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A Climate Academy in a Secondary School, A New Pedagogical Strategy for Climate Education

Duquenne Nicolas[1], Epps Tereza[2]

European School of Brussels 2, Belgium[1&2]

Abstract

Climate change is the biggest challenge that humankind must face. In February 2020, UNDP launched a survey which reached 1.22 billion of participants whom 550 000 younger than 18, from 50 countries. One year later, University of Oxford published the results in the "People's Climate Vote" report. For 64 % of participants, "climate change was an emergency" [1]

Moreover, through a clear analysis, "the most profound socio-demographic driver of belief in the climate emergency and climate action is a person's educational background"

Education is then a powerful lever of action to handle to tackle the global warming and its consequences. The next generation brings also hope because people under 18 are even more numerous (69%) to consider the climate change as an emergency.

Education goals follow an accurate timeline: to know, to understand and to pass on the past; to be consistent with present time; to prepare the future by innovating and by bridging our legacy.

The education of science respects this description but as the same time it adds its own subjects' specificities: biology, physics, chemistry etc…Scientific knowledge often are built and taught in a very specialized and vertical way, with a double purpose: "by focusing on the way this new knowledge is put at the service of society -technology- or by contributing to the development of new knowledge - research" [2]

With its multiple human causes and its consequences in every aspect of our daily life and its immediacy, the climate change demands a total shift of paradigm to foster its education.

The program which will be discussed is named "The Climate Academy". It has been initiated 10 years ago at a local scale by my colleague Matthew Pye in the European School of Brussels 2. The Climate Academy aims to tackle the compulsory revolution in secondary schools. It targets to become an innovative pilot program within the European Schools network.

This comprehensive program roots and relies on scientific knowledge about causes of consequences of climate change; it promotes a civic engagement and mobilises the entrepreneurial skills of students.

Keywords: *Climate change, education, school, systemic change, civic engagement, Anthropocene*

1. Introduction

1.1 International and European legislative context

In 2015 the ratification of the Paris Agreements included an article (art 12) that emphasizes the key role that education must play to tackle the climate change.

"Parties shall cooperate in taking measures, as appropriate, to enhance climate change education, training, […] public access to information, recognizing the importance of these steps with respect to enhancing actions under this Agreement. [3]

The European Green Deal promotes many initiatives. Within this set of policies, the "European Sustainability Competence Framework, GreenComp" aims to provide to learners a common background. GreenComp is "a competence-based education that helps learners develop sustainability skills based on knowledge and attitudes can help promote responsible action and stimulate willingness to take or demand action at local, national and global level" [4]

1.2 Local educational context

Like all European Schools, the EEBII provides children with a multilingual and multicultural education at nursery, primary and secondary levels. Aimed primarily for children of staff of the European Institutions, the school follows a specific curriculum and offers the European Baccalaureate diploma. Having European political and scientific institutions so close make connections with our students easy.

The Academy fills a profound lack in secondary education about the fully systemic nature of the crisis. Moreover, whilst affirming the importance of individual actions, it takes students far beyond these and fully engages them in acting and advocating for structural changes - as citizens with a wonderful range of talents

2. The Climate Academy in EEB2

2.1 Teachers and academics' perspective

The Climate Academy offers students the opportunity to learn about climate change in its systemic dimensions by accessing academic knowledge and by developing forward-thinking civic and entrepreneurial skills.

IPCC and IPBES reports are used as reference to demonstrate the scientific truth about climate change. Endorsements from scientists allow to build complex concepts with students such as tipping points, or planetary boundaries.[5]

Social, economic, and biological consequences are progressively introduced by reading articles. The systemic thought shapes by identifying ramifications and interactions between single components, by drawing synergies between different stakeholders.

Students' engagement from the Climate Academy appears at many levels:

- Inside classes, students develop peer-learning skills when teachers ask them to co-design a lesson.
- In school, students designed and achieved a wall to call for action. They also organise conferences and lectures.
- Outside the school, many members participated to international events.
- Worldwide with News Decoder, a professional organisation supervising students in their journalistic process, a series of podcasts inspired by the book "Facing the Anthropocene" has been broadcasted.

