



Think Piece: Action Competence through Ethno-Geography

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The Two-Sided Problem of Climate Change and the Educational Challenge

Hardly a day passes without climate change being mentioned in the news. It affects people's way of living all over the world (IPCC, 2014) and is probably one of the greatest challenges of our time, including for future generations.

Climate change is due to the accelerated greenhouse effect caused by modern Western ways of living, in which factors like the burning of fossil fuels for energy and the high consumption of beef are perceived to be an essential part of living, but which emit increasing levels of greenhouse gases (e.g. carbon dioxide [CO₂] and methane) into the atmosphere. Greenhouse gases prevent long-wave radiation from escaping the Earth's atmosphere, thus causing a rise in the global temperature. People living in different places around the world may or may not experience the various consequences of this temperature rise in their daily lives. Depending on where one lives, these consequences might range from extended droughts to an increased number and intensity of storms, precipitation and flooding.¹

This two-sided problem, people's modern way of living influencing the global climate and their living conditions in turn being highly influenced by climate changes, is exemplary for the subject of Geography, which is about humans' interaction with nature (Physical Geography).

What are the challenges for climate change education in Geography, or other educational contexts for that matter? That this is indeed a challenge is evident from the fact that the problem of climate change has, at least in the last 25 years, received international attention, for example from the Intergovernmental Panel on Climate Change and the United Nations.² And although many people in South Africa and Denmark are well educated and should be aware of the problems associated with the emission of greenhouse gases, these two countries are still in the world's top 50 when it comes to emissions of CO₂ per citizen.³

A first issue is that people who practise a modern Western way of living seldom face the problems associated with greenhouse gas emissions – at least not right after they have caused the emissions. Instead, over time the increased concentration of greenhouse gases in the atmosphere and the resulting increase in the global temperature contribute to problems experienced in other regions, including on other continents. That is, the problem is not always experienced by the main contributors, or it is not experienced directly at the moment of contributing to it.

1 See <http://www.ipcc.ch/report/ar5/>, visited 7 May 2018.

2 See <https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter1.pdf> or <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>, both visited 7 May 2018.

3 The actual emission per citizen might vary according to source. See <http://www.globalis.dk/Statistik/CO2-udslip-per-indb> or <http://data.worldbank.org/indicator/EN.ATM.CO2E.PC>, both visited 2 October 2016.

Secondly, gases and global temperatures as physical entities are not easily perceived. Even though we inhale gases from the atmosphere all the time, we do not really think about them as a physical entity because we cannot readily observe them. It is also very difficult for people, especially those living in northwestern Europe, to perceive that global temperatures are rising, because in some years the perceived temperature is lower than the usual annual average temperature for the region. For some, this contradiction removes the motivation to take action. Some find it hard to accept the connection between the emission of greenhouse gases and the rise in temperature – a point of view also encouraged by certain opinion leaders.⁴

In other contexts, including many South African settings, the impact of climate changes is very visible,⁵ but it still seems hard to introduce the aspiration to address it. And it is clear that it is not easy for individuals, non-governmental organisations (NGOs) or public institutions to take action on the emission problem. To change lifestyles and development decisions requires a huge effort, since it affects our habits at many levels and the issue of climate change deals with large cognitive abstractions in time and space. This is the third educational challenge.

Here I propose that one way of tackling this challenge is to think of the different kinds of knowledge involved in climate change education.

Powerful Geographic Knowledge and Ethno-Geography

To understand the physical processes associated with climate change – the production of greenhouse gases and the associated rise in the global temperature – requires a certain amount of knowledge linked to Physical Geography. This kind of knowledge can be characterised as universal, rational, coherent and structured, and might be called powerful geographic knowledge (Stoltman, Lidstone & Kidman, 2015; Young & Muller, 2013).

However, to understand is one thing; to be able to change things is another. Powerful knowledge is only one aspect of being action competent (Jensen & Schnack, 1997). Besides knowledge, action competence also requires commitment, visions and action experiences (Jensen & Schnack, 1997). These aspects might be developed through active participation in projects founded in local communities and aimed at changing deeper structural, economic, social and political dimensions of the problem, drawing on people's everyday geographic experiences.

People's everyday geographical experiences can be characterised as untutored, tacit, implicit, unformed and unsystematic, and can be called ethno-geography (Catling & Martin, 2011). Thus, powerful geographical knowledge can be contrasted to ethno-geography. When climate changes affect people's daily lives in South Africa, such as less precipitation in the region around Alice and Fort Cox in the Eastern Cape, their ethno-geography might be challenged. To become action-competent citizens who are able to react according to the challenges requires a certain amount of help from outside, for example from local NGOs, university programmes or the municipality.

