



**It was GREAT Program: Enhancing Pro-Environmental Awareness,
Knowledge and Action among Students using Participatory Action
Research Approach**

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ABSTRACT

This study aimed to develop a program to increase pro-environmental awareness, knowledge, and behavior among students at SMAN X in Makassar using the Participatory Action Research (PAR) approach. GREAT began with preparation, socialization, and environmental ambassador (EA) inauguration, then continues with program implementation which consists of five pro-environmental activities, namely Collecting Inorganic and Organic Waste, Cool with Reusable Stuff, Nature Gift Day, Planting and Watering a Tree to Support Green Nature, Upcycling Unused Stuff. After the implementation, a closing ceremony and program evaluation were held through FGD and self-reflection form. Overall, despite certain shortcomings that require attention for future programs, GREAT has effectively heightened awareness, knowledge, and redirected students' intentions toward pro-environmental actions not only in school but also in family and public environments. Additional endeavours are necessary to overcome challenges identified in the planning and execution of forthcoming interventions in other contexts.

Keywords: Pro-environmental Education; Participatory Action Research; Pro-environmental Action; Green School

INTRODUCTION

Changes in biodiversity, natural resources, and the physical environment are brought about by human impacts on the environment, such as pollution, overcrowding, burning fossil fuels, deforestation, and agricultural practices (DISLHK Kabupaten Badung, 2019; Fenia, 2023); these changes can result in ecological collapse, mass extinction, and environmental degradation (Tilman & Lehman, 2001; Unite for Change, 2022). To address and reduce these issues, the establishment of effective environmental management is essential, as it can facilitate a more harmonious relationship between humans and nature (Yekimov et al., 2021).

Since it encourages a responsible attitude toward the environment and harmonious interaction between humans and nature, environmental education is essential for effective environmental management (Yekimov et al, 2021). It is essential for managing carbon emissions because it may help alter non-sustainable behavior and provide sustainable solutions (Williams & Kemp, 2013). Environmental Education also helps in building the natural world, and gives knowledge and methods to solve complex environmental issues which also gives advancement to productive economies and harmony among communities (Alzubaidi et al., 2021). Sustainable development broadens the scope of environmental education, making it an essential part of curricula in schools and a driver of social change (Yarkandi et al, 2012).

Regarding social change as the impact of environmental education, the involvement of the younger generation is also needed, including addressing environmental issues. Previous research showed that the involvement of young people and students in the environmental movement has been a powerful force, igniting a global movement toward environmental sustainability. Young climate activists have been at the forefront of demanding policy action and driving transformative change for a better, greener future (Neas et al., 2022; Sloam et al, 2022). They have organized and amplified their voices through social media campaigns, educational videos, and engaging content and have successfully rallied support and called for group action on environmental issues (Neas et al., 2022).

School education is an appropriate entry point to start a social movement to address environmental issues by involving students who are also the younger generation (Peterson, 2022). The active participation of the young generation, especially students, in environmental issue-oriented social movements conducted in schools is important because it can significantly increase pro-environmental behavior and foster environmental awareness through emotional reflexivity (Mebane et al., 2023). Schools also provide a structured environment to foster a sense of moral responsibility towards environmentally sustainable practices and train students to connect emotionally with environmental issues around them (Han & Ahn, 2020). In addition, the form of intervention made is possible to be integrated with the school curriculum (Campigotto & Barret, 2017). In Indonesia, the attempt to strengthen pro-environmental behavior has been reinforced by the Ministerial Regulations KLH Number 5 Year 2013 concerning that Adiwiyata Green School manifests an attempt and reward for the development and contribution to environment-based education (Nurwidodo et al., 2019). Therefore, the implementation of the programs is expected to foster pro-environmental behavior among students.

Although the regulation has been made, the implementation of this program appears to be a formality and the recognition as a winning school. Furthermore, not many schools in Indonesia have integrated environmental education into their local content curriculum (Nurdin et al, 2023). In Makassar, one of the provinces in Indonesia, not many schools have made the program a reality. There are also not many programs to strengthen pro-environmental behavior in schools. Therefore, it is important to establish an intervention model to build up the environmental attitude and behavior.

