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Article

How does education and mindfulness matter to high school student's pro-environmental behaviour?

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ABSTRACT

Indonesia is one of the largest marine debris disposal countries in Asia. Due to its open dumping garbage disposal scheme and the growing population of productive age and educated demographic, there is a heightened urgency to develop an education model as a practical solution. This study aims to develop an education model that combines education and mindfulness to achieve environmental competency using a pretest-posttest control group design. The target population is 96 students in classes 11 and 12, and they are divided randomly into 2 groups called the experiment group which got the intervention and the control group which did not get any intervention. The intervention given to the experimental group was built on social learning theory and adapted to the environment and socio-culture of Jakarta, Indonesia. Pretest and posttest questionnaire were used and analyzed using t-test, paired samples t-test, and one-way ANOVA. The results shows that environmental education and mindfulness influence positively pro-environmental behaviour, and there are significant differences in posttest result of the experimental group. Our experiment demonstrates education and mindfulness can simultaneously cultivate and sustain environmental competency.

Keywords:

Mindfulness,
Environmental education,
Student behaviour,
Mindful living,
Mindfulness in education

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Introduction

With a dense population and high mobility, Jakarta, the capital city of Indonesia, has become the center of development. One of the impacts of population density in an area is the amount of garbage residents produce due to increased consumption and production activities (Saputro, 2021). Bantargebang Integrated Garbage Disposal Site (TPST), Jakarta's garbage management, occupies an area of 110.3 hectares and reaches an alarming height of 40 meters (equivalent to a 16-story building). The daily average garbage that enters Bantargebang ranges from 7,500 to 7,800 tons, approaching the site's maximum capacity (CNN Indonesia, 2022). Indonesia's garbage problem has become a big concern, primarily because it still uses an open dumping method, resulting in land-based garbage accumulation and water pollution (Hendra, 2016). Indonesia is among the eight Asian countries with the highest levels of plastic pollution in the sea (Hermawan & Astuti, 2021). The low level of public environmental awareness is very evident as littering and the proliferation of illegal settlements along riverbanks still commonly occur (Karuniastuti, 2013).

Pro-environment behaviour refers to a set of actions undertaken to support positive changes to the environment and reduce negligence that harms it. This behaviour is influenced by an individual's self-identity and biospheric values (Bouman, Steg, & Zawadzki, 2020; Yusliza et al., 2020). Schools

have a significant role as the root of fostering ecological character development (Wardani, Wiryono, & Susatya, 2020). Curriculum planning can shape the characters of both teachers and students, encouraging pro-environmental behaviour both inside and outside the school (Paramita, Indiyati, Ndaruhadi, & Nuyman, 2017). However, environmental knowledge does not guarantee pro-environmental behaviour. This is because there is often an "attitude-behaviour gap", the inconsistency between an individual's attitudes or beliefs and their actual behaviours or actions, which happens because of the perceived sacrifices of time, energy, and money required to take environmentally friendly actions (Kyselá, 2015; Saari, Damberg, Frömbling, & Ringle, 2021; Y. Wang, Hao, & Liu, 2021).

Indonesia is currently experiencing a demographic bonus; the Central Bureau of Statistics 2021 data shows that 69.28% of Indonesia's population falls within the productive age (15-64 years old) (BPS-Statistics Indonesia, 2022). Given this demographic trend, greater attention should be paid to improving education quality (Sutikno, 2020). It's worth noting that individuals in the 16-25 age group exhibit lower levels of pro-environmental behaviour compared to those in the 36-45 and 45-55 age groups (Wardani et al., 2020). Therefore, there is a need to shape the perceptions of the younger generation in order for environmental education to seamlessly adapt to new developments in the fields of environment, politics, economy, and culture (Boca & Saraçli, 2019). The rapid impact of climate change has led academics to recognize that traditional theoretical and practical knowledge is insufficient in addressing these changes. Consequently, there is a pressing need for environmental education curriculum changes that incorporate interdisciplinary learning modules integrated into a knowledge system that addresses climate change issues (Afandi, 2013; Yu & Chiang, 2018).

Established through the Ministry of Environments under Number 5 of 2013, the Adiwiyata Program aims to shape a culture and character of responsibility for environmental management among all school residents. This program aligns with the government's goal of achieving sustainable development (Wardani et al., 2020). The weakness of the 2013's education curriculum on ecological issues is the low public participation and lack of understanding of current problems in environmental education (Prihantoro, 2014), weak government policies, a weak national education system, and an inability to adopt system changes that lead to new guidelines (Sudjoko et al., 2011). Previous research on the environmental program's success rate showed that the program succeeded in increasing pro-environmental actions (Nurwidodo, Amin, Ibrohim, & Sueb, 2020; Nuzulia, Sukamto, & Purnomo, 2020; Pradini, Sudjanto, & Nurjannah, 2019). But there are still students who have not been able to behave and follow the program (Azmi & Elfayetti, 2017; Munawar, Heryanti, & Miarsyah, 2019). Schools that do not have an environmental program compared to schools with a systematic environmental program show higher ecological literacy in the schools with the environmental program; however, there is no difference in attitude towards preventing environmental damage in both schools (Rahmadiani, Utaya, & Bachri, 2019). Students who are not from schools with an ecological program can gain knowledge from extracurriculars, social media, or extramural education. This may lead to similar attitudes and actions (Iswari & Utomo, 2017).

Furthermore, research has shown a significant relationship between mindfulness and pro-environmental behaviour. Mindfulness suitably complements educational methods (Geiger, Grossman, & Schrader, 2019), thus this means that mindful individuals are more likely to engage in pro-environmental actions (Ray, Franz, Jarrett, & Pickett, 2020). Buddhist practices in mindfulness and meditation can lead to spiritual development for personal and social transformation (Lim, 2019). This helps to bridge a change for the next generation to think and relate to nature (Javanaud, 2020). In this case, the importance of environmental education and mindfulness contributes to students' pro-environment behaviour, which is also illustrated in Buddhist school students, the research subject. The researcher conducted preliminary experimental studies involving Grade 11 and 12 students of Buddhist High School located in West Jakarta. Several things concerning environmental education are integrated into science (Natural Science) lessons at the middle and high school levels.

