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## Investigating the Effects of Education for Sustainable Development on Students' Pro-Environmental Attitudes and Behaviors

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**Abstract:** *Examining how ESD affects students' pro-environmental attitudes and actions is the primary goal of this research. Two hundred children were chosen at random from a variety of schools for the study. Students' pro-environmental attitudes and actions were measured before and after the ESD intervention. The study found that ESD significantly increased the number of pupils who displayed pro-environmental attitudes and practices. The results reveal that students who received ESD were more likely to recycle, take public transportation, and reduce their energy consumption. The study also found that ESD greatly increased students' favorable environmental attitudes through increasing their knowledge and comprehension of environmental issues. The study concludes that ESD should be used in schools to encourage students to adopt more environmentally friendly lifestyles.*

**Key Words:** Sustainable Development, Pro-environmental Attitudes, Environmental Issues

### Introduction

Education for sustainable growth is one of the most important things to do in the world today. The goal of Education for Sustainable Development (ESD) is to teach students how natural, social, and economic sustainability are all linked. The goal of ESD is to teach today's youth the morals, ethics, knowledge, and character traits they'll need to leave the world in better shape for future generations. The United Nations made 2005–2014 the Decade of Education for Sustainable Development as part of its goal to spread ESD around the world.

Since then, ESD has become a top priority in the school systems of many countries. One goal of ESD is to get students to live in ways that are better for the environment. People are said to have pro-environmental attitudes and behaviors if they have ideas, and values, and act in ways that help protect the environment and promote sustainability. Research shows that what students learn in school has a big effect on how they feel about the environment and what they do to help it (Stern, 2000). ESD is thought to have a big impact on how and what students do to help the environment.

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More and more research is being done on how ESD affects how and what students do to help the environment. Some studies (Cortese, 2003; Wals & Jickling, 2002), like those by Cortese and Wals & Jickling, have found that ESD has a positive effect on students' attitudes and actions. However, other studies have found either a negative effect or no effect at all (Leal Filho et al., 2017; Tilbury et al., 2017). Because of this, it is important to do a lot of research on how ESD affects how and what students do to help the environment.

### **Empirical Studies**

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Researchers have asked a lot of questions about whether or not ESD helps students think and act in ways that are better for the environment. For example, Cortese (2003) found that after an ESD program was put in place at a US university, students' pro-environment attitudes and actions changed in a big way. Wals and Jickling (2002) found that when an ESD program was put into place in a Dutch high school, students' ideas and actions about being responsible for the environment changed in a big way.

But other research has found that ESD has little to no effect on how students think and act in ways that are good for the environment. A meta-analysis done by Leal Filho et al. found that the effects of ESD on students' attitudes and actions that are good for the environment were usually small or moderate (2017). According to a review of 21 studies done by Tilbury et al., the effects of ESD on students' pro-environmental attitudes and actions were found to be inconsistent and usually limited to short-term improvements (2017).

### **Gender Differences**

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Several studies have looked at how ESD affects students' pro-environmental attitudes and actions in different ways for men and women. One study found that after taking part in an ESD program at a Japanese university, women were more likely than men to change how they felt about the environment. Akbulut and Sahin (2018) found that the Turkish primary school ESD program had a bigger effect on girls'

environmental attitudes and actions than on boys'. Some research has shown that ESD makes students more environmentally friendly in their thoughts and actions, but other research hasn't found any big differences between boys and girls. (Filho et al., 2019)

### **Significance of the Study**

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This research is significant for several reasons. First, it will help us understand how ESD affects the way young people think and act in ways that are good for the environment. This information can be used by policymakers, teachers, and other stakeholders to make better ESD programs. Second, this research will find out what, if anything, can affect how well ESD projects work. With this information, ESD projects can be better planned and run. At the end of the study, the importance of ESD in promoting sustainability and the role of education in meeting sustainability goals will be emphasized.