There are about 11,155 schools in South Sulawesi, but there are only 5 high schools that received the Adiwiyata award in 2022. The data shows that there is still a lack of schools that have implemented the environmental care and culture movement in schools (Dinas Lingkungan Hidup dan Kehutanan Provinsi Sulawesi Selatan, 2022). The head of the environmental management department also expressed his hope that more and more schools will follow the environmental care and culture movement in schools so that it can have a positive impact on the

surrounding environment. Even schools that have received the Adiwiyata award often still encounter obstacles to remaining consistent in implementing the programs that have been developed previously. Therefore, other intervention model aspirations are needed to prevent the stagnation of Adiwiyata schools (Nurdin et al, 2023).

SMA X Makassar is one of the Senior High Schools in Makassar that also participates in realizing the Adiwiyata program. Problems with the school environment were discovered based on observations and interviews with teachers made at SMAN X Makassar. These included the occurrence of disposable plastic garbage remaining in the schoolyards and gutters due to student consumption. This is a result of pupils acting in a way that does not recognize that it is not environmentally friendly. One of the contributing issues is the dearth of student-focused interventions meant to improve pro-environmental behavior in the school concerning plastic trash, since students are the primary stakeholders. The school is working to establish a green learning environment, one of which is the Adiwiyata initiative. However, the goal of these initiatives is not to have students proactively adopt environmentally friendly behaviors on their own.

The interventions that were previously implemented either deviated from the researcher's original conception or were pre-planned. Put differently, the interventions that were created did not originate from the feedback provided by the participants, who in this instance ought to be actively involved in resolving concerns within their community. As a result, the researcher expected to develop a participatory action research-based strategy for enhancing pro-environmental behavior.

The environmental issues observed at SMA X provide an opportunity to apply Participatory Action Research (PAR), as this study aims not only to understand the problem but also to actively intervene and support transformative change. This approach necessitates the involvement and leadership of individuals directly affected by the issue, enabling them to participate in actions that foster social change. PAR fosters collaboration between those with firsthand experience of an environmental problem and professional researchers, often from universities, who bring essential knowledge, expertise, resources, and networks to the initiative (Cornish et al., 2023).

This research facilitated the development of a model based on the participant's point of view and the context of school (SMA X). Hence, this research aimed to develop a model to strengthen the student's environmental knowledge and attitude and shift it into the pro-environmental action according to the participatory action research framework. The research question was how was the development of the program to increase awareness, knowledge, and action formulated together between several stakeholders (researchers, students, teachers) at SMAN X Makassar?

METHOD

This study applied Participatory Action Research (PAR), an approach to research that prioritizes community members' involvement and action in relation to the research issue. Participatory Action Research (PAR) is an umbrella term for collaborative research approaches that engage participants in both researching and implementing solutions to specific issues. Together, researchers and participants attempt to comprehend a problematic situation and make necessary changes (Baum et al., 2006; Cornish et al., 2023). The democratic processes that

involve directly engaging local objectives and viewpoints are highlighted by PAR (Vaughn & Jacquez, 2020).

Participants and Stakeholders

A total of 63 SMAN X Makassar students from seventh grade participated in this participatory action research. The participants consisted of Agents of Change (AoC) and Environmental Ambassadors (EA). AoC were seventh-grade students who were willing to be involved in this research. The existence of Agent of Change provides an opportunity for students to be at the forefront of contributing to better changes related to environmental sustainability at school. In addition, researchers identified each person from 7 class representatives as the leader or agent of change, called EA. The EA was established as the leader of the students who were part of the AoC and as a communication link between the researcher and the AoC. This process involved selecting and appointing students who were considered to possess strong leadership and motivation to become environmental ambassadors at their grade level. Researchers did not apply any specific instruments or scales related to leadership or agents of change. The selection of EA from all classes might guarantee equitable representation and active involvement of all students in pro-environment programs. The Teacher and Vice Principal for student affairs also gave suggestions related to the selection criteria. Class representatives as leader environmental ambassadors (EA) played a crucial role in forming and leading each class in implementing pro-environment programs developed at school. They promoted and gave examples of the program implementation to all students involved.

Besides, several stakeholders of the schools had also given their contribution, namely School Principal, Vice Principal for Student Affairs and teachers who were homeroom teachers. They were involved in the process of formulating programs that could be implemented at the school through the interview process conducted by the researcher. Specifically, Vice Principal and homeroom teacher also monitored the processes of program implementation.