Preliminary observational data shows that students have not yet exhibited pro-environmental behaviour, as many students consumed bottled water, used single plastic bags in canteens, and

disposed of garbage without sorting it properly. To measure their effect on pro-environmental behaviour, researchers intervened in experimental groups to measure their knowledge of environmental education and mindfulness. This study aims to measure the consequences of interventions so that environmental learning models can be developed to create a generation that responds to environmental problems. According to Law No. 32 of 2009, article 65, paragraph 2 states that all levels of society have the right to the opportunity to obtain environmental education. The Adiwiyata ecological program is still a guideline for the school curriculum (Setyobudi & Marsudi, 2018), with educative, participatory, and sustainable principles followed by all school components, following the Minister of Environment Regulation Number 5 of 2013 (Diyan Nurvika Kusuma Wardani, 2020).

The traditional approach to social learning principles considers behaviour as a unity strongly influenced by childhood upbringing and parental figures. In contrast, social learning theory offers a departure from conventional methods by introducing additional control variables and more intricate models for transmitting behaviour. According to social learning theory, behaviour isn't merely a direct response to environmental stimuli; instead, it results from the interplay between the environment and an individual's cognitive processes (Bandura, 1969). In 1986, Bandura renamed the social learning theory into social cognitive theory, evolving it into a more advanced model for studying how individuals behave based on their cognitive abilities (Nabi & Prestin, 2017). Observation plays a crucial role in learning how and why humans learn using two representative systems: imagination and verbalization. These systems store the stimulus model as images and words in our memories, serving as a mediator when recalling these elements to replicate the observed action (Bandura, 1969). The observation mechanism in learning comprises four key processes: attention, retention, motor reproduction, and motivation. Observing and modeling shows that individuals often resort to imitation (Bandura, 1969). In social learning theory, cognition doesn’t solely emerge from learning (Firmansyah & Saepuloh, 2022); in other words, knowledge does not guarantee that behaviour will align with learning outcomes. This theory distinguishes between the process of learning and subsequent behaviour. This shows that individuals learn by observing others around them, emphasizing that learning is an internal process that may or may not lead to behaviour change (Razieh Tadayon Nabavi, 2016).

In environmental education, it is crucial to define the expected behaviour clearly. Failure to do so may lead to students not exhibiting the desired behaviour when faced with an unexpected stimulus. For instance, an ecological educator may teach students to sort garbage using bins of different colors to foster behaviour change in recycling. However, if students are primarily tied to the color of the bins rather than the concept of recycling, they may dispose of their trash improperly when encountering only one bin (Heimlich & Ardoin, 2008). This highlights that the outcome of environmental education should ideally be a shift in ecological mindset. Researchers often use the New Environmental Paradigm (NEP) as a questionnaire to measure environmental mindset. Initially developed by Dunlop and Liere, NEP was rooted in Rachel Carson's Dominant Social Paradigm (DSP), and emerged in the 1970s as a publication that developed valid and reliable measurements for environmental concerns. 8 years later, in 1987, Dunlop developed it into NEP then later refined it again in 2000. NEP uses the Likert scale with five options: strongly agree, agree, unsure, disagree and strongly disagree. However, NEP has received critisizm that it only captures one dimension of a statement while overlooking three or more other dimensions (Anderson, 2012a). NEP measures 3 key dimensions: (1) anti-anthropocentrism, (2) limit to growth, and (3) balance of nature (Ihsyaluddin, 2013)sss.

This practise of mindfulness has been widely adopted by the Western world when Jon Kabat Zinn introduced the Mindfulness-Based Stress Reduction (MBSR) program in 1979, primarily as a treatment medium to reduce pain and stress. The roots of mindfulness traces back 2,500 years back to Buddhism, where it held such significance that it became the central component of Right Mindfulness (Samma-sati) in the Buddhist path (Bodhi, 2011). In the Mahasatipatthana Sutta, the Buddha states that one path to purify beings, overcome sorrow, dispel sadness, and be on the right path toward Nibbana is through the four foundations of mindfulness. These foundations of mindfulness are contemplation of the body, feelings, mind, and mental objects (M.1.156).

Mindfulness is a central and fundamental work in Buddhism, lying at the heart of Buddhist meditation (Nyanaponika, 1962), it can be cultivated and developed through meditation (Kabat-Zinn, 2003). Mindfulness learning and practice consist of three elements, which are the cultivation of mindfulness using a structured approach includes engaging in formal mindfulness exercises; an attitude characterized by kindness, curiosity, and a willingness to be fully present with an open mind; and comprehension of human susceptibility (Surya, Wibowo, & Mulawarman, 2021).

The term "Samma" which means right, in the context of Buddhist Mindfulness, is not an ethically neutral practice but carries connotations of either being right (kusala) or wrong (akusala) (Nyanaponika, 1962). The vision of kusala and akusala is a paññā (wisdom) function, which presents knowledge of an action's causes, conditions, effects, and implications. The purpose of the action (whether it leads to enlightenment) and provides a deeper understanding about things as they are (Kang & Whittingham, 2010). The development of wisdom is the chief task of mindfulness (Surya, 2019). The secular concept of mindfulness inherently involves the avoidance of discrimination and judgment, as these elements can lead to distortion when combined with the mindfulness teachings of Buddha. In Buddhism, mindfulness is an integral aspect of the Noble Eightfold Path and must be integrated with the right view (sammā-diṭṭhi) and right effort (sammā-vāyāma). Mindfulness practitioners must possess the mental qualities necessary to distinguish between good and bad things (Bodhi, 2011). Nhat Hahn (1998) pioneered mindfulness and popularized the concept of interbeing, a non-dualistic awareness between humans and their natural surroundings (Bai & Scutt, 2009). To illustrate, consider the concept of a table: it needs the presence of wood, a carpenter, time, expertise, and many other supporting factors for its formation. Each cause is connected to another in an ongoing relationship: wood needs forests, sun, rain, air, so on and so forth (Lim, 2019).

Mindfulness is not a natural quality humans possess but a mental attribute that must be cultivated. Mindfulness grows when the cognitive processes move away from spontaneous or hasty actions (Bodhi, 2011). Mindfulness can facilitate openness to behavioural change; when individuals engage in activities with full attention, it has the potential to guide their focus toward environmental conservation (Et al., 2021). Mindfulness can activate altruism (Iwamoto et al., 2020), bringing clarity of thoughts, focus, and creativity (Burmansah et al., 2019), increasing empathy (Umniyah & Afiatin, 2009), feelings of compassion, humanity, and self-balance (Wallmark, Safarzadeh, Daukantaitė, & Maddux, 2013). Researchers often use the Five Facet Mindfulness Questionnaire (FFMQ), developed by Baer in 2003, for the mindfulness measurement scale. FFMQ measures five aspects that Mindfulness influences: Observing, describing, acting with awareness, not judging the inner experience, and not reacting to the inner experience (Meng, Mao, & Li, 2020; Taylor & Millear, 2016).