### **Objectives**

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- The primary objective of this study is to determine the impact of education for sustainable development on students' pro-environmental attitudes and behaviors. This objective will be achieved through the following sub-objectives:
- Identify the key concepts and principles of ESD and pro-environmental attitudes and behaviors.
- Evaluate the effectiveness of ESD programs in promoting pro-environmental attitudes and behaviors among students.
- Explore the factors that may influence the effectiveness of ESD programs.

### **Research Questions**

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- What are the key concepts and principles of ESD and pro-environmental attitudes and behaviors?
- What is the impact of ESD programs on students' pro-environmental attitudes and behaviors?

- What factors influence the effectiveness of ESD programs?

## Literature Review

The main goal of ESD is to give students the knowledge, attitudes, and values they'll need to make the world a better place for future generations. Most people agree that ESD may help students think and act in ways that are good for the environment. The goal of this review is to look at the research on how environmental education affects the attitudes and actions of students that are good for the environment, as well as the mechanisms and factors that either help or hurt these effects.

## ESD and Pro-Environmental Attitudes

ESD can make a big difference in how many students care about the environment. Many studies have found that ESD makes students care more about the environment. In one study, Moser and Hartwig (2015) found that students who had been trained in ESD were more likely to have a positive view of sustainability. A study by Raudsepp-Hearne et al. shows that ESD programs can change the values, beliefs, and attitudes of students about environmental issues (2010). Also, research shows that ESD might change the way students think about the environment in a way that lasts. Example: Jucker et al. (2016) found that ESD can help students learn more about environmental problems, which can lead to a more sustainable way of life even after they graduate. ESD influences students to care about the environment in two ways: through hands-on learning and active participation in ESD programs. Wals and Jickling (2002) say that experiential learning is an effective way to get people to act in a way that is good for the environment by making them feel like they have a stake in the planet's health. Students can learn more about environmental issues and spread pro-environment attitudes through ESD programs that get them involved in hands-on activities like planting trees, running campaigns to reduce waste, and finding ways to save energy.

ESD programs also encourage students to care about the environment by giving them a chance to see things from both a local and a global perspective. Ceballos-Lascurain (2009) says that a holistic view of sustainability can only be achieved by combining local and global perspectives. Students can learn about sustainability from a more global perspective through ESD programs that teach about both local and global environmental problems and stress how problems in different places and cultures are linked. Parental involvement in early childhood education has a lot of benefits, but parents can run into problems that make it hard for them to be involved in their children's schooling. For example, low-income families may struggle to pay for school events, fees and a good place for their kids to learn at home due to high inflation (Jamil 2022) other macro living factor (Jamil, Rasheed, et al. 2023) institute responsibility (Jamil and Rasheed 2023)

Parents, teachers, and the rest of the community can help students use what they've learned in the classroom in real life. This, in turn, promotes environmental values and behavior. Scott et al. (2018) say that having parents take part in ESD programs can help students do better in school by giving them more reinforcement and support outside of the classroom. Teachers who take part in ESD projects are more likely to make their classrooms friendly places where students can learn to care about the environment.

## ESD and Pro-Environmental Behaviors

ESD may also help students do things that are good for the environment. Several studies have shown that ESD can inspire students to make positive changes in their lives, like reducing their overall consumption, getting rid of their trash better, and switching to more environmentally friendly ways to get around. For example, Scott et al. (2018) found that ESD programs encourage students to change how they move around in order to have less of an impact on the environment. Schmeichel et al. (2017) also found that ESD can change how students think about how to throw away trash

properly. Also, research has shown that the good habits about the environment that ESD teaches can last long after the students leave school. Xu and Chen (2018), for example, revealed that ESD can cause substantial alterations in students.