All participants and stakeholders, including the school principal, who participated in this study had expressed their consent to be involved in the research process. They signed an informed consent form that explained, among other things, the purpose of the study, the duration, the terms and conditions of involvement, the possible effects of participating in the study, and the benefits. This study design received ethical clearance from the Ethics Committee of the Faculty of Medicine, Universitas Hasanuddin.

Data Collections

Several data collection methods were applied, aiming to collect information that would be used as the basis of program development.

School Observation. Initially, the researcher made environmental observations as a non-participant observer at SMAN X Makassar in early February to obtain data on the visible environmental issues related to student behavior, considering that the school had already made efforts to uphold cleanliness and encourage pro-environmental behaviors. While the pupils were participating in extracurricular activities, our team paid a visit to the school. From the observation recording, the researcher concluded that SMAN X Makassar placed multiple trash cans next to the classrooms for the students. The presence of garbage cans close to classrooms ought to encourage environmentally conscious behavior of the students. Our team did find,

however, that there was still trash scattered in the gutter next to the classroom corridor, in the park by the school field, and around the trash can.

In addition, we observed that practically every student present on that particular day had food packaged in plastic and throwaway plastic bottles and cups. A sustainable environment may be threatened by some of the issues. As a result, the study team started concentrating on examining suitable steps to enable SMAN X Makassar to develop into a school that promotes environmental sustainability in an environmentally responsible way.

Stakeholder Interview. In addition to observation, the research team also conducted interviews in the same month with school stakeholders previously mentioned. We posed four main questions, namely: 1) What were the issues related to the environment and students' pro-environmental behavior?; 2) What efforts had the school made to address these issues?; 3) What obstacles had the school encountered in achieving its goals related to these challenges?; and 4) What were the recommended programs that could be implemented in the school, tailored to the characteristics of the students?.

The environmental issues found from the interviews were a continuation of the previous findings from the school observations. In the interview with the Principal of SMAN X Makassar, we learned that they had experienced flooding due to the school's drains being clogged by garbage thrown carelessly by the students. The students often buy plastic-packaged food and beverages in the school canteen but are not so concerned about the impact of plastic waste on the environment. Although trash bins have been placed near the classroom doors, plastic waste is often found scattered in the corridors and school gutters. Eventually, the plastic waste clogged the school's sewer. Moreover, despite the principal and vice principal making appeals during flag ceremonies for students to maintain a clean environment, supported by reminders from teachers, many students still appear indifferent to these appeals, as evident in their waste management behavior. The school itself has never conducted an in-depth investigation into the causes of students' lack of awareness and practice of pro-environmental behavior. Therefore, the principal fully supported the research team's efforts to develop treatments that could improve the school environment. The vice principal for student affairs suggested that the intervention for students be done in groups and led by students who are high achievers in the school and have leadership skills.

Focus Group Discussions. A Focus Group Discussion (FGD) with several students as class representatives was one of the methods employed to learn more about the pro-environment experiences and opinions of the students. The researcher asked the same questions as we posed for the interview. From the FGD conducted on third week of February, the researcher recognized that students' lack of awareness needs to be enhanced to positively shift their attitudes toward pro-environmental behavior. Additionally, some students indicated that insufficient knowledge about pro-environmental behavior is a contributing factor. Others argued that, even with knowledge and awareness, translating it into action is challenging, especially as few around them model these behaviors. Their peers tend to behave similarly, showing little evidence of pro-environmental actions.

We tentatively concluded that there is a need for systematic, engaging activities to enhance students' awareness, knowledge, and practice of pro-environmental behaviors, as well as to cultivate an environment where such behaviors are widely demonstrated among students, thereby fostering an appreciative and supportive atmosphere for promoting and achieving these pro-environmental behaviors. Furthermore, we seized an opportunity in line with the principal's suggestion regarding the group and its chairperson. Class representatives could play a crucial

role in forming and leading each class in pro-environment programs at school. Therefore, we decided to identify and organize each class representative's Environmental Ambassador (EA) as a key person of this Participatory Action Research. This process involves selecting and appointing students who were considered to possess strong leadership and motivation to become environmental ambassadors at their grade level. The selection of EA from all classes might guarantee equitable representation and active involvement of all students in pro-environment programs

GREAT Development

Following observations of the school environment, stakeholder interviews, and focus group discussions with students, a SWOT analysis was conducted by the research team to develop the pro-environmental program. SWOT analysis, which consists of strengths, weaknesses, opportunities, and threats, is a widely used tool for analyzing internal and external environments to attain a systematic approach and support for decision situations. SWOT has been effectively applied, including environmental sectors (Ghazimoory et al., 2011). In the study by Lozano and Vallés (2007), the primary function of SWOT analysis is to evaluate the local context and identify strategic points for implementing an Environmental Management System in the municipality of Ohanes, Spain. This SWOT analysis serves as a foundational tool to assess the internal strengths and weaknesses, as well as external opportunities and threats, associated with environmental initiatives in public administration.