Critics of FFMQ argue that it does not represent the roots of Buddhism's teachings on mindfulness, and is not reflected in the measurable constructs of Buddhist psychology. FFMQ only explains the psychological aspects of human beings (Chiesa, 2013) and does not consider the essential elements of Buddhism arising from wisdom, Buddhist ethical behaviour, compassion, and sympathy (R. Baer, 2019). It is in the interest of science to measure every aspect in a uni-dimensional sub-scale (R. A. Baer et al., 2008). Although mindfulness training is adapted from the Buddhist meditation tradition, mindfulness has become a psychological medium for attention and awareness (R. Baer, 2019). FFMQ has been developed into a measurement instrument that has passed validity and reliability tests and can adapt to changes well so that the effect of the error is relatively small (Bohlmeijer, Klooster, Fledderus, Veehof, & Baer, 2011). Florian G. Kaiser developed General Ecological Behavior (GEB), a measurement scale of commitment to pro-environmental behaviour that uses specific environmental questions regarding human behaviour. This research uses the five dimensions of GEB: prosocial behaviour, ecological garbage removal, water and power conservation, ecologically aware consumer behaviour and garbage inhibition (Kaiser, 1998).

Previous research using the NEP and GEB scales of Adiwiyata-based school students in Ponorogo showed that the dimensions of the NEP and GEB scales correlated and could be applied through Adiwiyata schools and research adapted to Indonesian culture(Diyan Nurvika Kusuma Wardani, 2020), and the six dimensions of the GEB scale can be applied in Indonesia (Febriyanti, 2016). A

Research conducted on students of an elementary school that applied Albert Bandura's social cognitive theory shows that the concept of pro-environmental behaviour of teachers and principals is a good model for motivation and reinforcement to motivate students to implement pro-environmental behaviour (Purnaningtyas & Fauziati, 2022). Experimental research conducted on elementary school students with the help of presentation methods and surveys of the surrounding environment did not produce differences in pro-environmental attitudes (Adriansyah, Sofia, & Rifayanti, 2019) and gender research shows that gender does not influence pro-environmental behaviour (Shadiqi, Heryati Anward, & Erlyani, 2016).

Previous studies have indicated that mindfulness has an influence on healthy living behavior and pro-environmental behavior, as measured by the GEB scale, suggesting that mindful individuals tend to exhibit ecologically related behavior that coincides with improved healthy living (Geiger, Otto, & Schrader, 2018). A quantitative meta-analysis of the relationship between mindfulness and nature using the FFMQ scale shows a significant correlation between mindfulness and nature (Schutte & Malouff, 2018). Research on Buddhist meditation practices and pro-environmental behaviour, conducted with quantitative methods, demonstrates a connection between trait mindfulness, pro-environmental behaviour, and belief in climate change (Panno et al., 2018).

Method

Research Framework and Hypothesis

Based on the background mentioned above, the researchers have formulated the hypotheses for this study as follows:

H1: Environmental education positively influences high school students' pro-environmental behaviour.

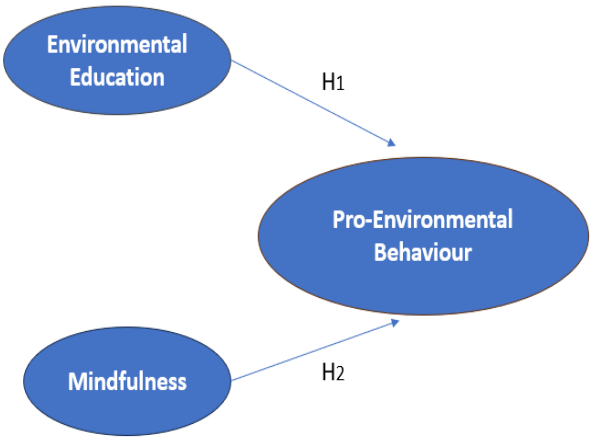
H2: Mindfulness positively influences high school students' pro-environmental behaviour.

H3: There is a difference in pro-environmental behaviour before and after the intervention in the experimental group of high school students.

H4: There is a difference in pro-environmental behaviour before and after the intervention in the control group of high school students.

H5: There is a difference in pro-environmental behaviour between the experimental and control groups before the intervention among high school students.

H6: There is a difference in pro-environmental behaviour between the experimental and control groups after the intervention among high school students.



H1 = Hypothesis 1
H2 = Hypothesis 2

Figure 1. Research Framework and Hypothesis

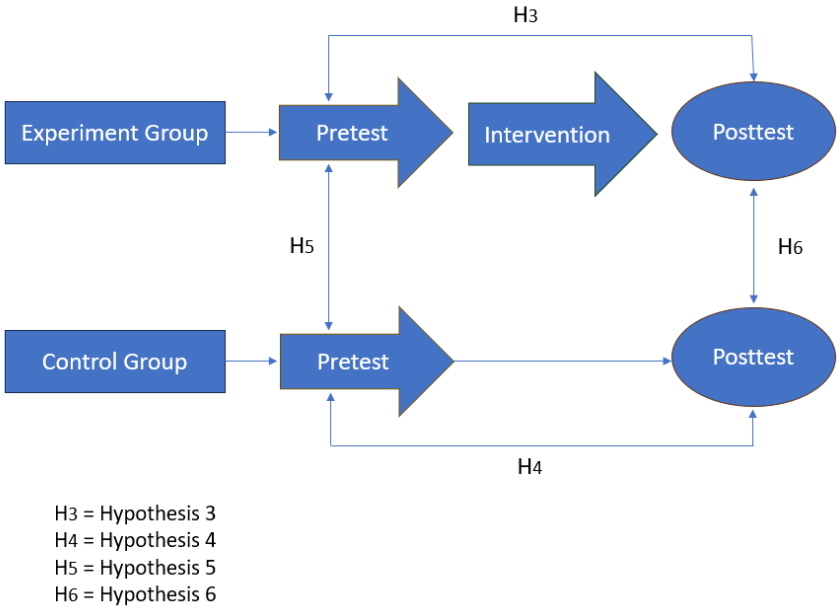


Figure 2. Experimental Research and Hypothesis

Research Design

This study used the experimental pretest-posttest control group design on a population of grade 11 and 12 students totaling 96 people. The students were divided into two groups of 48 students called the experimental group and the control group. The intervention was carried out only for the experimental group for five days, the first three days of the new school year as students are introduced to the school environment and two days on the weekend. The control group did not get any intervention and they followed the school program. The validity test of question items was conducted on 30 students of grade 12 in the previous semester who have graduated 1 month before the new school year started. Minimum sample for validity and reliability test is 30 (Sugiyono, 2020). Testing the validity and reliability of the instrument was carried out with the help of the SPSS program version 27—Pearson Product Method with α = 0.05 and rtable 0.361. If the rcount is greater than rtable, it is declared valid. Cronbach's alpha score >0.7 was used to indicates reliability (Lehman & Rourke, 2005).