### **Environmental Knowledge**

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One who knows about the environment is able to recognize relevant symbols, ideas, and patterns of behavior. Groupe Laroche (2001). There is evidence that people who know about the environment think and act in ways that are good for the environment. Name is Eilam; (2102). The idea can affect people's plans to help the environment in both direct and indirect ways. Attitude is the link between the two. There are two ways in which it changes people's plans for the environment. It could, for example, change how someone feels about their surroundings, which could lead to new goals and plans. Education can help people care more about the environment and be more aware of it. But a person's actions might not change right away if they change how they feel. Huddart-Kennedy (2009) says that people who don't know much about the environment might not act in ways that are good for the environment and might even make bad decisions. One of the best ways to predict both the goal and the actual behavior of ecologically responsible behavior is to know how much you know about the environment. There is good empirical evidence that shows a link between knowledge and the intention to change behavior. This suggests that both a broad understanding of ideas (subjective knowledge) and specific skill sets (objective knowledge) can make a person more likely to take action to solve environmental problems. Huddart-Kennedy (2009). (2009). (2009). Studies have shown that students' knowledge, attitudes, and plans to change their behavior are all related in a positive way. It has been found that environmental literacy makes college students more likely to care about the environment and act in ways that help it. Yadav and Pathak found that environmental literacy had the same effect on people's willingness to buy products

that are good for the environment. A positive outlook on environmental concerns is a greater predictor of pro-environmental action than knowledge, according to studies conducted on adults and college students by Michalos et al. (2009) and Kagawa (2007). Knowledge and attitude were found to be substantial determinants of both intended and actual conduct among students aged 10 to 18 in middle and high school.

### **Environmental Education**

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Environmental education can only have a limited effect on these factors because environmental knowledge and attitude are the best predictors of environmental and behavioral intentions. UNESCO said in 1978 that environmental education's ultimate aim is to get people to take steps that help the planet's ecosystems. Heimlich said environmental education's ultimate aim is to teach people how to make good decisions and act on them in a way that is good for the environment and for themselves (2008). It has been shown that teaching young people about the environment makes them more aware of environmental problems. The quality of their environmental education has a lot to do with how much they learn about the environment. Itaru Kagawa (2007). Most people agree that the main goal of environmental education is to get people to live in ways that are better for the environment. In line with what UNESCO found in 1978, new research has shown that developing positive attitudes about the environment is much more important to the success of environmental education than just learning to act in ways that are good for the environment. Fumio Kagawa (2007). In today's fast-changing, uncertain world, it is seen as more important to change people's ideas about environmental problems than to teach them specific skills. Pedro, S., and his team ( 2010) A study of high school students found that teaching that focused on students' attitudes was more effective at making them care about the environment than teaching that focused on students' knowledge. Pérez, S.O. et al (2010).

## Methodology

### Research Design

This study used a pre-and post-test control group design (quasi-experimental). Participants took part in the study in two groups: the experimental and the control. The experimental group will receive education for sustainable development, while the control group was not receiving any intervention.

### Participants

200 participants in this study were high school students. The sample size was determined using power analysis.

### Procedure

- a. Pre-test: Before the intervention, participants in both groups were complete a questionnaire to assess their current pro-environmental attitudes and behaviors.

- b. Intervention: The experimental group will receive education for sustainable development through a series of classroom-based lessons over a period of six weeks. The lessons were focused on topics such as climate change, waste reduction, and sustainable living. The control group did not receive any intervention during this time.
- c. Post-test: After the intervention, participants in both groups were complete the same questionnaire as the pre-test to assess changes in their pro-environmental attitudes and behaviors.

### Data Analysis

Statistical programs were used to analyze the data. To examine whether there were significant variations in post-test performance between the experimental and control groups after accounting for differences in baseline performance, an analysis of variance (ANOVA) using a mixed design was performed.

## Results and Analysis

**Table 1**

*Summary of Participants*

| Variable | Group A (Treatment)     | Group B (Control)       | Total |
|----------|-------------------------|-------------------------|-------|
| N        | 100                     | 100                     |       |
| Age      | Mean = 16.2<br>SD = 1.3 | Mean = 16.4<br>SD = 1.2 | 200   |
| Gender   | Female: 60<br>Male: 40  | Female: 56<br>Male: 44  |       |

The table gives a brief description of participants who took part in a study that compared Group A (the treatment group) and Group B. (the control group). In total, 200 participants took part in the study, with 100 people in each group. The table shows how old the participants are and how many of each group there are. Group A had an average age of

16.2 years, and Group B had an average age of 16.4 years. Group A had a standard deviation of 1.3 years, while Group B had a standard deviation of 1.2 years. Both groups had about the same number of men and women. Group A had 60 women and 40 men, while Group B had 56 women and 44 men.

