

## CAN WE TACKLE THE ENVIRONMENTAL CRISIS WITH EDUCATION?

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### YOUNG REVIEWERS:



ANNIKA

AGE: 13

The world is becoming less livable due to climate change and the loss of nature. What can be done to stop this environmental crisis? What would empower young people to help protect the environment? Schools and clubs sometimes offer environmental education programs—lessons or activities to help young people understand the environment and its vulnerabilities, and what can be done to protect it. Do these environmental education programs work? To answer this question, we conducted a big summary of 169 studies, which included more than 176,000 young people from around the world. The results provide good news: environmental education generally helps young people to know about, care about, and do things to protect the environment. Our research also raises new questions. For example, now that you know environmental education can be effective, do you think it should be provided

more often? Should environmental education be a required subject in school?

## IT IS NOT TOO LATE TO STOP THE ENVIRONMENTAL CRISIS

We are writing this article in the summer of 2024, and it is warm. In fact, on 22 July 2024, Earth experienced its warmest day since 1940. Earth's average air temperature is increasing, a process that scientists call **climate change**. Climate change is a problem for many reasons. For example, it makes extreme weather events—droughts, storms, and floods—more common. Extreme weather events make it more difficult for people to **grow food and find safe places to live**. The world is also becoming less livable due to the large-scale destruction of nature, for example due to plastic pollution. Scientists say that we are living through an **environmental crisis**, because the quality of Earth's environment is quickly getting worse.

These are “hard” scientific facts, which means they can be measured. For example, based on a long history of temperature records from around the world, researchers are sure that the world is heating up. But the facts are also “hard” because they expose a painful reality: the environmental crisis is caused by humans [1]. We are using fossil fuels (such as oil and gas) so intensively that **the world is warming**. And we are taking up so much space (by cutting down forests, for example) that we endanger the natural environments where other species live. For too long, we have failed to care for the planet as well as we should.

It is not yet too late to turn things around [2]. There is still time to limit the environmental crisis. To do so, we must change the way we live our lives, and we need to do so as soon as possible. If we take the hard facts about the environmental crisis seriously, we can build a healthier planet together.

## ENVIRONMENTAL EDUCATION

What do you think would help you and your friends change your lives and contribute to a healthier planet? This is, of course, a difficult question. There is no magic trick that instantly makes us change the way we live our lives. How can we make sure that more young people learn about the strengths and vulnerabilities of our environment? How can we empower young people to help protect the Earth?

Education might help. For decades, experts have developed **environmental education programs**, with the goal of helping people understand the natural environment and what we can do to protect it [3]. The idea behind these programs is that young people are more

### CLIMATE CHANGE

Change in the average global air temperature. Over the past decades, the average global air temperature has increased. We call that global warming.

### ENVIRONMENTAL CRISIS

The rapid and dangerous worsening of the environment that we live in. Two main causes are climate change and the large-scale destruction of nature.

### ENVIRONMENTAL EDUCATION PROGRAMS

Lessons and other activities to help people understand the natural environment and its vulnerabilities, and what can be done to protect it.

likely to protect the environment when they understand that we are facing an environmental crisis—a crisis we can still do something about if we take action together. In some environmental education programs, students receive lessons or complete assignments at school. In other programs, students go out and learn by doing things (Figure 1). For example, they may investigate the quality of the environment close to where they live or join an outdoor camp to learn more about nature.

### Figure 1

Young people participating in environmental education programs. In some programs, students receive lessons at school. In other programs, students visit natural spots to learn about the environment.



Figure 1

Many environmental education programs are developed for young people like you. Of course, your generation did not cause the environmental crisis. Still, it is important to teach the younger generations so that they know how to do things better than their parents' and grandparents' generations. Also, you have more power to make a difference than you might think. Why? You have a long future ahead of you. This means that how you choose to live now will make a big difference over the course of your life. What will your future diet look like? How will you travel around the world? Your lifestyle choices can even inspire older generations: young people who engage in behaviors to protect the environment often motivate their parents to do so, too [4].

## WHAT DID WE TEST AND HOW DID WE DO IT?

The existence of environmental education programs seems like a very good thing. But do they really work? Do they help young people understand the environment and the effects of climate change? Do they motivate young people to do things to protect the environment? Researchers all over the world have investigated these questions. This research has produced so many different findings that it is hard to draw firm conclusions. What is missing is a big research summary that analyzes the results from all these studies. To do so, we used a method called **meta-analysis**. Meta-analysis is a way to combine and summarize the results of many similar studies into one big answer.

### META-ANALYSIS

A research method to combine and summarize the results from many similar studies. Meta-analysis allows researchers to draw conclusions from a whole field of research, rather than from one study.



We set out by searching large online databases of scientific studies. After careful screening, we found 169 relevant studies testing the effects of environmental education on young people. We noticed some interesting things. For example, research on environmental education is truly global: the studies we found were conducted in 43 countries, across 6 continents. We also found that the field of research on environmental education is quite old—the earliest study was published in 1971, probably before your parents were born! Finally, we were amazed by how *many* young people have taken part in research on environmental education—more than 176,000 kids participated in the studies we found, and they ranged in age from 3 to 19. This group of research participants is so big that they could easily fill two of the largest football stadiums in the world.

## WHAT DID WE LEARN?

So, do environmental education programs work? The short answer is yes (Figure 2). Our meta-analysis showed that environmental education programs have an especially big impact on *knowledge*: young people who take part in environmental education learn a lot about nature, the climate, and what they can do to protect the environment. But that was not all. We also found that environmental education has somewhat smaller, but still meaningful, effects on *attitudes* and *intentions*: it makes young people feel positive about the environment and motivated to protect it. Finally, we found that environmental education encourages environmental *behavior*—young people who have taken part in environmental education are more likely to do things to protect the environment, such as recycling waste, taking shorter showers to save water, carrying a reusable water bottle, or turning off the lights when leaving a room.