Research Instrument

The research instrument used was a questionnaire consisting of 65 questions, that includes 12 inquiries related to the independent variable of environmental education (NEP scale) developed by Dunlop (Anderson, 2012b), 26 questions related to the independent variable of mindfulness (FFMQ scale) developed by Baer (Taylor & Millear, 2016) , and 27 inquiries about the variables associated with pro-environmental behaviour (GEB scale) developed by Kaiser (Kaiser, 1998).

Table 1. Validity and Reliability Test Result

Variable	Scale	Likert scale	Valid Questions	Cronbach's Alpha
Environmental Education	NEP	1-5	12	0.709
Mindfulness	FFMQ	1-5	26	0.880
Pro-Environmental Behaviour	GEB	1-5	27	0.899

Source: Research Data

Research Experiment Test

On the first day, the pretest was applied to 96 children, and then the population was randomly divided

into an experimental group and a control group. The experimental group of 48 students had the intervention for five consecutive days; the first three days lasted about 4 to 5 hours, and the last two lasted about 7 hours. The control group of 48 students stayed in other classrooms. The posttest was conducted two days after the intervention ended, and the posttest was done on 96 students.

Table 2. Research Work Unit for Environmental Education and Mindfulness Variables

Day	Session	Speakers	Education Lesson Materials	RWU
Day -1	Session-1	Research Center for Advanced Chemistry-BRIN (Mr. Dr. Muhammad Ghozali)	1. Garbage Management Performance Achievements in 2022 2. Types of packaging materials 3. Plastics and plastic cycles 4. Curative vs preventive	EET
	Break-time			
	Session-2	Research Center for Advanced Chemistry-BRIN (Mr.Dr. Muhammad Ghozali)	1. Linear economy 2. National medium-term development plan 2020-2024 3. Circular economy 4. Garbage banks and polling stations 5. Sarimulya Garbage Bank	EET
	Session-3	Education Team of Tzu Chi recycling center (Mr. Jok Khian)	1. Top 5 countries that dump plastic garbage into the ocean 2. Effects of garbage on marine ecosystems 3. Waste segregation with 5 R	EET
	Session-4	YouTube Channel	1. On Marissa' Mind Mindfulness 2. Mindful eating practice - Practicing food mindfulness	Mindfulness
	Session-5	Lunch	Practice mindful eating	Mindfulness
Day-2	Session-1	Kalpataru Winner: neighborhood of 06 Aries Park (Mr. Widyatmoko. S)	1. 06 Aries Park's neighborhood's vision and mission, Meruya West Jakarta 2. Go green movement 3. Composting residents' organic garbage 4. Farming organic garbage eating animals: guinea pigs and geese 5. Biogas from residents' organic garbage	EET
	Session-2	YouTube Channel	1. A Whale's Massage from the Deep 2. Kamikatsu, A Zero Garbage Town in the Land of Sakura 3. To be Means to InterBE Thich Nhat Hanh	EET Mindfulness
	Session-3	Lunch	Practice mindful eating	Mindfulness

Day - 3	Session-1	Team Edukasi World Wide Fund (WWF) Indonesia	1. Changes in consumption behaviour during the Covid-19 pandemic 2. Environmental impact on the human population of 7.8 billion 3. Buy sustainably products 4. The role and journey of consumption 5. Buy local, durable, ecolabel goods 6. Your trash, where do you want to take it?	EET
	Session-2	YouTube Channel	Eating Meditation: An Introduction by Brother Freedom	Mindfulness
	Session-3	Lunch	Practice mindful eating	Mindfulness
Day - 4	Session-1	Outdoor learning (Bantar Gebang Landfill - Bekasi) Environmental Service Officer	1. Landfill observation 2. Q&A with Environment Agency officers 3. Create video testimonials next to garbage generation	EET
	Session-2	Lunch	Practice mindful eating	Mindfulness
	Session-3	Outdoor learning (Tzu Chi Recycling Center, Medang) Tzu Chi Depot Volunteers	1. Practice sorting garbage for 1 hour by dividing students into four groups 2. Listening to Master Cheng Yen's lecture on the Recycling Bodhisattva 3. Q&A with Tzu Chi Depot volunteers	EET
Day -5	Session-1	One Day Mindfulness (ODM) - Training Team of Plum Village	1. Mindful Singing 2. Orientation 3. Mindful Sitting (recognizing breath, body, and feelings) 4. Touching the Earth (related to Earth preservation) 5. Mindful Walking 6. Mindful Games 7. Eating meditation (brief orientation) 8. Total relaxation 9. Counseling and Dhamma sharing	Mindfulness

