPBLHS are known as Adiwiyata Schools, which prioritize environmentally oriented policies, environmentally based curriculum implementation, participatory activities, and environmentally friendly facilities management. With the implementation of the Merdeka Curriculum, which according to the Ministry of Education, Culture, Research, and Technology aims to develop students' soft skills and character and focuses on essential materials and flexible learning, the author argues that the Zero Waste movement can be integrated into intra-curricular programs, extracurricular activities, school culture, and the Strengthening of Pancasila Student Profiles (P5) project.

The flow of the Merdeka Curriculum principles can be seen in the Figure below:



Source: Ministry of Education and Culture 2023

Figure 2. Form of Independent Curriculum Structure

The above figure illustrates that the implementation of the Pancasila Student Profile, particularly in fostering a generation that is aware of the dangers of waste and embodies the mindset, attitude, and behavior of Zero Waste, can be pursued through learning activities such as intramural, extracurricular, the Pancasila Student Profile Strengthening Project (P5), and school culture (habituation). The author believes that the integration of the Merdeka Curriculum with the Zero Waste movement can serve as an innovative key to addressing environmental damage caused by waste by maximizing these four activities within the Merdeka Curriculum: intramural, extracurricular, school culture (habituation), and the Pancasila Student Profile Strengthening Project (P5). This integration is expected to raise students' awareness of waste issues and encourage educational institutions to play a more active role in environmental preservation. The character traits expected to be developed through the Merdeka Curriculum, such as faith and devotion, global diversity, independence, teamwork, critical thinking, and creativity, align with the goals of the Zero Waste movement.

Aligning the Zero Waste movement with the Merdeka Curriculum is a crucial step to ensure that the understanding and practice of Zero Waste are thoroughly implemented within educational settings. This integration can be

achieved through specific subjects, collaborative projects, extracurricular activities, and school culture that support the application of Zero Waste principles.

Based on this background, the author has written this paper titled "Integration of the Merdeka Curriculum and the Zero Waste Movement as an Innovative Key to Addressing Environmental Damage Caused by Waste." The goal is to analyze how the integration of the Zero Waste movement can be carried out in intramural, extracurricular, school culture, and the Pancasila Student Profile Strengthening Project (P5) within the Merdeka Curriculum.

RESEARCH METHOD

This research employs the Literature Review approach. According to Zed (2003), Literature Study or bibliography can be interpreted as a series of activities related to the method of collecting literature data, reading, note-taking, and processing research materials. This literature research method is used to formulate concepts regarding the integration of the Merdeka Curriculum with the Zero Waste Movement as an innovative key to addressing environmental damage issues due to waste. The steps in literature research according to Kuhlthau (2002) are as follows: (1) Topic selection, (2) Information exploration, (3) Determining research focus, (4) Data source collection, (5) Data presentation preparation, (6) Report preparation. The data sources for this research consist of books, journals, and internet sites related to the Merdeka Curriculum, Zero Waste Movement, and environmental issues due to waste. The data collection technique in this study is documentation, which involves searching for data on things or variables in the form of notes, books, papers or articles, journals, and so on (Arikunto, 2010). Meanwhile, the research instruments in this study include a checklist of research material classification, a writing scheme/map, and a research note format.

RESULTS AND DISCUSSION

Intracurricular Integration with the Zero Waste Movement

Intracurricular refers to learning activities conducted during scheduled class hours and aligned with the official curriculum structure in schools. Subjects covered in intracurricular activities are mandatory for all students. In the effort to achieve sustainable development goals, waste reduction is crucial. The Zero Waste movement emerges as an effective solution to address environmental impacts caused by waste. In Indonesia, the Merdeka Curriculum could be a strategic step in supporting the Zero Waste Movement through intracurricular activities.

According to the Minister of Environment Regulation No. 52 of 2019, the implementation and development of an Environment-Based Curriculum can be interpreted as the development of a learning model that involves multiple subjects, exploration and development of materials, and environmental issues relevant to the local community. Environmental Education can be realized through two approaches: monolithic, as an independent subject, or integrative, aligned with other subjects (according to the conditions of each region or school).

The Merdeka Curriculum provides schools with the freedom to design the curriculum according to local needs and contexts, including alignment with local wisdom and sustainability principles. Intracurricular integration in the Merdeka Curriculum can be achieved by adapting learning materials to Zero Waste values

and practices. For example, in natural science subjects, students can understand the life cycle of waste, its impacts, and recycling technologies. Mathematics can utilize statistical data on waste amounts and efficiency calculations in waste management. On the other hand, Bahasa Indonesia can discuss the importance of the Zero Waste Movement through essays or articles, as well as presentations.

According to Darmawati and Purnomo (2022), teachers can implement the 3R technique (reuse, reduce, and recycle) in learning activities, especially in science experiments. Collaboration between subject teachers, such as science and crafts, can create craft projects using plastic waste, such as classroom decorations or flowers from used plastic bottles. Teachers need to acquire these skills through village training to support student understanding. In order to succeed in this strategy, teacher understanding is crucial to support the successful formation of student awareness of the importance of preventing environmental damage from waste (Ain & Mustika, 2021).