Analysis of strengths and opportunities indicated that the research team's background in psychology and specific interest in environmental psychology were valuable assets for developing and implementing targeted interventions for environmental issues at SMAN X Makassar. Consequently, the team proposed a program grounded in the Theory of Planned Behavior (TPB) by Ajzen (2005) to address environmental challenges at SMAN X Makassar after considering the problems and obstacles faced by students (i.e. lack of awareness, knowledge, and practice, and the importance of peers' presence).

The Theory of Planned Behavior (TPB) has been widely applied to studies of pro-environmental and sustainable behavior, with its structure supported by analyses from prior research (see Akhtar & Soetjipto, 2014; Bamberg & Möser, 2007; Budovska et al., 2020; Gusti et al., 2015; Han et al., 2010; Harland et al., 1999; Heath & Gifford, 2002; Klöckner, 2013; Tonglet et al., 2004). According to TPB, individuals are more likely to engage in sustainable behavior if they hold a positive attitude toward the behavior, if social expectations and support align with this behavior, and if they feel capable of translating their intentions into actions. Research by Hagger and Hamilton (2024) also demonstrated that the theory of planned behavior can be effective over the long term, as attitudes, subjective norms, intentions, and behavioral control tend to stabilize over time, leading to gradual changes within individuals that can last longer.

In addition, the researcher's strong interpersonal skills were essential for the team to maintain positive relationships with the school—particularly with teachers, including the principal, vice principal of student affairs, homeroom teachers, students, and even the school canteen staff—ensuring that the team could obtain necessary permissions and carry out activities to completion. Furthermore, creative thinking was key to designing engaging and beneficial environmental activities for students, teachers, and the school community. Finally, effective and insightful use of funds for each GREAT program agenda ensured activities were both optimal and enjoyable.

To address weaknesses, the strengths could be further optimized. Our analysis indicates that the implementation of GREAT activities required a relatively long duration, which presented an opportunity to thoroughly examine each aspect of the Theory of Planned Behavior as the guiding framework for GREAT. Additionally, teacher participation in providing constructive feedback might assist the research team in engaging participants who were less proactive throughout the activities.

Researchers could leverage strengths to mitigate threats, particularly by emphasizing time management to address scheduling conflicts. Misalignment of available times between the research team and the school—specifically students as participants and teachers—highlights the need for each research team member to practice effective time management to align schedules with participants and staff at SMAN X Makassar. The research team also empowered grade 7 students with leadership skills, supported by the vice principal for student affairs, to participate as Environmental Ambassadors. The research team determined the participants of the activity was the first grade of high school, especially for those who want to be selected as Environmental Ambassador. The decision was based on the consideration that new high school students have more free time than the level above and to ensure the chain of program sustainability at SMA Negeri X Makassar can continue to the next generations at the school.

To address weaknesses and threats, all research team members should remain flexible in aligning the research team's available time with that of school participants. Additionally, grouping participants as Agents of Change and Environmental Ambassadors could facilitate monitoring activity progress and serve as role models for others. Posting documentation of each Environmental Activity on participants' Instagram accounts might also foster positive peer pressure, encouraging continued enthusiasm for pro-environmental behavior. Recognizing the best Agent of Change team during GREAT activities could further motivate participants to actively engage in these initiatives.

The research team proposed the Green Action (GREAT) program, which included six main activities. Building on this, the research team developed an intervention model consisting of several phases: 1) preparation, 2) socialization, 3) Environmental Ambassador (EA) inauguration, 4) pro-environmental activities, 5) closing event and evaluation, and 6) reflection and final focus group discussion. The Theory of Planned Behavior (TPB) concept was primarily applied in phases 3 through 5. The research team presented these activities to the vice principal, teachers, and some students, with all phases receiving approval from the stakeholders involved from the outset, including the students who participated in the focus group discussions.