Source: Research Data

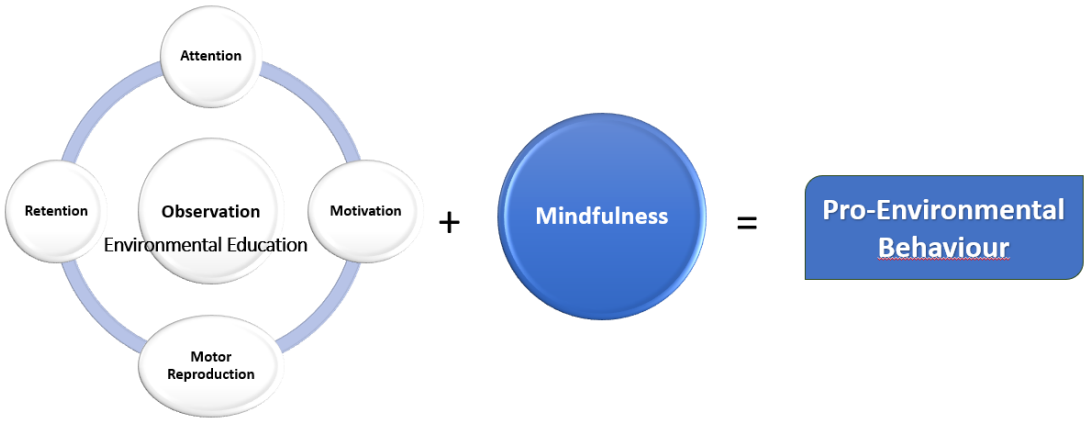


Figure 3. Theories and Framework of Intervention

The intervention in the experimental group was structured as a research work unit built upon the principles of social learning theory and Buddhist mindfulness doctrine. The core of social learning theory is observation, followed by modeling and imitation (Firmansyah & Saepuloh, 2022; Razieh Tadayon Nabavi, 2016). Resource persons served as the models observed by students during the modeling process. In this study, the resource persons were highly competent in their respective fields and capable of presenting engaging topics suitable for the students' age group. The research work unit comprised eight environmental education sessions and eight mindfulness sessions held on different days. While these two components may seem like separate treatments, they are integrated because students were consistently encouraged to practice mindfulness. The concept of Buddhism, the mind is the leadear (Dh.1) is the main link for pro-environmental behaviour. The learning materials encompassed indoor theoretical instruction for three days and outdoor activities for two days. The first outdoor activity was visiting Bantargebang and Tzu Chi recycling centre. The purpose was to provide students firsthand experience of waste generation in mountain garbage. This approach aimed to enhance students' attention and retention by engaging their senses of sight and smell amidst the garbage generation process, at the same time, activated their mindfulness of their five senses.

Furthermore, practicing garbage sorting at Tzu Chi Recycling Depot was intended to reinforce students' motor skills and motivation. Resource persons allocated time in each learning session for students to ask questions. At the conclusion of the environmental education sessions, students shared testimonials and expressed their commitment to reduce garbage generation in Bantargebang. The last day of intervention was Sunday and one day mindfulness was held in a temple close to the school. One day mindfulness sessions included types of meditation and mindful training, the session ended with counseling and dhamma sharing. (Dh.1, 2000)The students of the control group stuck to the school's introduction program, stayed in the classes for the first three days and had a holiday weekend.

Results and Discussion

By testing data to prove the H1 and H2 hypotheses, the results used pretest data of 96 students for all three variables. Technical data analysis shows normality test with Kolmogorov-Smirnov test with probability value sig. (2-tailed) 0.200 > 0.05, this shows normally distributed residual data and is a good regression model. The multicollinearity test shows a tolerance of 0.814 > 0.1 and a VIF of 1.228 < 10, indicates no correlation between the independent variables.

A T-test was done to test whether an independent variable partially affects the dependent variable (YE). The table shows sig. variables XE1 = 0.000 < 0.05 and XE2 = 0.005 < 0.05. The analysis showed that both independent variables partially positively affected the YE-bound variable. The higher the XE1 or XE2, the higher the YE. The independent variable XE1 (environmental education) with a count of 3.757 > table 1.660, then H1 is accepted, and H0 is rejected. The independent variable XE2 (mindfulness) with a count of 2.889 > a table of 1.660, then H2 is accepted, and H0 is rejected.

Table 3. The T-test With Student Pretest Data
Coefficients a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.256	.349	-	3.596	.001	-	-
Environmental Education Pretest (XE1)	.369	.098	.362	3.757	.000	.814	1.228
Mindfulness Pretest (XE2)	.238	.082	.279	2.889	.005	.814	1.228

Dependent Variable: Pro-Environmental Pretest (YE)
Source: Research Data

Table 4. Paired Samples Test (Experimental Group)

Pair	Variable	Comparison	p Value	Sig. (2-tailed)
Pair 1	Pro-Environmental Behavior (Y)	YE – YO	p < 0.05	0.000
Pair 2	Environmental Education (X1)	XE1 – XO1	p < 0.05	0.008
Pair 3	Mindfulnes (X2)	XE2 – XO2	p < 0.05	0.018

Source: Research Data

The pairwise difference test in the experimental group shows a difference between the results of the pretest and posttest questionnaires for the three variables. The comparison of YE (pro-environmental behaviour pretest) to YO (pro-environmental behaviour posttest) shows sig. 0.000 < 0.05, XE1 (environmental education pretest) against XO1 (environmental education posttest) indicates a sig of 0.008 < 0.05, XE2 (mindfulness pretest) against XO2 (mindfulness posttest) indicates a sig. 0.018 < 0.05. This statistical analysis shows that all Research Work Units (RWU) outlined in the intervention resulted in a change in mindset in environmental education, mindfulness, and pro-environmental behaviour, then the H3 hypothesis was accepted, meaning that there were differences before and after the intervention in the experimental group. In Social Cognitive Theory, Bandura (2002) states that the ability of humans to adapt and change is rooted in the social system (Singhal, Cody, Rogers, & Sabido, 2003). Humans learn based on observations of the surrounding environment, other human behaviours, and cognitive factors that influence their development within reciprocal relationships. The three interacting determinants are individual efficacy, the response received to the behavior, and support from the surrounding environment (Zhou, Molly & Brown, 2015). The observational aspect in mindfulness, which prioritizes attention to the body and the surrounding environment, significantly contributes to pro-environmental behavior because it enhances empathy and self-compassion (Centeno & Fernandez, 2020). Mindfulness can be cultivated and promote well-being in individuals (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). Therefore, mindfulness is highly recommended to be incorporated into environmental education (Geiger et al., 2018).

The control group did not get any intervention, the paired difference test in the control group shows no difference between the results of the pretest and posttest questionnaires for the three variables. The comparison of YE to YO shows sig. 0.090 > 0.05, XE1 against XO2 indicates a sig of 0.109 > 0.05, XE2 against XO2 indicates a sig. 0.212 > 0.05. This statistical analysis showed that the control group was not affected by the intervention carried out by the researchers because the intervention was conducted in the room only for experimental group students. The control group stayed in

different room within the intervention and got holiday weekend while the experimental group got the outdoor learning for the intervention program. We reject H4 and accept H0 because there is no difference between the control group before and after the intervention.

