

## Commentary

# Getting to Net **Zero**: Why Education and Analytical Skills are Key to Reaching Europe's Goals



BY **SIR PETER GLUCKMAN**

The European Commission has called for a “climate change competency framework” as part of the [European Green Deal](#). What are policymakers trying to achieve through consideration of the role of education in the climate change framework?

I can see at least four key reasons for developing this line of thinking, and those reasons, in turn, should inform how a competency strategy might be developed. Concretely, a climate-action competency framework would help to

- Gain societal consensus regarding difficult trade-offs and decisions that will need to be made in coming years that impact on everyone's way of life;
- Empower the behavioural change which will be required;

- Sustain, enhance or regain societal cohesion in the face of the growing existential risks created by climate change – as well as the parallel pressures created by associated changes, many of which will be exaggerated by climate. These include geostrategic, social, technological, economic, and demographic change. They will interact together with climate change to impact people's wellbeing in complex ways. Political action over climate change will not occur in isolation from these dynamics, and this in turn could add to mindsets of confusion, blame, anxiety, anger and loss of trust that rapid and threatening change often brings;
- Protect citizens' psychological resilience and mental health in the face of challenges ahead arising both from the externalities of rapid change and from societal decisions that need to be made.

The challenge arises in an environment where technologies have empowered misinformation and disinformation, especially around climate change and where the future of technology may both enhance risk and yet at the same time be core to solutions.

Many paradoxes abound. We talk about the global commons, yet the multinational system is collapsing. Inequality grows, environmental degradation continues unabated and trust in governments is generally under threat. We are asking for a lot of education to change all that. Until governments take action and behave in ways that regain trust from their citizens and promote social cohesion, expecting too much of education may be unrealistic. In the end, no matter how much citizens understand, big decisions are needed and governments must have the trust of citizens to make them.

But that diversion aside, let us focus on both formal and informal education and what they can do to advance climate change action.

First, let us deal with the easiest aspect – defining what not to do. For starters, we must not treat this as primarily an issue of inadequate science education and take a deficit approach. Indeed, I am worried that the terminology of a “common competency framework” is itself framing the problem as a deficit issue. That is not to say that science education and at least science literacy are not critical, but I shall return to that point in a moment.

I think there are more fundamental needs to focus on first in both formal and informal education. Executive function, literacy and critical thinking are the three most important skills we need to focus education on, and all are critical to this challenge. Executive function is the brain's foundation for healthy development and social cohesion and cooperation. Non-cognitive executive functions include the ability to focus attention and remain goal-oriented, to process information, and to effectively regulate emotional states. Executive functions are thus the gateway to efficiency in early learning and

performance, successful social interactions and developing psychological resilience to cope with rapid change.

Executive function depends critically on the quality of early childhood and early childhood education, and it is reinforced in the school years. Yet, education systems in many countries do not give it focus. In a world where facts come from the internet rather than from memory, the problem becomes determining which facts are real. We talk a lot about critical thinking and teaching it, but frankly we do it very poorly and randomly. New modes of teaching will be needed to be effective both in childhood and adolescence and in adult learning.

I have seen some exciting new modalities being tested using various intelligent computer systems, but again education is slow to change. We need to embed these new techniques across the curriculum rather than seeing them as some separate module of learning.

And literacy remains a challenge. Even in advanced countries, functional literacy is less than what many might think, especially for those with intergenerational disadvantage. They might be able to read words but not process the underlying concepts. And literacy now must be a concept that extends beyond reading and numbers. It must include civic, social and science literacy, and in this context this includes environmental literacy.

I do not mean every potential citizen needs to know the second law of thermodynamics or the details of heat capture and transfer; what they need to know is how science works, how scientific method allows us to work out what is most likely to be real and what is not. This is where science education needs to go, rather than teaching lots of boring isolated factoids. All children need that basic understanding of critical thinking, of how science works, of how we come to understand the world and what is happening. And the environment and nature are of course areas where examples can be derived to inform all forms of literacy and support critical thinking.

These are the three basics that have a critical role to play in dealing with a complex changing world, but now I come to the context of our warming planet and its implications for secondary and adult education. The Sustainable Development Goals, as a generalisation, mean little to most citizens and indeed to many policymakers. Why? In part it is because they artificially divide for convenience our future into 17 distinct goals. But we all know they are not distinct. Curbing climate change (goal 13) cannot be separated from the environmental goals, nor from social goals, economic goals, or from individual potential in many other goals. What we are talking about is explaining interrelationships, connections and systems thinking. This means starting to think and teach in transdisciplinary terms.

Citizens are not dumb; they know that things are inherently complex and that there is no free lunch, even though politicians often try to sell them the silver bullet. We need to teach in ways that reflect reality. How we do so may take time in developing the effective pedagogies. Problem based teaching is one methodology used especially in medicine, but there is much to learn from the emergence of futures studies and transdisciplinarity. Indeed, a greater focus on anticipatory framing may be a valuable tool in education.

Increasingly, young people want their education to feel relevant to them. Education needs in many places to shift its curriculum content to be more meaningful. While disciplinary knowledge is essential, the examples used can be much more relevant. For example, building mathematical models of some aspect of the climate challenge might be a far more useful way of teaching mathematics, science and other subjects than abstract calculus and physics.

The issues in climate competency extend further than just environmental science, and while in context this may be an appropriate subject, there are many other ways in which the above concepts can be transmitted. Systems-based teaching leads to the core issue that addressing climate competency needs: understanding trade-offs. We need to teach and talk honestly about trade-offs, and that is not possible without significant changes in both education and public discourse. It is the logical follow-on from my thoughts above on systems thinking and transdisciplinarity.

I haven't talked much about misinformation and disinformation. We all assume that critical thinking is the critical education defence to it. It may be, but we have much to learn about defining strategies to use against misinformation, and new issues will emerge. Social cohesion and trust in science and policy leadership may be the best defence. In my mind, it makes the combination of executive function, critical thinking and multiple literacies more urgent.

Finally, I want to focus on self-discovery and the principles of co-production of understanding. Citizen science is but one component. There are many other potential tools, for example computer-based energy models that individual citizens can play with to explore decision making options at different levels from the home to the continent. The United Kingdom's department of energy and climate change developed a very effective and valuable energy calculator that engaged citizens well on issues of what choices should be made in energy sources. I think there is enormous potential in such approaches. Co-design and co-production are much more effective with both adult and young learners than deficit approaches.

I have hardly focused on the details of climate change because it is not the details of the science that matter beyond some very basic concepts which do not need technical knowledge. In the end what I am suggesting requires some rethinking of the nature of compulsory formal education. But it also extends to informal education – how governments talk to their citizens, how organisations are more honest about the issues, how citizens are consulted and how options are proposed.

Ultimately, Europe needs a team of 500 million buying into a collective decision process with collective understanding. The education system can be a critical part of this, but I think more than incremental change will be needed. This is the place for high quality educational science.

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