RESULT AND DISCUSSION

Result

Program Implementation

The Green Action (GREAT) program was held for four months from March to June 2023. The following is a flowchart of the GREAT program.

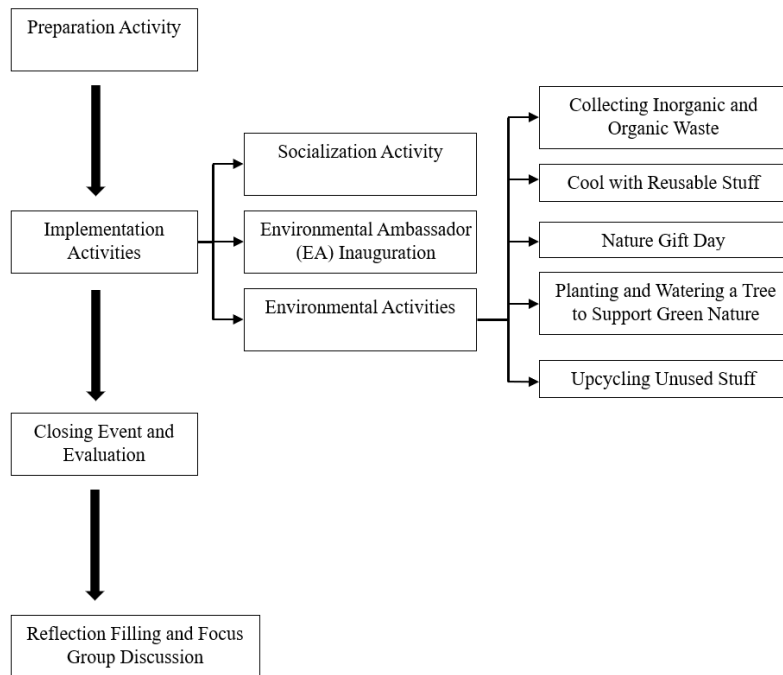


Figure 1. GREAT Program Flow

Preparation. The research team has conducted several preparatory steps for the GREAT program. They provided a permission letter and program proposal to the Vice Principal of SMAN X Makassar. Upon receiving confirmation from the school, the team conducted school observation, stakeholder interviews, and Focus Group Discussion. The team also held a special meeting with the Vice Principal for Student Affairs to prepare selected students as Environmental Ambassadors (EAs), representing each class. The selection of EAs was also based on the interest and willingness of the respective 10th-grade students. Following this discussion, the research team convened to prepare for the socialization phase, during which they conducted a briefing on the activities and created educational videos about GREAT at Universitas Hasanuddin.



Figure 2. Program Preparation

Socialization. The team conducted socialization sessions across six 10th-grade classes at SMAN X Makassar, with each session lasting 60 minutes. The purpose was to introduce the GREAT program to participants, beginning with an educational video presentation on GREAT. The research team also provided information on environmental issues, particularly plastic waste, its connection to the Sustainable Development Goals (SDGs), and an overview of the GREAT activity flow. Additionally, the team assisted Environmental Ambassadors (EAs) in forming their groups, referred to as Agents of Change (AoC). Key messages were also included to promote values that support pro-environmental behavior.



Figure 3. Program Socialization

Environmental Ambassador (EA) Inauguration. The research team, along with the Vice Principal for Student Affairs, conducted the inauguration of the Environmental Ambassadors (EAs) in the hall of SMAN X Makassar. This inauguration aimed to introduce all GREAT intervention participants to their class EAs. During the event, the team distributed equipment and resources for each class's Agents of Change (AoC) to use in the GREAT activities, including waste bags, beverage tumblers, stainless steel straws, and kale seeds. Each EA and AoC member also received a pin to signify their participation in the GREAT intervention activities.



Figure 4. Environmental Ambassador (EA) Inauguration

Implementation of Pro-Environmental Activities

Collecting Inorganic and Organic Waste. This activity involved collecting inorganic (cans or plastic bottles) and organic (dry leaves) waste scattered around the school to help reduce waste. All AoCs participated in collecting materials that could be reused in future environmental

activities. Conducted over one week, the AoCs documented their waste collection efforts on personal or class Instagram Stories, using the provided twibbon as a campaign tool and tagging the Green4w.id Instagram account.