Table 5. Paired Samples Test (Control Group)

Pair	Variable	Comparison	p Value	Sig. (2-tailed)
Pair 1	Pro-Environmental Behavior (Y)	YE - YO	p < 0.05	0.090
Pair 2	Environmental Education (X1)	XE1 - XO1	p < 0.05	0.109
3	Mindfulness (X2)	XE2 - XO2	p < 0.05	0.212

Source: Research Data

Table 6. Test Variable Difference Before Intervention (YE, XE1, XE2) Between Experimental and Control Groups

Variable	Significance value	Sig.
Pro-Environmental Behavior Pretest (YE)	< 0.05	0.879
Environmental Education Pretest (XE1)	< 0.05	0.647
Mindfulness Pretest (XE2)	< 0.05	0.516

Source: Research Data

Pretest was held for 96 students before they were randomly divided into two groups, the results of the independent difference test with the one-way ANOVA table show no difference between the experimental group and the control group on the pro-environment variable (YE) pretest. Sig YE value 0.879 > 0.05. Environmental education variables pretest (XE1) sig 0.647 > 0.05. The mindfulness pretest (XE2) variables of 0.516 > 0.05 also indicate that there is no significant difference in the two independent variables during the same time period for both experimental and control groups. Therefore, we reject H5. This analysis suggests that both groups started with a similar baseline during the pretest, prior to the intervention, and shared a common perception of the independent and dependent variables.

The one-way ANOVA test was conducted to examine the differences in all posttest variables simultaneously between both groups of students. Pro-environment posttest (YO) behavior variable yields a very small sig value of 0.000 < 0.05. This suggests that the pro-environment behavior of the experimental group has a significant difference from the control group as a result of the intervention undertaken by the researchers. Consequently, the H6 hypothesis is accepted. The environmental education variable (XO1) has a sig value of 0.052, which shows no difference with a sig close to 0.05. The pretest comparison between experimental group and control group has a sig value of 0.647 for XE1 that > 0.05, which means there is no difference between two groups at the starting point.

The change in pretest sig value of 0.647 with posttest sig 0.052, shows that there has been a change in value between the control group and the experiment group. This is confirmed by the control group paired difference test results for the pretest and posttest variable X1 (XE1-XO1) of sig 0.109, which shows no difference. The mindfulness posttest (XO2) variable with a sig value of 0.038 showed a difference between the control group's mindfulness posttest (XO2) and the experiment group. It can be concluded that the mindfulness variable has a greater impact on YO compared to the environmental education variable.

This research validates Bandura's theory in social cognitive learning, which proves that learning is an internal process and does not necessarily equate to behaviour change. Cognition does not solely result from learning but emerges from the interaction within the learning process (Firmansyah & Saepuloh, 2022; Razieh Tadayon Nabavi, 2016). Mindfulness has the capacity to enhance empathy, and both empathy and sympathy play pivotal roles in fostering students' pro-environmental sentiments. Empathy is also essential in social relationships; as emotional connections with fellow

humans and nature form the foundation for pro-social actions (Chawla, 2009). Mindfulness can also internally and externaly argue an individual's belief in climate change (Y. Wang et al., 2021). The relationship between mindfulness and climate change is mediated by an increasing level of connection with the environment (J. Wang, Geng, Schultz, & Zhou, 2019). Environmental education must give students space to experience "internal driving and external guiding" (Radcliffe, Wilson, Powell, & Tibbetts, 2008).

Table 7. Test of Variable Difference After Intervention (YO, XO1, XO2) Between the Experimental Group and Control Group

Variable	Significance value	Sig.
Pro-Environmental Behavior Posttest (YO)	< 0.05	0.000
Environmental Education Posttest (XO1)	< 0.05	0.052
Mindfulness Posttest (XO2)	< 0.05	0.038

The combination of environmental education and mindfulness sharpens the mind and leads to mindful consumption. Students are expected to be aware of shopping priorities, have self-regulate shopping choices (Bahl et al., 2016), and use the "less is more" approach to consider consumption desire (Nixon, 2016). Mindfulness can serve as the anchor of action for individuals since, under routine circumstances, actions tend to occur automatically and are influenced by the unconscious mind (mindlessness). When mindfulness becomes the anchor, actions can transcend the cognitive processes of automation (J. Wang et al., 2019). The intervention is expected to benefit for students to comprehend the consuming and disposing of waste, carbon emissions, residues and the consequences resulting from the production things, including how to handle the packaging which ultimately becomes waste.

Conclusion

Environmental education and mindfulness positively influence pro-environmental behaviour. The intervention shows that the experimental group experienced changes in pro-environmental behaviour, knowledge of ecological education outcomes, and mindfulness. There is no impact on the control group because they did not get any intervention. The intervention was conducted through a series of educational activities that combined environmental knowledge with a sustainable and mindful living, ensuring that students engaged in these research activities daily. Environmental education curricula should encompass disciplines beyond science to impact students' cognitive development. Integrating breakthroughs in theoretical classroom learning with outdoor activities are crucial for presenting real-world facts and clearly defining students' expected roles. Mindfulness proves to be more significant than environmental education in transforming students' pro-environmental behaviour. Knowledge alone does not necessarily translate into behaviour change, but mindfulness can cultivate and guide students towards pro-environmental actions.

References

Afandi, R. (2013). Integrasi Pendidikan Lingkungan Hidup Melalui Pembelajaran IPS di Sekolah Dasar Sebagai Alternatif Menciptakan Sekolah Hijau. *Pedagogia: Jurnal Pendidikan*, 2(1). https://doi.org/10.21070/pedagogia.v2i1.50

Anderson, M. (2012). New Ecological Paradigm (NEP) Scale. *The Berkshire Encyclopedia of Sustainability*.

Azmi, F., & Elfayetti, E. (2017). Analisis Sikap Peduli Lingkungan Siswa Melalui Program Adiwiyata Di SMA Negeri 1 Medan. *JURNAL GEOGRAFI*, 9(2). https://doi.org/10.24114/jg.v9i2.6901

Baer, R. (2019). Assessment of Mindfulness by self-report. *In Current Opinion in Psychology* (Vol. 28). https://doi.org/10.1016/j.copsyc.2018.10.015

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. G. (2008). Construct Validity of the Five Facet Mindfulness Questionnaire in Meditating and Nonmeditating Samples. *Assessment*, 15(3). https://doi.org/10.1177/1073191107313003

Bai, H., & Scutt, G. (2009). Touching the Earth with the Heart of Enlightened Mind: The Buddhist Practice of Mindfulness for Environmental Education. *Canadia Journal of Environmental Education*, 14.

Bandura, A. (1969). *Social-Learning Theory of Identificatory Processes*. In Handbook of Socialization Theory and Research.