In the next section, I suggest an educational strategy of combining both powerful geographic knowledge and ethno-geographic knowledge, and a means of doing so in the context of

4 See <http://www.lomborg.com/> or http://www.ucusa.org/our-work/center-science-and-democracy/promoting-scientific-integrity/manipulation-of-global.html#.V_NnArn7Uq4, both visited 3 October 2016.

5 For example, the city of Cape Town's lack of drinking water.

practical projects, drawing on a reflection on climate change-related projects observed in Denmark and South Africa.

Climate Change-Related Interventions in South Africa and Denmark

As part of the research cooperation between Rhodes University, South Africa, and Aarhus University, Denmark, field trips to climate change-related interventions in the Eastern Cape of South Africa and Samsø Island in Denmark were undertaken from June to August of 2016.

Two kinds of programmes were visited during the field trips. The first were connected to organisations acting as change agents that intended to improve their own and other people's living conditions because of the negative consequences of climate change they had experienced. Near the town of Alice in the Eastern Cape province, the Amanzi for Food programme featured several interventions involving local people:

- A small-scale project at Lloyds Dam. The local small-scale farmers had faced extended drought periods, and the Amanzi for Food programme, started by the government and educational institution partners, aimed at improving water security through measures that local people themselves could undertake.
- As part of this initiative, Fort Cox College of Agriculture and Forestry, an important educational and research centre in the region for accumulating and distributing agricultural knowledge to students and local people, established a water security demonstration site.
- Just outside Alice, a retired teacher started a demonstration farming project in collaboration with experts from the local municipality, involving new methods and crops.
- Mrs Peters, who had previously been a nurse and also had her own business in Port Elisabeth, ran an ecologic food gardening project, supported by Rhodes University and other partners. She and other locals helped each other by sharing ideas and experiences developed over time; they also shared their local knowledge with the educational institutions. An important feature of the projects is the involvement of young people, thus securing local engagement and saving knowledge for future generations.

The second kind of programme involved government, NGOs and local people who intended to reduce contributions to climate change, predominantly by reducing the burning of fossil fuels. These programmes were:

- The NGO Energy Academy at the Island of Samsø, which intended to reduce the emission of greenhouse gases by empowering local people to produce energy in alternative ways rather than using fossil fuels. The Energy Academy especially emphasised the use of wind power, solar energy and biofuel. The Academy is subsidised by both public and private funds.
- The provincial Department of Economic Development and Environmental Affairs, which, among other things, intended to promote biofuel and wind power in the Eastern Cape.

- The Renewable Energy Training Centre, located at one of the Industrial Development Zones in East London, South Africa. The purpose of the Centre was to help new 'green' industries develop high-technologic know-how and specific skills among industry staff working with, or wanting to work with, renewable energy.

These interventions included people who wanted to make changes in order to improve living conditions for other people and future generations. This paper focuses on two cases, one each from South Africa and Denmark. It will show differences in how the change agents are trying to solve climate change problems, with a focus on bridging the gap between people's ethno-geographies and the use of powerful knowledge. In the conclusion I argue that these projects provide a good educational opportunity for doing the same with school and university students and other learners.

Case 1: Fort Cox College and Mrs Peters, South Africa

The Fort Cox College of Agriculture and Forestry is an established teaching and research institution located in the Eastern Cape. The large hinterland around the college has experienced impacts from climate changes in the form of extended droughts which impact the small-scale and subsistence farming on which many families depend for their livelihoods.

When visiting the college, Professor Rob O'Donoghue from Rhodes University introduced a newly invented drip irrigation system to teachers, students and local small-scale farmers. The lesson was organised as a general introduction by Rob, followed by hands-on experience and then discussions and sharing of ideas among all the participants. When organising lessons like this, Rob and the college teachers made powerful geographical knowledge available to locals and students concerning how to optimise the irrigation system, the appropriate time of year to use it, etc.

The group of local small-scale farmers knew each other well and had a habit of helping each other. All of them were dedicated to developing their small-scale farming, motivated not just by the need to increase their income, but also to make the farming sustainable from a cultural point of view. They were all born in the area, and although some had been living in cities such as Johannesburg for decades, they had returned. They were motivated to keep the heritage from earlier farmers alive. They had started growing the *Moringa oleifera* tree and developed several products from it.⁶ Mrs Peters, who was very enthusiastic, had also started her own ecologic gardening and cultivation of small-scale crops in the nearby village. She seemed to act as the key local change agent, involving both adults and teenagers in her projects. A characteristic of all these projects was the mutual sharing of ideas and experiences among those involved, and helping each other with manual work when necessary. For example, they tried to collect knowledge about the local landscape (it turned out that, for some reason or another, some parts of the soil were much more fertile than others) and old ways of cultivating the soil. This group of small-scale farmers contributed a lot of contextual local knowledge (ethno-geography) when discussing the drip irrigation system with the teachers and students at Fort Cox College.