Figure 5. Collecting Inorganic and Organic Waste

Cool with Reusable Stuff. This activity encouraged AoCs to avoid using disposable items, such as plastic bags and beverage containers. Instead, they were urged to use the tumblers and stainless-steel straws provided by the research team for their daily needs, particularly while at school. The goal was to reduce the use of disposable plastic bottles, styrofoam, and plastic straws within the school environment. This activity took place over one week, during which the AoCs documented the "Cool with Reusable Stuff" initiative on their personal and class Instagram Stories, using the provided twibbon and tagging the Green4w.id Instagram account.



Figure 6. Cool with Reusable Stuff

Nature Gift Day. This activity involved distributing 36 cups of free iced tea per day over 10 days, in collaboration with vendors selling iced tea. The initiative featured AoCs and non-AoC students from SMAN 21 Makassar, with free iced tea offered to those who brought reusable items, such as drinking tumblers or stainless steel straws. The aim was to encourage both AoC and non-AoC students to adopt reusable items and reduce plastic waste production at SMAN 21 Makassar. This initiative was also expected to establish a subjective norm, as the visible use of tumblers among students could create peer influence on those who do not bring tumblers and therefore do not receive free iced tea. AoCs documented this "Nature Gift Day" activity on their personal or class Instagram Stories, using the provided twibbon and tagging the Green4w.id Instagram account.



Figure 7. Nature Gift Day

Planting and Watering a Tree to Support Green Nature. This activity was conducted by AoCs after receiving kale plant seeds from the research team. AoCs from each class collaborated to plant and care for the seeds until they grew lushly, using potting media made from recycled plastic cups and fertilizer derived from collected dried leaves. The kale plants were placed in the school garden. Kale was selected because it requires minimal care and can be harvested, providing participants with a potential food source if cultivated successfully. The goal of this activity was for AoCs to develop a sense of responsibility in nurturing living plants, fostering an appreciation for and connection with the environment. This month-long activity was also documented by AoCs on their personal and class Instagram Stories, using the provided twibbon and tagging the Green4w.id Instagram account in their posts.



Figure 8. Planting and Watering a Tree to Support Green Nature

Upcycling Unused Stuff. This activity encouraged participants to recycle unused waste into practical items. AoCs conducted "Upcycling Wasted Stuff" activities, where they transformed discarded materials into useful objects, such as repurposing used bottles to create animal-shaped keychains. The AoCs incorporated these upcycled items into their regular activities. This

initiative aimed to raise awareness of the potential to recycle waste into valuable products while reducing waste accumulation. It was designed to foster a positive attitude toward environmental care, demonstrating that upcycling can yield new benefits and nurture creativity. The AoCs also documented and shared this activity on their Instagram accounts.



Figure 9. Upcycling Unused Stuff

Closing Event and Program Evaluation. The closing event was held by the research team at the Faculty of Medicine, Universitas Hasanuddin, Makassar, and lasted for three hours with several activities. The research team organized a group viewing of the movie *The Lorax*, which depicts a city reliant on technology, resulting in environmental degradation, particularly affecting trees and air quality. The movie served as an educational tool to emphasize the importance of environmental awareness and altruism. After the screening, a sharing and Q&A session took place between the service team and participants. Additionally, an Award Session recognized the top-performing AoC team. The event concluded with a documentation session, after which the research team returned to the school to complete the remaining evaluation activities.



Figure 10. Closing Event and Program Evaluation

Program Evaluation

To assess the success of the intervention program, the research team applied the principles of reflective learning. Reflective learning involves actively examining and analyzing past experiences to derive insights and meaning from them. This process helps learners understand their strengths, weaknesses, and areas for improvement, ultimately fostering deeper learning, self-awareness, and critical thinking skills (Boyd & Fales, 1983; Leitch & Day, 2001, Moon, 2013). The research team distributed a reflection paper form via Google Forms, inviting students to describe their experiences in the activity, the emotional dynamics they encountered, the insights gained from participation, and any future formulated based on these insights. This process enabled researchers to gather qualitative data on participants' impressions and levels of appreciation following their engagement in the GREAT program. Additionally, researchers were able to assess the insights participants gained through the program and to identify students' prospective action plans. Furthermore, this reflective process could facilitate students to evaluate themselves and determine future action plans.