Student involvement is also crucial in the Zero Waste Movement. Practical learning, such as environmental projects, visits to waste management facilities, or participation in waste management activities at school, can help students understand the positive impacts directly. Periodic evaluations by students, teachers, and the community are necessary to ensure the program remains relevant and effective.

Extracurricular Integration with the Zero Waste Movement

Implementing extracurricular activities in the framework of the Merdeka Curriculum can be an effective platform to promote the Zero Waste Movement among students, ultimately contributing positively to environmental issue resolution. Extracurricular activities focused on environmental preservation are generally known as Adiwiyata Cadres, following the Ministry of Environment and Forestry Regulation of the Republic of Indonesia Number P.52/MENLHK/SETJEN/KUM.1/9/2019 concerning the Environmental Care and Culture Movement in Schools.

Adiwiyata Cadres, as an extracurricular activity in the field of environmental education, aims to encourage students' knowledge and awareness of environmental conservation. Besides supporting the creation of a clean environment, the Adiwiyata program also includes learning activities such as school hydroponic garden management, nursery garden management, and waste recycling processes.

Adiwiyata Cadres integrated with the Merdeka Curriculum provide an opportunity for students to develop environmental skills and awareness beyond the classroom, aligning with the freedom and flexibility principles of the Merdeka Curriculum philosophy.

In extracurricular activities, the Zero Waste movement can become a working program for members. The Zero Waste movement promoted by extracurricular members aims to enhance students' knowledge and awareness of environmental preservation and prevention of environmental damage due to waste. Various extracurricular activities can be designed to provide in-depth understanding of the Zero Waste movement, including:

Environmental Club: Students can actively participate in an environmental club aimed at deepening understanding of waste impacts and reducing waste in the surrounding environment.

Recycling Projects: Organizing recycling projects in schools or local communities to teach students proper recycling practices and waste management.

Tree Planting and Cleanup Activities: Involving students in direct activities related to cleanliness and environmental conservation, such as tree planting and open area cleaning.

External involvement, such as community groups, non-profit organizations, or local governments, in extracurricular activities can provide practical experience to students regarding the implementation of the Zero Waste movement in society. According to recent developments, awareness- raising and training need to be conducted to improve understanding of the Zero Waste movement, proper waste management, and the latest innovations in waste reduction. The core material conveyed in outreach can include the current environmental conditions, especially concerning plastic waste, as well as types of waste and the natural degradation timeframe. It can also explain ways to avoid, process, and dispose of waste (Moerdjoko & Widyatmoko, 2012).

Schools need to establish monitoring and evaluation methods to measure the impact of extracurricular programs on environmental awareness and student participation in the Zero Waste movement. Finally, organizing showcases of student work or competitions related to the Zero Waste movement is expected to motivate students and increase public awareness of this issue.

Habituation Integration (School Culture) with the Zero Waste Movement As an educational institution, schools play a vital role in shaping habits and positive attitudes towards the environment. The Directorate General of PMPTK (2007) defines school culture as a system of values, beliefs, and norms accepted collectively, consciously implemented as natural behavior shaped by the environment, by creating a shared understanding among school members. Schools can initiate the Zero Waste initiative by adopting sustainable waste management policies. These steps include separating organic and inorganic waste, using appropriate waste bins, and placing recycling stations throughout the school area.

To establish Zero Waste habits, schools can start with education and awareness-raising. This effort involves organizing educational campaigns and seminars emphasizing the importance of waste reduction and the contribution of each individual to the Zero Waste movement. In addition, schools can choose to use environmentally friendly goods and materials in daily operations, such as office equipment, furniture, and school supplies that can be recycled or transformed into biodegradable items.

The Zero Waste movement is not limited to waste management but also involves resource conservation. Schools can adopt programs to reduce energy and

water consumption, such as using energy-efficient bulbs, installing energy efficient equipment, and implementing water-saving campaigns. Implementing the Zero Waste policy in the school cafeteria can also be a significant step. The use of reusable food containers, reducing the use of disposable packaging, and supporting local producers to reduce transportation waste are concrete actions that can be taken.

The active involvement of students in environmental projects, such as cleanup activities, tree planting, or recycling projects, can help form positive habits early on. Active student participation can create more effective behavioral changes. It is also essential to implement a monitoring and evaluation system to measure the success of the Zero Waste habituation implementation in schools. By collecting data, schools can evaluate its impact and make necessary changes. Zero Waste habits in schools go beyond waste management and create a culture of sustainability that permeates every aspect of school life. By implementing concrete measures and involving the entire school community, we can create a sustainable educational environment and set a positive example for future generations. Integration of the Strengthening Student Pancasila Profile Project with the Zero Waste Movement To make the Zero Waste movement more effective in addressing environmental damage due to waste, schools also need to integrate the movement with the Strengthening Student Pancasila Profile Project (P5).