6 See <http://idealbite.com/do-not-try-moringa-oleifera-until-you-read-the-facts-about-it/>, visited 2 October 2016.

When different people contributed with powerful geographic knowledge as well as ethno-geographic knowledge, the lesson conducted by Rob at Fort Cox College conveyed different knowledge paradigms to the participants. The lesson acted to bridge the gap between powerful geographic knowledge and ethno-geography. Both knowledge paradigms could contribute to the education and personal development of the next generation of new farmers in South Africa, where new technologies could be used in connection with local knowledge, and, in the process, contribute to climate change adaptation and withstanding the climatic changes the region is experiencing.

Case 2: The Energy Academy at the island of Samsø, Denmark

In 1997 the island of Samsø was appointed to become self-sufficient with energy and ten years later, in 2007, the Energy Academy was established. In 2010 Samsø became self-sufficient with renewable energy (wind power, biofuel and solar energy).⁷ The Energy Academy is an NGO with five to ten employees, which, considering the number of citizens on the island (nearly 4 000), is relatively large.

The Academy can be characterised as an informal learning centre, where one of the aims, as explained by one of the leaders, Malene Lundén, is ‘the sharing of knowledge (related to energy solutions) among its participants’.⁸ As outlined by the founder of the Academy, Søren Hermansen, the main aim is not to ‘save the world from climate change’ but rather to positively develop the local society of Samsø. In other words, the issue of climate change is not the goal of the activities but rather an important means for initiating the development of the local society. Like many rural societies with a peripheral location, Samsø has come under pressure because of issues such as the migration of young people and the lack of local industries. These geographical features are well known in many outlying areas around the world, including some of the locations we visited during our field trip in South Africa.

Even though the Energy Academy is an informal learning centre, it has established connections to the formal education system in the form of visits by school pupils and university students, and association agreements with universities all over the world. In this way it has brought attention and activity to itself and to Samsø Island as a whole. This implies that the Energy Academy has two foci – to be a central change agent in terms of further positive development of Samsø, and at the same time to establish itself as part of educational systems. Though climate change was not the reason for starting the renewable energy project on the island, by focusing on climate change the Academy has emphasised a topic which is newsworthy and has universal implications.

When hosting visits from schools abroad, the Energy Academy occasionally hires people from the ‘outside’ who have specialised (powerful) knowledge related to the learning activities offered. When we visited the Academy, an external person was conducting a course on how pupils could make solar panels as an energy source for their cell phones and other equipment familiar to them. According to Malene and Søren, the basic idea of the Energy Academy’s

⁷ See <http://energiakademiet.dk/en/om-energiakademiet/>, visited 2 October 2016.

⁸ Quotes from Malene Lundén and Søren Hermansen, when meeting them at Samsø, 07.06.2016.

courses is for students to experience and use concrete examples from their everyday lives, and to see more general links to energy consumption. Another objective is awakening joy and interest in the students by using humour, drama and what Malene called 'the forbidden'. Drama is also used as a tool for lifting the students' own stories into the context of what is going on at the Energy Academy. Analysed into a pedagogical discourse for Geography, it seems that part of Malene's pedagogy is based on an ethno-geographic stand that emphasises students' everyday perspectives, own stories and experiences, which are interrelated with academic perspectives or what might be called powerful geographic knowledge (Catling & Martin, 2011).

Concluding Reflection

In the context of science education, Ratcliffe and Grace (2003) as well as Zeidler and Keefer (2003) argue that environmental issues, such as climate change, can be regarded as a socio-scientific issue. When engaging with socio-scientific issues, which are often connected to citizenship, students would need to (learn to) be able to take part in related discussions, take a stand and may even develop action competence. Being action competent requires knowledge, vision, commitment and action experiences (Jensen & Schnack, 1997). Being action competent might be regarded as an overarching purpose for teaching activities in formal and informal learning environments, even if it is an ideal which can never be reached (Mogensen & Schnack, 2010). It is a compelling purpose for teaching activities connected to climate change, and, based on the case examples discussed here, bridging the gap between powerful knowledge and learners' ethno-geographies could be an important component of education towards action competence in the face of climate change. Catling and Martin (2011) warn that bridging the gap between powerful knowledge and learners' ethno-geographies is not an easy task for formal learning environments. Teaching (only) powerful geographic knowledge is the norm at schools and universities, but it is only one aspect of the action competence required to tackle climate change. The learners' visions, commitment and action experiences are other relevant aspects of learning, and it is argued here that this can be cultivated through their engagement in local development projects. The Amanzi for Food projects, and some of the projects initiated by the Energy Academy, are examples of such learning opportunities.

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