



# How Could I Not Have Known About the Climate Crisis?

## *Developing a Cross-Curricular Climate Change Education Program*

Jennifer A. Rudd, Swansea University, Swansea, Wales, UK

### **Abstract**

In this article, I reflect on the impact of learning about the climate crisis and how doing so inspired me to develop a climate change education program. The article contains details on the new program, entitled *You and CO<sub>2</sub>*, how it has been adapted to be suitable for a range of learners and how a new curriculum aided delivery of *You and CO<sub>2</sub>* across Wales. I share changes made in both my personal and professional life and how learning about the climate crisis ultimately led to me changing my career.

### **Keywords**

Digital fiction, imagination, carbon footprint, cross-curricular, digital literacy, climate education

## Background

In 2018, for the first time, I was shown the projections for the planet for two degrees and four degrees of global warming. I couldn't believe that nobody had told me this before. I was an academic researcher with both a master's degree and a PhD in chemistry, frequently working on next generation solar panels and hydrogen fuels. But all that time I thought I was working to make sure we had alternative power for when fossil fuels ran out. I didn't know that actually we'd already burnt so much fossil fuel that we had warmed our planet by over one degree Celsius and that the global population was already experiencing the dramatic effects of climate change.

What could I do with this knowledge? I started by cutting my family's carbon footprint. We gave up flying, adopted a vegetarian diet, installed environmentally friendly heating sources in our house and purchased solar panels. But it didn't seem like enough. I started asking how it was that, despite my significant level of education, nobody had told me about the climate crisis. Then I asked an even bigger question: 'Was it possible to teach climate change in a way that effected behavioural change?'

## Answering the Question

To answer this question, I teamed up with colleagues also in academia and wanting to respond to the climate crisis in some way. As experts in creative writing, psychology, pedagogy and chemistry, we came together to devise a way of teaching climate change and then measuring the resulting behavioural change. We developed a program called You and CO<sub>2</sub>, which combines chemistry, math, digital literacy, computer coding, English literature and creative writing in three workshops ([www.youandco2.org](http://www.youandco2.org)). We have analysed the program both qualitatively and quantitatively and, so far, are able to evaluate students' attitudes towards climate action. Developing an instrument to measure subsequent behavioural change is an ongoing piece of work.

To develop the program, we drew inspiration from a number of different sources. The first was the new [Curriculum for Wales](#), which was being piloted in a number of schools. Rather than taking a siloed approach to subjects the new curriculum encouraged and promoted a transdisciplinary, cross-curricular, approach to

learning. This enabled us to design a program with several different subjects incorporated.

The new curriculum, rolled out in 2022, mandated teaching sustainability, aiming for students to become “ethical, informed citizens of Wales who understand the impact of their actions on Wales and the wider World” (Welsh Government, 2025). This meant that we could develop a program that teachers would want to use, as they would need suitable resources to help deliver the new curriculum.

We also took inspiration from our research backgrounds. As a chemist with significant experience doing scientific outreach, I adapted resources from previous outreach activities to make an engaging first workshop about carbon footprints. Another member of the team was an expert in digital fiction and used that to develop the second and third workshops.

### **The You and CO<sub>2</sub> Climate Change Education Program**

The program has been trialed with students aged twelve to fifteen and can be completed within a day, as an off-timetable activity. Alternatively, it can be spread over two weeks during a specific set of lessons. All of the resources are available from [www.youandco2.org/teachers-pack](http://www.youandco2.org/teachers-pack)

#### ***Workshop 1: Math and Chemistry, 1 hour***

In the first workshop, students use chemistry and mathematics to think about their personal carbon footprint. How did they get to school? What did they eat for breakfast? Using a reference document we developed, students calculate their individual carbon footprint and then combine those in groups of four to six students. Then, they discuss how to hypothetically reduce that carbon footprint by a third. This causes students to negotiate with each other; maybe one can carpool instead of riding solo? Maybe one can change the dairy milk on their breakfast to a soy alternative? Students start to think about structural issues around their carbon footprints and how that affects their decisions as well—for instance, maybe there is no bus route near them, so they’re forced to come to school in a car.