The Strengthening Student Pancasila Profile Project is a project-based co-curricular learning activity. This program is structured according to Graduation Competency Standards (SKL) and designed to enhance competency and character achievements in accordance with the dimensions of the Pancasila student profile. This is in line with the regulations of the Ministry of Education and Culture, Research, and Technology number 56 of 2022. The Directorate of Junior High Schools (2022) states that the Strengthening Student Pancasila Profile Project encompasses interdisciplinary learning to find solutions to local environmental problems.

The Strengthening Student Pancasila Profile Project adopts a project- based learning approach that differs from project-based learning in the intracurricular program. In the implementation of this project, students are trained to investigate crucial topics around them. This is aimed at enabling students to contribute effectively to solving these issues according to their level of learning and needs.

According to Suhardi (2022) as cited by Safitri et al., this project emphasizes the importance of training students to understand significant issues in their environment so that they can effectively participate in responding to these issues according to their level of understanding and needs.

Integrating the Zero Waste movement into the Strengthening Student Pancasila Profile Project in schools can choose sustainable living themes with the aim of creating a positive impact on shaping sustainable student characters and attitudes. Values such as mutual cooperation, justice, and togetherness can be the main foundation to motivate students to contribute to environmental sustainability.

The Strengthening Student Pancasila Profile Project can be directed to incorporate character education and environmental awareness aspects. Students are taught to understand the environmental impact of consumptive behavior and how Pancasila values can encourage them to act more responsibly towards the environment. Combining the Zero Waste movement in collaborative projects can

actively involve students in implementing Pancasila profile values. For example, a recycling project in schools involving all students in the waste sorting process and creating creative items from used materials.

In integrating the Zero Waste movement into the Strengthening Student Pancasila Profile Project (P5), schools and cross-disciplinary teachers can collaborate to guide students in taking small steps to address environmental issues caused by waste, such as campaigning to reduce paper usage, optimizing digital technology, and choosing recyclable materials.

By embracing Pancasila values that emphasize sustainability and harmony between humans and nature, the student profile strengthening program can include activities like tree planting and caring for green areas in schools. This is not only a tangible action against climate change but also a symbolic representation of concern for the environment.

Teaching recycling skills and creating creative products from recycled materials can be part of the student profile strengthening program. Empowering students to be agents of change in waste reduction and creating value-added products from waste. Regular evaluations of program effectiveness, involving students and school staff in designing improvements and adjustments, are essential. This process can create a continuous learning cycle and enhance the positive impact of the Zero Waste movement. Integrating the Zero Waste movement into the Strengthening Student Pancasila Profile Project in schools not only creates intelligent and ethical students but also generations caring for the environment. By connecting Pancasila values with the sustainability movement, we can shape young people committed not only to character
development but also to a better future for the environment.

Discussion

Several considerations need to be considered when integrating the Merdeka Curriculum with the Zero Waste Movement as an effort to address environmental damage due to waste. These considerations include when integrating the zero-waste movement with intracurricular activities in schools, several factors need attention: (a) school principal policies, (b) knowledge of all stakeholders about the principles of the Merdeka Curriculum, (c) collaboration among subject teachers, (d) student readiness to learn, (e) approval of the school committee, and (f) a holistic learning evaluation system (knowledge, attitudes, and skills).

Considerations for realizing the zero-waste movement through extracurricular activities include: (a) extracurricular supervisors should be teachers who understand and care about the environment; (b) recruitment of extracurricular members (clubs) should be tailored to the interests and talents of students; (c) learning while doing; (d) the existence of a holistic extracurricular evaluation system.

To make the Zero Waste Movement a school culture or habituation, school members can start by habituating the 5R activities repeatedly, scheduled, organized, and evaluable. Integrating the Zero Waste movement into the Strengthening Student Pancasila Profile Project (P5) can be done by considering: (a) the project must align with the Merdeka Curriculum phase; (b) the chosen theme should be oriented towards sustainable lifestyles; (c) attention to environmental characteristics and

participants; (d) have benefits for students, schools, and the surrounding environment.

CONCLUSION

The integration of the Merdeka Curriculum with the Zero Waste Movement provides an innovative approach to addressing environmental damage caused by waste through education. By embedding this movement into intracurricular, extracurricular, school culture, and projects aimed at strengthening the Pancasila student profile, students develop a deep sense of environmental awareness and responsibility. In intracurricular activities, subjects like natural science, mathematics, and Indonesian language incorporate topics related to waste management, recycling, and environmental sustainability. Extracurricular activities, particularly those led by adiwiyata cadres, further support students' interests in environmental preservation. School culture also plays a vital role by fostering 5R habits—Reduce, Reuse, Recycle, Recover, and Refuse—that are practiced regularly by all members of the school community. Lastly, collaborative projects under Pancasila student profile strengthening (P5) bring teachers and students together in hands-on efforts to implement the Zero Waste Movement. This comprehensive approach nurtures environmentally conscious students and contributes to long-term sustainable behavior.

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