Boca, G. D., & Saraçli, S. (2019). Environmental Education and Student's Perception, for Sustainability. *Sustainability (Switzerland)*, 11(6). https://doi.org/10.3390/su11061553

Bodhi, B. (2011). What does Mindfulness Really Mean? A Canonical Perspective. *Contemporary Buddhism*, 12(1). https://doi.org/10.1080/14639947.2011.564813

Bohlmeijer, E., Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Psychometric Properties of the Five Facet Mindfulness Questionnaire in Depressed Adults and Development of a Short Form. *Assessment*, 18(3). https://doi.org/10.1177/1073191111408231

Bouman, T., Steg, L., & Zawadzki, S. J. (2020). The Value of What Others Value: When Perceived Biospheric Group Values Influence Individuals' Pro-Environmental Engagement. *Journal of Environmental Psychology*, 71. https://doi.org/10.1016/j.jenvp.2020.101470

Burmansah, B., Rugaiyah, R., & Mukhtar, M. (2019). A Case Study of Mindful Leadership in An Ability to Develop Focus, Clarity, and Creativity of the Buddhist Higher Education Institute Leader. *International Journal of Higher Education*, 8(6). https://doi.org/10.5430/ijhe.v8n6p57

Chiesa, A. (2013). The Difficulty of Defining Mindfulness: Current Thought and Critical Issues. *Mindfulness*, 4(3). https://doi.org/10.1007/s12671-012-0123-4

Et al., C. K. (2021). Zero Garbage Management through Mindful Consumption for Sustainable Garbage Solution. *Psychology and Education Journal*, 58(1). https://doi.org/10.17762/pae.v58i1.918

Febriyanti, C. (2016). Pengembangan Skala Pengukuran Perilaku Pro Lingkungan: General Ecological Behavior (GEB) Scale. *Jurnal Pengukuran Psikologi Dan Pendidikan Indonesia*, 2(2).

Firmansyah, D., & Saepuloh, D. (2022). Social Learning Theory: Cognitive and Behavioral Approaches. *Jurnal Ilmiah Pendidikan Holistik* (JIPH), 1(3).

Geiger, S. M., Grossman, P., & Schrader, U. (2019). Mindfulness and Sustainability: correlation or causation? *Current Opinion in Psychology* (Vol. 28). https://doi.org/10.1016/j.copsyc.2018.09.010

Heimlich, J. E., & Ardoin, N. M. (2008). Understanding Behaviour to Understand Behaviour Change: a literature review. *Environmental Education Research*, 14(3). https://doi.org/10.1080/13504620802148881

Hendra, Y. (2016). Perbandingan Sistem Pengelolaan Sampah di Indonesia dan Korea Selatan: Kajian 5 Aspek Pengelolaan Sampah. *Aspirasi*, 7, 77–91.

Hermawan, S., & Astuti, W. (2021). Penggunaan Penta Helix Model sebagai Upaya Integratif Memerangi Sampah Plastik di Laut Indonesia. *Bina Hukum Lingkungan*, 5(2).

Ihsyaluddin, I. (2013). Kemampuan Mengelola Sumber Daya Pesisir Berdasarkan The New Environmental Paradigm (Studi Korelasional pada Masyarakat di Kabupaten Wakatobi Kecamatan Tomia)*). *Jurnal Green Growth Dan Manajemen Lingkungan*, 3(2). https://doi.org/10.21009/jgg.032.05

Iswari, R. D., & Utomo, S. W. (2017). Evaluasi Penerapan Program Adiwiyata Untuk Membentuk Perilaku Peduli Lingkungan di Kalangan Siswa (Kasus: SMA Negeri 9 Tangerang Selatan dan MA Negeri 1 Serpong). *Jurnal Ilmu Lingkungan*, 15(1). https://doi.org/10.14710/jil.15.1.35-41

Iwamoto, S. K., Alexander, M., Torres, M., Irwin, M. R., Christakis, N. A., & Nishi, A. (2020). Mindfulness Meditation Activates Altruism. *Scientific Reports*, 10(1). https://doi.org/10.1038/s41598-020-62652-1

Javanaud, K. (2020). The World on Fire: A Buddhist Response to the Environmental Crisis. *Religions*, 11(8). https://doi.org/10.3390/rel11080381

Kabat-Zinn, J. (2003). Mindfulness-based Interventions in Context: Past, Present, and Future. *Clinical*