### Figure 2

Using meta-analysis, we summarized the results of 169 studies that tested how well environmental education works. We found that environmental education programs have a big impact on knowledge: young people learn a lot about nature, the climate, and what they can do to protect the environment. We also found that environmental education has somewhat smaller, but still meaningful, impacts on attitudes, intentions, and behavior—it helps young people to care for and protect the environment.

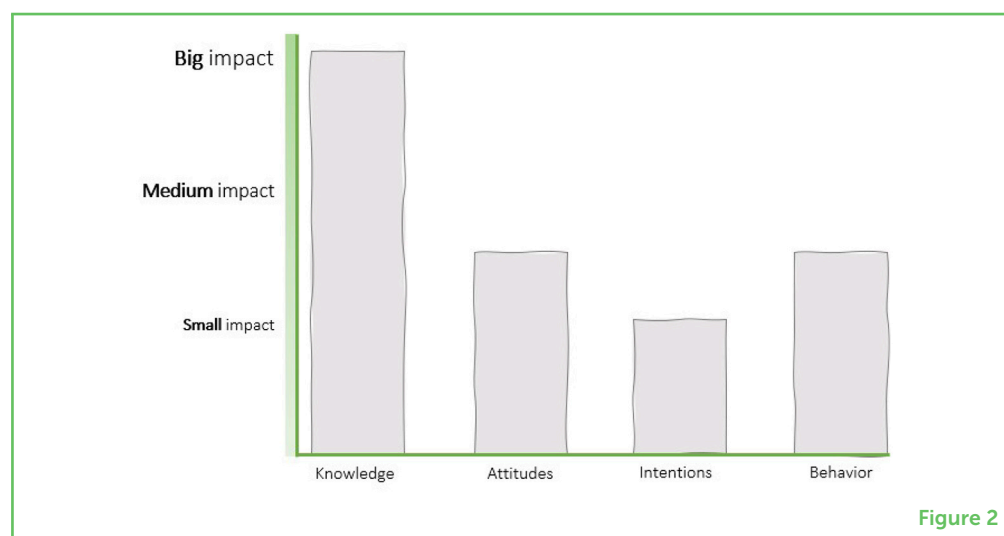


Figure 2

Note, however, that measuring behavior in research can be quite difficult. In many of the studies we found, researchers used questionnaires to ask students to report on their own behaviors. Such self-reports can be informative, but they are also tricky. People sometimes misremember their behaviors, or they may not be entirely honest. Thankfully, we also found evidence from studies in which researchers directly observed young people's behavior. For example, in one study, students who had learned about waste recycling were given wrapped sweets. The researchers then observed if the students recycled the wrappers in the correct bin [5]. Very clever!

Overall, we found that the benefits of environmental education programs can be very broad. They help young people know about, care about, and do things to protect the environment. We found these benefits across different types of environmental education programs. Regardless of whether programs involved learning in class, doing some activity in nature, or going to a camp (or some combination of these things), their effectiveness was similar.

## WHAT DO WE NOT YET KNOW?

There are two important things to remember from the field of environmental education research and from our study, specifically. First, we can still limit the environmental crisis. If we manage to improve the ways in which we live our lives, we can create a healthier planet. Second, environmental education can be a powerful way to prepare young people for the future. We found that environmental education does not only help young people understand what environmental problems we face—it also encourages them to act.

This is good news. Still, some important questions remain. For example, our analysis did not show what the best way is for teachers to teach environmental education. We hope that, in the future, scientists will examine which activities (for example, learning in class or going to a camp) work best for children of different age groups. There are also questions that experts find hard to answer, but that you may have ideas about—questions that you could discuss with your friends and classmates. Do you think all young people around the world should receive environmental education? Do you think environmental education should be offered in all schools? There is no right answer—the most important thing is to learn from each other's perspectives.

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## YOUNG REVIEWERS



### ANNIKA, AGE: 13

My name is Annika, I am 13 years old and live in Germany. I enjoy playing ice hockey, tennis, soccer, and cello. I am also a member of our school orchestra. In my free time I love to meet up with friends. At school my favorite subjects are sports and English.

## AUTHORS



### JUDITH VAN DE WETERING

Judith van de Wetering is interested in how young people are affected by and can contribute to societal issues, including climate change. She is a Ph.D. candidate in developmental psychology at Utrecht University (the Netherlands). In her research, she examines how communication about climate change can help young people to contribute to a healthy planet. \*[j.vandewetering@uu.nl](mailto:j.vandewetering@uu.nl)



### PATTY LEIJTEN

Patty Leijten studies how well programs designed to improve the lives of young people actually work. This is important because offering a program with good intentions does not mean that the program will work. She works as an associate professor of child development at the University of Amsterdam (the Netherlands) and hopes that her research will be used to offer youth the best possible programs to improve their lives and the world they live in.



### JENNA SPITZER

Jenna Spitzer is interested in how young people understand themselves, the world around them, and what they can do to pursue a good life. She is a Ph.D. candidate in developmental psychology at Utrecht University (the Netherlands). In her current research, she examines what motivates young people to engage in behaviors that help protect the environment and contribute to the creation of more sustainable societies.



### SANDER THOMAES

Sander Thomaes is a professor of psychology at Utrecht University (the Netherlands). From a young age, he has been fascinated by human behavior and how it is rooted in our thinking and feeling. With his research, he wants to learn why it can be so hard for young people (actually for everyone) to change the way they behave. Sander is especially interested in environmental, or “green” behaviors. He says: “Many young people are concerned about environmental problems. I want to know how we can empower them to act on their concerns and help create a healthier planet”.