The research team conducted a Focus Group Discussion (FGD) with ten students, including three EAs as part of the program's evaluation process, integrating principles of reflective learning. Held in October, approximately three months after the program's conclusion, the FGD aimed to gather comprehensive feedback from all participants, including students who actively engaged in the program and EAs. The discussion centered on evaluating the program's impact, specifically exploring changes in students' attitudes and behaviors resulting from their participation in the GREAT program. Additionally, the FGD sought constructive input on ways to enhance and further develop the program. Facilitated by the research team, the FGD session lasted one hour and served as a follow-up data collection activity to assess post-program changes. It also examined factors that supported or hindered participation, as well as influences on pro-environmental behaviors among participants. This session provided a deeper understanding of participants' experiences in internalizing pro-environmental behaviors during the GREAT activities, analyzed through the lens of the Theory of Planned Behavior.



Figure 11. Self-Reflection and Focus Group Discussion (FGD)

Discussion

Throughout and following the program, the research team observed several changes in students' knowledge, awareness, attitudes, intentions, and behaviors.

Changes in knowledge and awareness

Participants reported that this program broadened their perspectives and knowledge regarding environmentally friendly behaviors. They learned practical ways to manage organic and non-organic waste, such as recycling it into useful crafts or composting it for plants. The activity raised awareness among participants about the environmental and health impacts of waste, with some noting that their environmental knowledge was further enhanced through social media and internet resources.

In addition, the program provided insights into current environmental issues in Indonesia and strategies to address them. Participants recognized their individual contributions to environmental issues, particularly given Indonesia's status as the world's second-largest contributor to plastic waste after China, highlighting the importance of initiating pro-environmental actions on a personal level. Through the GREAT program, participants developed a deeper understanding of their responsibility as humans interconnected with nature, realizing that pro-environmental behaviors benefit not only the environment but also themselves and those around them, contributing to cleaner air and consumable crops from their own plants. They also acknowledged the necessity of collective efforts to protect the environment.

Moreover, participants gained hands-on knowledge about nurturing plants from seeds to harvest and noted that recycling unused items improved their crafting skills, sparking creative and innovative thinking. This experience inspired ideas that could potentially lead to entrepreneurial ventures among students. Participants realized that such creative ideas emerge

only when they understand which materials are suitable for recycling. Participants became more aware of the potential to reduce reliance on single-use items and understood the importance of recognizing reusable items around them, reducing the need to purchase new ones when existing resources are available

Changes in attitudes and intentions

The pro-environmental behaviors cultivated through the GREAT program provided participants with a sense of closeness to nature and a heightened empathy for the environment. Applying these behaviors within the school setting contributed to a more comfortable atmosphere for participants and their peers. Following the program, participants reported positive emotions, such as happiness and gratitude, and began viewing pro-environmental behaviors as appealing and valuable. Many came to perceive these actions as not only enjoyable but also intrinsically positive. Inspired by their experience, participants expressed a desire to consistently internalize pro-environmental behaviors and promote them among those around them. They also viewed these actions as a meaningful way to make a small yet impactful contribution to environmental preservation.

Sheeran and Webb (2016) assert that individuals' behaviors are influenced by their intentions to act in specific ways. Additionally, attitudes play a crucial role in shaping environmental behaviors. Palupi and Sawitri (2017) found that a positive attitude toward pro-environmental behaviors encourages individuals to act with greater environmental concern, which is essential for mitigating environmental degradation and fostering sustainability. Similarly, Haryono (2021) identified a positive and significant relationship between environmental attitudes and pro-environmental behaviors.

Changes in pro-environmental behaviors

After participating in the GREAT program, students gained a clearer understanding of implementing pro-environmental behaviors. Initially indifferent to waste issues, participants became more mindful, sorting organic and inorganic waste, and continuing practices introduced during the program, such as recycling waste into crafts and compost for plants. This shift led to a heightened awareness of environmental responsibility, with visible improvements in school cleanliness due to reduced litter.

Additional pro-environmental behaviors, like conserving electricity and water, also became ingrained. Students began consistently bringing reusable bottles, reducing their reliance on single-use plastics at school and beyond. These behaviors evolved beyond personal habits, inspiring participants to encourage friends and family to adopt sustainable practices, and fostering a broader culture of environmental awareness. Participants acknowledged that their engagement in the GREAT program led them to incorporate pro-environmental behaviors not only within the school environment but also as everyday habits outside of school.

The behavioral changes observed in students following their participation in the GREAT program suggest that a learning process took place. Learning is defined as a process through which individuals acquire changes in behavior resulting from experiences and interactions with their environment. In other words, learning can be recognized through observable behavioral changes (Arifin, 2017). Specifically, the direct experience of engaging in GREAT activities

allowed participants to understand the significance of environmental protection, leading to noticeable shifts in their everyday behaviors.