Psychology: Science and Practice, 10(2). https://doi.org/10.1093/clipsy/bpg016
Kaiser, F. G. (1998). A General Measure of Ecological Behaviour. *Journal of Applied Social Psychology*, 28(5). https://doi.org/10.1111/j.1559-1816.1998.tb01712.x
Kang, C., & Whittingham, K. (2010). Mindfulness: A Dialogue between Buddhism and Clinical Psychology. *In Mindfulness*, 1(3). https://doi.org/10.1007/s12671-010-0018-1
Karuniastuti, N. (2013). Bahaya Plastik terhadap Kesehatan dan Lingkungan. *Swara Patra: Majalah Pusdiklat Migas*, 3(1).
Kyselá, E. (2015). Acceptability of Environmental Policies in the Czech Republic: A comparison with willingness to make economic sacrifices. *Socialni Studia/Social Studies*, 12(3). https://doi.org/10.5817/soc2015-3-179
Lim, H. L. (2019). Environmental Revolution in Contemporary Buddhism: The interbeing of individual and collective consciousness in ecology. *Religions*, 10(2). https://doi.org/10.3390/rel10020120
Meng, Y., Mao, K., & Li, C. (2020). Validation of a Short-Form Five Facet Mindfulness Questionnaire Instrument in China. *Frontiers in Psychology*, 10. https://doi.org/10.3389/fpsyg.2019.03031
Munawar, S., Heryanti, E., & Miarsyah, M. (2019). Hubungan Pengetahuan Lingkungan Hidup dengan Kesadaran Lingkungan pada Siswa Sekolah Adiwiyata. LENSA (Lentera Sains): *Jurnal Pendidikan IPA*, 9(1). https://doi.org/10.24929/lensa.v1i1.58
Nabi, R. L., & Prestin, A. (2017). Social Learning Theory and Social Cognitive Theory. *The International Encyclopedia of Media Effects*. https://doi.org/10.1002/9781118783764.wbieme0073
Nurwidodo, N., Amin, M., Ibrohim, I., & Sueb, S. (2020). The Role of Eco-school Program (Adiwiyata) towards Environmental Literacy of High School Students. *European Journal of Educational Research*, 9(3). https://doi.org/10.12973/EU-JER.9.3.1089
Nuzulia, S., Sukamto, S., & Purnomo, A. (2020). Implementasi Program Adiwiyata Mandiri dalam Menanamkan Karakter Peduli Lingkungan Siswa. SOSIO-DIDAKTIKA: *Social Science Education Journal*, 6(2). https://doi.org/10.15408/sd.v6i2.11334
Nyanaponika, T. (1962). *The Heart of Buddhist Meditation*. In San Francsico: Weiser.
Paramita, V. S., Indiyati, D., Ndaruhadi, P. Y. M. W., & Nuyman, A. (2017). Manajemen Sekolah Hijau Berwawasan Lingkungan. *Dharma Bhakti Ekuitas*, 2(1). https://doi.org/10.52250/p3m.v2i1.65
Pradini, I. K., Sudjanto, B., & Nurjannah, N. (2019). Implementasi Program Sekolah Adiwiyata dalam Peningkatan Mutu Pendidikan di SDN Tanah Tinggi 3 Kota Tangerang. *Jurnal Green Growth Dan Manajemen Lingkungan*, 7(2). https://doi.org/10.21009/jgg.072.03
Prihantoro, C. R. (2014). The Perspective of Curriculum in Indonesia on Environmental Education. *International Journal of Research Studies in Education*, 4(1). https://doi.org/10.5861/ijrse.2014.915
Rahmadiani, R., Utaya, S., & Bachri, S. (2019). Ecological Literacy Siswa SMA Adiwiyata dan Non Adiwiyata. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 4(4). https://doi.org/10.17977/jptpp.v4i4.12306
Ray, T. N., Franz, S. A., Jarrett, N. L., & Pickett, S. M. (2020). Nature Enhanced Meditation: Effects on Mindfulness, Connectedness to Nature, and Pro-Environmental Behavior. Environment and Behavior. https://doi.org/10.1177/0013916520952452
Razieh Tadayon Nabavi. (2016). *Bandura's Social Learning Theory & Social Cognitive Learning Theory Theories of Developmental Psychology*. Research Gate, January 2012.
Saari, U. A., Damberg, S., Frömbling, L., & Ringle, C. M. (2021). Sustainable Consumption Behaviour of Europeans: the Influence of Environmental Knowledge and Risk Perception on Environmental Concern and Behavioural Intention. *Ecological Economics*, 189. https://doi.org/10.1016/j.ecolecon.2021.107155
Saputro, A. (2021). Problematika Pengelolaan Sampah Daerah Khusus Ibukota Jakarta. *The Indonesian Journal of Public Administration (IJPA)*, 6(2). https://doi.org/10.52447/ijpa.v6i2.4387
Setyobudi, F., & Marsudi, S. (2018). Pendidikan Lingkungan Hidup di SMP Negeri 3 Kebumen Jawa Tengah. *JIPSINDO*, 5(1). https://doi.org/10.21831/jipsindo.v5i1.20180
Shadiqi, M. A., Heryati Anward, H., & Erlyani, N. (2016). Hubungan antara Kecerdasan Emosional dengan Perilaku Pro-Lingkungan serta Perbedaannya Berdasarkan Jenis Kelamin. *Jurnal Ecopsy*, 1(1). https://doi.org/10.20527/ecopsy.v1i1.478

Sudjoko et al., 2011. Pendidikan Lingkungam Hidup. *Universitas Terbuka*. ISBN: 978-979-011-269-8

Surya, J. (2019). Buddhist Approach to Harmonious Families, Healthcare, and Sustainable Societies. In T. N. Tu & Thich Duc Thien (Eds.), Buddhist Approach to Harmonious Families, Healthcare, and Sustainable Societies (pp. 413-). Hong Duc Publishing House.

Surya, J., Wibowo, M. E., & Mulawarman. (2021). Mindfulness-Based Cognitive Therapy (MBCT) Approach in Counseling Practice. *Proceedings of the 6th International Conference on Science, Education and Technology (ISET 2020)*, 574(Iset 2020), 463–466. https://doi.org/10.2991/assehr.k.211125.086

Sutikno, A, N. (2020). Bonus Demografi di Indonesia. VISIONER: *Jurnal Pemerintahan Daerah Di Indonesia*, 12(2). https://doi.org/10.54783/jv.v12i2.285

Taylor, N. Z., & Millear, P. M. R. (2016). Validity of the Five Facet Mindfulness Questionnaire in an Australian, Meditating, Demographically Diverse Sample. *Personality and Individual Differences*, 90. https://doi.org/10.1016/j.paid.2015.10.041

Umniyah, U., & Afiatin, T. (2009). Pengaruh Pelatihan Pemusatan Perhatian (Mindfulness) terhadap Peningkatan Empati Perawat. *Jurnal Intervensi Psikologi (JIP)*, 1(1). https://doi.org/10.20885/intervensipsikologi.vol1.iss1.art2

Wallmark, E., Safarzadeh, K., Daukantaitė, D., & Maddux, R. E. (2013). Promoting Altruism through Meditation: An 8-Week Randomized Controlled Pilot Study. *Mindfulness*, 4(3). https://doi.org/10.1007/s12671-012-0115-4

Wang, Y., Hao, F., & Liu, Y. (2021). Pro-environmental Behaviour in an Aging World: Evidence from 31 Countries. *International Journal of Environmental Research and Public Health*, 18(4). https://doi.org/10.3390/ijerph18041748

Wardani, D. N. (2020). Analisis Implementasi Program Adiwiyata dalam Membangun Karakter Peduli Lingkungan. *Southeast Asian Journal of Islamic Education Management*, 1(1). https://doi.org/10.21154/sajiem.v1i1.6

Wardani, Wiryono, & Susatya, A. (2020). Pengaruh Umur dan Gender terhadap Sikap Peduli Lingkungan pada Masyarakat di Kampung Nelayan Sejahtera Kelurahan Sumber Jaya Kota Bengkulu. *Naturalis*, 9(2).

Yu, C. Y., & Chiang, Y. C. (2018). Designing a Climate-Resilient Environmental Curriculum-A Transdisciplinary Challenge. *Sustainability (Switzerland)*, 10(1). https://doi.org/10.3390/su10010077

Yusliza, M. Y., Amirudin, A., Rahadi, R. A., Athirah, N. A. N. S., Ramayah, T., Muhammad, Z., Dal Mas, F., Massaro, M., Saputra, J., & Mokhlis, S. (2020). An Investigation of Pro-environmental Behaviour and Sustainable development in Malaysia. *Sustainability (Switzerland)*, 12(17). https://doi.org/10.3390/su12177083