# POLICYBRIEF

# Climate Change Education: From Critical Thinking to Critical Action

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## Highlights

Effective policy related to climate change education requires not only a commitment to teach and learn but a commitment to act. Research has shown that knowledge alone is insufficient for societies to change behaviour; therefore, policymakers must move beyond education systems that simply transmit knowledge to ones that promote graduates who are engaged in systemic change.

Recommendations:
- Emphasise action competence, not just knowledge, in developing curriculums and learning outcomes related to climate change literacy.
- Create learning environments in which students are able to practise action competence in responding to climate changes, by minimising operational policy and practices that contradict competencies being taught in relation to climate change.
- Target adult and senior learners for climate literacy and building action competence with regard to climate change.

## Education and Climate Change

Significant strides have been made in human development around the globe in the last 15 years. Measures of poverty reduction, health outcomes and access to education have improved. However, as our health, wealth and capacity have expanded, our natural resource base has shrunk. By trying to drive 21st century development with 20th century ideals, we are rapidly degrading the life support systems on which we depend for our survival. Climate change, caused by our energy consumption, over-exploitation of ecosystems and unsustainable consumption and production patterns, threatens to undo much of the progress that has been made. Climate change affects food security and water supplies through changing precipitation patterns, and impacts infrastructure through rising sea levels and the increasing intensity of storms, floods and droughts. As damage increases, economies will have to shift expenditures to disaster relief and away from social development, which means progress made under the Millennium Development Goals of 2000 could quickly backslide.

While there are numerous policy instruments and technical solutions for mitigating and responding to climate change, changing the behaviour of individuals and organisations will be the most critical component of the process. Indeed, investment in capacity development has been shown to have

the greatest cost-benefit value for adaptation to climate change (Lutz et al. 2014).  But while education is proposed as the most efficient mechanism for changing behaviour and improving climate literacy, it is unclear how to best deliver it (Mochizuki and Bryan 2015). While many education programmes around the world have done an excellent job building students' knowledge around the causes of climate change, little evidence exists that this knowledge is sufficient to change the behaviours responsible for climate change (Eilam and Trop 2012). Ironically, it is often the most educated that lead the most carbon intensive lifestyles, suggesting it is not more education that is needed, but different education. Furthermore, education policies tend to target youth, and seldom address climate literacy of the wider public. Meanwhile, the total amount of greenhouse gas (GHG) emissions in the atmosphere produced by human activity continues to rise.

This policy brief proposes a set of recommendations for closing the gap between knowledge and action, as well as for expanding the audience of climate change literacy and/ or education to the general public, tailoring messaging and outputs to different local contexts.

## Recommendation 1: Bridge "Learning to Know" and "Learning to Do"

Education policies should not focus solely on the causes and impacts of climate change. If the ultimate goal of climate change education is to cultivate students capable of using
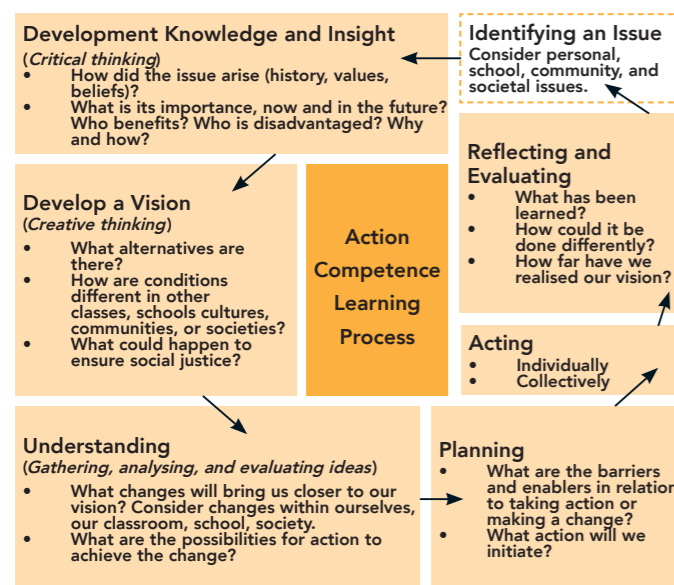


Figure 1: Action Competence Learning Process.
Source: adapted from Tasker 2000, p.10

knowledge for changing environmentally unsustainable behaviours or learning new adaptive behaviours, then curricular content must include components focusing on mitigation and adaption options at both the individual and systems level. Additionally, curricular policies cannot be deemed sufficient if they merely aim to develop "critical thinking" without any link to actionable solutions on the topic. This type of curricular policy model often leads to a cognitive gap — students have a high degree of theoretical knowledge on climate change and possible solutions (learning to know) but have low competencies in enacting these solutions (learning to do) (Negev et al. 2008).

This is not to say that curriculums should come with predetermined and prescribed actions — far from it. Because the impacts of climate change will be highly varied at the regional and local levels, many of the solutions to problems at these levels have not been identified at this point. Students should be encouraged to create their own solutions to the issue and attain the skills to implement them effectively. The important difference is that students should actively engage with the solutions they generate rather than simply demonstrate that they have the knowledge to generate them. If climate change education is to move beyond a mere analytical exercise and become a force for change, curricular objectives should shift from vague "critical thinking" outcomes to a solutions-focused "action competence" model — the ability to evaluate an array of possible actions, choose and effectively implement the one that best solves a given problem (Figure 1). A key component for actualising action competence on climate change in curriculums will be building teachers' capacities through teacher training programmes, in addition to professional development for in-service teachers.