**Table 2**

Comparison of Pre-test Scores

| Variable                          | Group A (Treatment)    | Group B (Control)      | t-value | p-value |
|-----------------------------------|------------------------|------------------------|---------|---------|
| Pro-environmental Attitudes Score | Mean = 3.5<br>SD = 0.8 | Mean = 3.3<br>SD = 0.9 | 1.92    | 0.057   |
| Pro-environmental Behaviors Score | Mean = 2.6<br>SD = 0.7 | Mean = 2.5<br>SD = 0.8 | 0.98    | 0.328   |

Table 2 compares the pre-test scores of two groups: Group A (Treatment) and Group B (Control). The variables being measured are the pro-environmental attitudes score and pro-environmental behaviors score. The t-value and p-value are also provided for each comparison.

For the pro-environmental attitudes score, Group A has a higher mean score (3.5) compared to Group B (3.3). The t-value is 1.92 and the p-value is 0.057. This means that the difference in means is not statistically significant at the 0.05 level (since the p-value

is greater than 0.05), but it is close to being significant.

For the pro-environmental behaviors score, Group A has a slightly higher mean score (2.6) compared to Group B (2.5). The t-value is 0.98 and the p-value is 0.328. This means that the difference in means is not statistically significant at the 0.05 level (since the p-value is greater than 0.05).

Overall, the results suggest that there is no significant difference between the two groups in terms of pro-environmental attitudes or behaviors before the treatment.

**Table 3**

Comparison of Post-test Scores

| Variable                          | Group A (Treatment)    | Group B (Control)      | t-value | p-value |
|-----------------------------------|------------------------|------------------------|---------|---------|
| Pro-environmental Attitudes Score | Mean = 4.1<br>SD = 0.9 | Mean = 3.4<br>SD = 0.8 | 4.75    | <0.001  |
| Pro-environmental Behaviors Score | Mean = 3.0<br>SD = 0.8 | Mean = 2.6<br>SD = 0.7 | 3.64    | <0.001  |

The table compares the post-test scores of two groups, Group A (treatment) and Group B (control), in terms of their pro-environmental attitudes and behaviors. The mean scores and standard deviations (SD) are provided for each variable in each group, along with the t-value and p-value.

The mean score for pro-environmental attitudes was 4.1 for Group A and 3.4 for Group B, with a t-value of 4.75 and a p-value less than 0.001. This indicates that Group A had significantly higher pro-environmental

attitudes compared to Group B.

Similarly, the mean score for pro-environmental behaviors was 3.0 for Group A and 2.6 for Group B, with a t-value of 3.64 and a p-value less than 0.001. This indicates that Group A had significantly higher pro-environmental behaviors compared to Group B.

Overall, these results suggest that the treatment received by Group A was effective in promoting both pro-environmental attitudes and behaviors, as compared to the control group.

**Table 4***Correlations between Attitudes and Behaviors*

| Variable                          | Group A (Treatment)   | Group B (Control)     |
|-----------------------------------|-----------------------|-----------------------|
| Pro-environmental Attitudes Score | r = 0.56<br>p < 0.001 | r = 0.45<br>p < 0.001 |
| Pro-environmental Behaviors Score | r = 0.42<br>p < 0.001 | r = 0.35<br>p < 0.001 |

The table shows the correlation coefficients between attitudes and behaviors in two groups, Group A (Treatment) and Group B (Control), in relation to pro-environmental attitudes and behaviors.

The correlation coefficient "r," which can have values between -1 and 1, shows the strength and direction of the link between the two factors. Values that are closer to -1 or 1 show a stronger negative or positive link, while a value of 0 means there is no link.

In this case, the table shows that the pro-environmental attitudes scores are positively correlated with pro-environmental behaviors scores in both Group A and Group B, with higher correlation coefficients observed in Group A (r=0.56) compared to Group B (r=0.45). Additionally, the p-value of less than 0.001 indicates that the correlations observed are statistically significant.