### ***Workshop 2: English literature and digital literacy, 1-2 hours***

In the second workshop, students read a custom-built digital fiction called 'No World 4 Tomorrow' ([www.youandco2.org/NW4T](http://www.youandco2.org/NW4T)). This is a multi-ending story, and it responds to decisions that students make. Students can personalise the story by inputting their main character and three supporting characters' names and pronouns. As students work through the story they are faced with small choices, such as how to eat and how to get around, as well as bigger choices, such as what to do when their society is threatened. In this workshop students think about the climate crisis at a societal level and move on from thinking about individual decisions.

### ***Workshop 3: Creative writing and computer coding, 2 hours***

In the third workshop students write their own digital fiction. They learn some basic coding and use a platform called 'Twine' ([www.twinery.org](http://www.twinery.org)) to develop their stories. As long as the story in some way relates to the climate crisis, and has decision points, they are free to write about whatever topic they like. Students have written about hedgehogs, the impact of make-up, fast fashion and many other things. You can see examples on our website <https://youandco2.org/play-student-games/>.

### **Reflections on the You and CO<sub>2</sub> Program**

The positive: The You and CO<sub>2</sub> program has now been downloaded in 14 countries in three continents over the last three years. Classroom teachers and education academic experts have praised it "inspiring", "brilliant", "not something I could have come up with on my own". The program has inspired curriculum development in schools in South Wales, particularly supporting incorporation of more climate change content in arts and humanities curricula.

The negative: Students from lower socio-economic backgrounds found the first workshop hard because they didn't have the financial provision to make autonomous decisions about what they ate or how they travelled. They didn't want this to be exposed to their classmates and, therefore, disengaged. To solve this, we created characters that students could use to complete the workshop one activity, without having to rely on their personal situation. This helped students feel less exposed. Feedback from another school was that the vocabulary in the No World 4 Tomorrow

digital fiction was too complex. We provided an audio to pronounce the words and gave alternative wording when the tricky word was clicked on.

We also created a rubric for the students, for workshops two and three, so that they would know what was expected of them in terms of scientific content, spelling, punctuation, grammar, and the number of decision points etc.

### **Personal Reflections on Engaging with Climate Change Education**

In 2018 I didn't know that my life was about to be changed. Knowing the truth about the climate crisis I couldn't continue as a chemist. Working on You and CO<sub>2</sub>, with my interdisciplinary colleagues, showed me that the skills I had gained in research and in the labs were transferrable to other areas. I slowly made the switch from the "hard" sciences to social sciences. Changing disciplines has not been easy, thrust into a world of pedagogy literature and having to Google every second word I read! However, it has been rewarding to experience attitudes and behaviours changing as a result of my work. I have also had the privilege of supporting other climate change curriculum development both in schools (e.g. elementary school resources for teaching about fast fashion [www.tinyurl.com/ClothesCycle](http://www.tinyurl.com/ClothesCycle)) and with third sector organisations. I even contributed to policy advice for the Welsh Government (<https://netzero2035.wales/our-reports/what-could-education-skills-and-work-look-like-across-wales-by-2035/>)

I still fear for our collective future, but I try to focus on my sphere of influence. I find that by orienting my work at climate crisis solutions I am able to keep my climate anxiety under control and really make a difference in my country.

### At a Glance

<b>Title</b>	You and CO <sub>2</sub>
<b>Unit Time</b>	5-7 hours + 1 homework activity
<b>Grade Level(s)</b>	7-9
<b>Core Text</b>	No World 4 Tomorrow, available <a href="http://www.youandco2.org/NW4T">www.youandco2.org/NW4T</a>
<b>Supporting Texts</b>	None
<b>Climate Literacy Terms</b>	Carbon footprint, societal action
<b>Objectives</b>	<ul style="list-style-type: none"><li>• Understand where carbon dioxide comes from</li><li>• Consider individual and societal actions that can be taken to tackle climate change</li><li>• Create digital narratives with multiple storylines to explore climate action for themselves</li></ul>
<b>Materials and Resources</b>	All available at <a href="http://www.youandco2.org/teachers-pack">www.youandco2.org/teachers-pack</a>

### References

Welsh Government (2025) Curriculum for Wales. Available at  
<https://hwb.gov.wales/curriculum-for-wales>