Related factors that support and hinder the changes

Most participants agreed that pro-environmental behaviors are primarily driven by internal motivation, allowing them to maintain these behaviors consistently. They demonstrated knowledge of pro-environmental practices and prosocial values related to the environment. Participants also acknowledged that encouragement from significant others, such as family and friends, plays a critical role in sustaining these behaviors. The influence of environmentally responsible friends, in particular, motivated participants to take their commitment to pro-environmental actions more seriously. Family support, especially from parents, was identified as a significant factor in fostering sustained environmental behaviors.

Participants recognized that common barriers to practicing pro-environmental behaviors include habits like forgetfulness, procrastination, and laziness, which reflect a tendency to prioritize self-interest over the well-being of others or the environment—indicative of egoistic values. However, participants reported that they were able to overcome these obstacles thanks to reminders and encouragement from close friends and family members, who helped them stay committed to pro-environmental behaviors.

Practical Implications

The GREAT activities carried out by all Agents of Change made other students at SMAN X participate in the environmental movement. Students who are not included in Agents of Change also flocked to bring various beverage tumblers from home every day and uploaded them on social media. In addition, kale plants were planted using plastic bottle waste and nurtured to thrive creating a small green garden at school, the produce of which can be consumed by the students. On the other hand, participants who have participated in a series of GREAT activities show pro-environmental behavior not only in the school environment but also at home and in public places. They realize that there is a close relationship between the environment and humans so any action towards the environment will be felt back by humans. Participants view pro-environmental behavior as important to be implemented both in the school environment and outside the school environment.

CONCLUSION

This participatory action research intended to build a model to increase the student's environmental awareness, knowledge and attitude and move it towards pro-environmental action. This research has produced The Green Action (GREAT) program as an intervention model which consists of 5 pro-environmental activities implemented in schools. The implementation of this program applies the principle of involving role models called environmental ambassadors among students. The program is also based on the Theory of Planned Behavior which emphasizes the importance of attitudes, perceptions of behavioral control and subjective norms to encourage behavioral intentions, in this case environmental behavior. In addition, researchers also added the importance of the role of knowledge and personal values in shifting intentions and behavior. The results from the reflection papers and

FGDs indicate that the program was effective in influencing participants' attitudes and intentions and even encouraged the adoption of environmental behaviors both at school and at home.

While this program was successful, there were some limitations regarding the process. There were many participants who dropped out due to the lengthy process. Although the results generally showed an increase in knowledge and a shift in attitudes, the extent to which these changes persisted several months after the program had not been examined. In addition to the drop-out issue, retention of participants during the follow-up period is also important for evaluating the long-term effects of the program. Lacking follow-up data might reduce the strength of research findings in demonstrating the sustainability of program effects. Previous research had highlighted similar issues in this kind of intervention. For example, research by Smith and Jones (2010) shows that interventions often suffer from participant drop-out or similar issues. These findings suggest that additional efforts should be made to address such challenges in the planning and implementation of future interventions.

In addition, while the qualitative data from reflection papers and FGDs provided valuable insights into the program's benefits for students, a more precise understanding of the changes could be achieved by implementing a pre-test before and a post-test after the program to enable comparative analysis. Moving forward, quantitative data on the program's effectiveness will be essential.

Given the limitation of the current program, the implementation of this program positively impacted students by fostering changes in knowledge, awareness, attitudes, intentions, and pro-environmental behavior. Additionally, the program highlights forms of environmental action that Generation Z can adopt, distinct from those of previous generations, as it emphasizes the roles of social media, creativity, and collective action within peer groups. Therefore, researchers in this field are encouraged to further test this intervention model in various schools, adjusting areas identified for improvement. Testing across multiple schools would enhance the program's generalizability and allow it to be established as a model intervention for promoting pro-environmental behavior in educational settings. This model could then be proposed to relevant authorities, such as the Ministry of Education and Culture, as a curricular strategy for fostering sustainable practices. Additionally, researchers may consider applying the model in other contexts beyond schools to evaluate its effectiveness in encouraging pro-environmental behavior among youth. Incorporating other psychological theories and considering cultural aspects in the intervention's development may also enhance its applicability and effectiveness in future applications.

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