One curriculum particularly suitable for translating knowledge into action is citizenship education (sometimes called civics or political studies). While the natural sciences and geography often teach the causes of climate change, citizenship education has great potential for cultivating agents of change who not only envision, but also enact solutions to climate change. Today's concept of citizenship education not only includes but also goes beyond the political–legal framework and involves the development of an ethos of shared rights and responsibilities, taking group decision-making, identity, diversity, justice and equity into account. An understanding of climate change and the link between the natural environment and civic institutions should be a crucial component of any citizenship curriculum (Wolf et al. 2009). Citizenship education gives students the

ability to apply the knowledge learned in the classroom and contribute to and/or transform society.

Climate change-relevant citizenship skills should include:

* ability to recognise the environmental, social and economic dimensions of climate change,
* ability to connect local actions and initiatives to global processes, and
* capacity to move from analysis to systematic action on climate change.

Curricular policies that encourage service learning — learning in which students are involved in community activities and projects — are an important element in embedding the topic of climate change within citizenship education. Service learning ensures equal focus on both the service provided and learning outcomes.

## Recommendation 2: Schools as Living Labs — Practising What We Preach

Although educational institutions operate under different mandates, in order to build legitimacy, policies that contradict the content of climate change curriculums should be minimised. Operational policies relating to resource use, procurement, zoning and transit should be reviewed in tandem with curricular policy in order to minimise contradictions between what is taught and what is done. Policies regarding how the institution manages its decision-making and engages with the wider community should also be reviewed (UNECE 2012). Curricular policies that attempt to bridge knowledge and action on climate change may lack legitimacy in the eyes of students, their families, and the community if schools themselves are perceived as contributing to the problem through their own practices.

Linking knowledge to action on climate change in curriculums will be more successful if education institutions have operational policies that allow students to practise action competence. Problem-solving and new behaviours only persist if they are practised enough to become habits (Knussen and Yule 2008). Therefore, policies should encourage school campuses to operate as living labs — places where students are involved in co-creating solutions and enacting them through real life behaviour. A living lab is a place where education is tied to the operations, decision-making and community engagement of the institution.

Because living labs focus on user innovation, they create opportunities for students to participate in the school's decision-making related to climate change response.

This plays a crucial role in developing students' action competence in relation to pro-environmental behaviour (Cincera and Krajhanzl 2013). While external factors may limit students' engagement with meaningful problem-solving and behaviour change outside of the classroom, living lab environments offer proving grounds where students can see that knowledge can be applied in their daily lives. The living labs approach allows educators, administrators, staff and community stakeholders to develop their own competencies in responding to climate change as well. This generates a culture of action competence in institutions as well as among the individuals within them.

## Recommendation 3: Engaging Youth as Well as Adults

A significant gap exists in climate change education in that the majority of policies have focused on primary and secondary education, without addressing the need for adult learners to engage with the topic outside of formal schooling systems. Globally, 40% of adults have never heard of climate change (Lee et al. 2015) and among the 60% that have, little evidence exists that this knowledge alone has translated into action — individual or organisational. If climate change education is to create a critical mass of change agents, policies need to build climate literacy and action competence in adults and seniors.

Creating education policies for adults focused on mitigating climate change is especially urgent considering the relationship between age and GHG emissions. While recent research suggests that GHG production per capita sharply decreases among the very old (those over 80), it steadily increases into one's mid-60s, and stays above the per capita emissions of those under 30 throughout one's 70s (Zagheni 2011). As life expectancy continually rises along with material aspirations around the world, this trend is likely to increase. While most climate change education policies are geared towards the youth, their GHG emissions per capita are relatively low, compared to their elders. In contrast, those over the age of 50 are carrying their high carbon lifestyles into an even older age.

Comprehensive education policies focused on adapting to climate change targeting those over 65 will be especially relevant, given that more seniors are living in coastal zones and metropolitan areas, regions especially vulnerable to a changing climate (Gamble et al. 2013). Educating seniors on the issue is not only strategic, but capitalises on their capacity as agents of change within their own generations and communities.

While sustainability in vocational and higher education has been a topic of interest for the last decades, education policies must be more ambitious if they wish to modify the behaviour of the world's adults and seniors. Formal education can teach youth the skills for responding to climate change. The challenge now is to shape non-formal climate change education for adults. Policies encouraging downsizing, smart city planning, public transit and sustainable food, energy and water systems will have to incorporate education components directly engaging older age cohorts who may be reluctant to alter their behaviours or learn new technologies. Public information campaigns, job training components and senior community seminars are just some of the tools that could be used. Government ministries and departments, businesses, non-governmental organisations and other civil society actors should work with education policy officials to synergise the climate change education policies within their own organisations.

**Note**
This policy brief is an outcome of the project Education for Sustainable Development (ESD), which was launched in 2003 in response to the resolution on the UN Decade of ESD (DESD: 2005–2014) adopted at the 57th session of the UN General Assembly. The project focuses on contributing to international sustainable development and ESD processes through developing multi-stakeholder networks and higher education alliances, enhancing leadership and capacity development, and advancing knowledge through policy-relevant research.

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