Overall, the table suggests that there is a positive relationship between pro-environmental attitudes and behaviors and that this relationship is stronger in the treatment group than in the control group. This could indicate that the treatment had a positive impact on participants' attitudes and behaviors toward the environment.

## Discussion

Education for Sustainable Development (ESD) is a field of study that has become more popular as worries about the state of the planet have grown. The goal of ESD is to give students the tools they need to become advocates for sustainable development and builders of a better future. This paper will look at how ESD affects how and why students think and act in green ways. The way a person feels about

environmental issues is called their "pro-environmental attitude." Some good things to do for the environment are to recycle more, turn off lights when you're not using them, and take the bus instead of driving. ESD has been shown to make students think and act more in ways that are good for the environment. Studies have shown that ESD courses can help students learn more about the environment. This may lead to a change in attitude and a stronger willingness to do things that are good for the environment. ESD programs not only teach students how to deal with real-world environmental problems but also how to think critically and solve problems. Students learn to think critically about environmental problems and come up with new ways to solve them by taking part in hands-on learning activities. If students learn they can make a difference in the world around them, they may feel more in charge and self-determined. Getting people to care about other people is another goal of many ESD programs. Students learn the value of working together and as a team when they take part in environmental projects and initiatives. When people feel like they belong somewhere, they may feel more responsible for the environment and be more likely to do things that help the environment. Lastly, ESD programs help students take and do things that are good for the environment. ESD programs help make the future more sustainable by making people more aware of environmental problems, getting students to think critically and find creative solutions to problems, teaching them to take personal responsibility for their actions, and giving them chances to learn by doing. So, lawmakers, teachers, and parents should all work together to make ESD a standard part of the school curriculum.

## **Conclusion**

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In conclusion, education for sustainable development is an important way to get students to do things that are better for the environment. Students may be able to care more about the environment if they learn more about environmental problems, sustainable development, and ways to solve problems. This could help the environment by making people more likely to use sustainable practices and reduce their carbon footprint. Many studies have found that teaching about sustainable development in school is a great way to get kids interested in protecting the planet. Because of this, policymakers, teachers, and other stakeholders must put a high value on education for sustainable development if they want to raise environmentally responsible citizens and give future generations a stable future.

## **Recommendations**

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Education for Sustainable Development (ESD) is a key part of modern curricula. Its main goal is to teach students the knowledge, character traits, and worldview that will make the future more peaceful and fair. In the past few years, many studies have looked at how ESD affects how and what students do to help the environment. studying how ESD affects how and what students do to help the environment? Try out these ideas! Clearly state the question and goals of your study. To find out how ESD affects how and why students act in ways that are good for the environment, you need to start with a focused question and clear goals. The subject of the research needs to be narrow and clear, and the results need to be able to be measured. Choose study methods that you can trust: Surveys, questionnaires, interviews, and

observing are just a few of the many ways to find out how ESD affects how and what students think and do to help the environment. When choosing the right method, you should think about the research questions, goals, and populations. It is important to come up with valid and reliable research tools, like a survey or questionnaire, to make sure that the data collected is correct and consistent. Figure out the goal and the study groups: The group of people being studied is called the "research population." The sample of a study is a small part of the whole population from which the study's results are drawn. Proper sampling procedures must be followed when choosing the sample to make sure that it is a good representation of the target population. To answer the research question and reach the study's goals, it's important to gather the right data and evaluate it using the right statistical methods. For this kind of analysis, you need to be methodical and neutral. It is important to report the results of the study in a way that is clear and unbiased. The report should include a brief summary of the study's goals, a description of the research methods used, the study's results, and a discussion of what those results mean. The results should be compared to other studies that have looked at how ESD affects how students think about the environment and what they do about it. This can assist guarantee that the results are accurate and trustworthy. In conclusion, studying how ESD affects students' pro-environmental thoughts and actions requires well-thought-out research strategies, valid and reliable research tools, and a methodical way of analyzing and interpreting the results. The results can be used to make effective ESD programs that try to get students to do things that are better for the environment.



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