These civic engagements predictably articulate with the third pilar of the academy: entrepreneurship. For instance, the "Writing's on the Wall" project required for a compulsory coordination between many stakeholders: management, technical workers, artists, etc…

Translations of articles and scientific books are currently underway because of the language skills of our students.

To conclude, the Climate Academy through its innovative educational methodology is consistent with the European Reference Framework for Key Competences for Lifelong Learning (EC 2018) [6] and its academic branch called "8 key competences"

This project-based pedagogy is fundamentally cross-curricular and often transdisciplinary. It empowers the students as active learners.

2.2 Students 'perspectives

The core commitment is one formal teaching period in the students' official school timetable, with projects that they develop plugged into this. At the start of the cycle, the emphasis is on the systemic understanding, and the students progressively become more autonomous in the projects and learning.

Students are taught knowledge about the climate crisis in an interesting and interactive way that leaves room for the students to express their opinions on relating topics. Reading scientific books is one important aspect, but by doing research themselves the students increase that knowledge even further.

The CA offers its students members a variety of opportunities to develop their organizational, entrepreneurial, oratory, research skills. The students all have a strong motivation to tackle climate change and need the right tools to help them get a better, more scientific understanding on the issue, rather than learning just by themselves, and the Climate Academy offers that consistency.

In addition to the beneficial skill set the students will have attained through many years of involvement in the Climate Academy, the students who will have gained the ability to think through the system will know exactly what to do as conscious citizens, like electing leaders through their green engagements. The more we integrate this type of academy in schools, the more the youth of today will have a chance to do better than the past generations in making the right legal decisions in the future.

2.3 Results

Within few years, members of the Academy have acquired enough skills and knowledge to integrate a complex thinking. Having a mature, structured, and interconnected view of the crisis enables them to actively participate to prestigious events.

May 2022, 2 students were invited to the kick-off meeting of the European “Climate Coalition” program.
This autumn, one student was involved in the discussion for the Pre-COP 26 in Glasgow.
3 others joined the European Soil Observatory Young Soil Researchers Forum hosted by the JRC.
The credibility and the engagement of teachers and students are both strengthened by the endorsement of top scientists like Kevin Anderson from the University of Manchester.
The partnership with News Decoder is rewarded by an Erasmus + grant to promote the dissemination of the Writing’s on the Wall project all around European schools.

3 Discussion

3.1 Teach the systemic dimension of the climate academy

The study of the book “Facing the Anthropocene” [7] has anchored the Climate Academy in the complex but systemic theme of the Anthropocene.
The Anthropocene is the prevailing concept in the study of climate change. It establishes the complex interactions with 3 fundamental dimensions: climate, the biosphere as a whole and human societies.
Since the Anthropocene is a scientific and not a political concept, it provides a safe zone for teachers to ask deeper and more holistic questions, something that is less evident with the broader label, “the environment”. It allows the teaching of climate change to be situated first in the scientific field, then in the sociological field, and finally in its philosophical and political dimensions, free from any ideology or militancy.

3.2 A new and comprehensive subject in education

Unlike the so-called Newtonian sciences, which analyse phenomena by reducing them to a set of individual elements easy to understand, climate change education must confront, and bond knowledge.
If learning to doubt and to accept uncertainty are major challenges in science education, climate change education also requires a cross-cutting necessity.
By bringing our Climate Academy students into this interconnected multidisciplinary reality, they develop thinking skills and acquire an analytical and critical mind.

3.3 Long-term scope of education vs climate emergency

The *acceleration* of our society is the theory developed by the German sociologist Hartmut Rosa. The symptoms of this acceleration are the multiplication of ecological, democratic, and psychological crises that the world is experiencing. The consequence of this acceleration is an existence in the form of "projects" with no projection into the future and no attachments or extensions in time and space. According to Hartmut Rosa, this *acceleration* leads to a weakening of political action which is positioned more as a re-action to already existing facts rather than an action capable of influencing the course of history.
According to the sociologist, a solution to this race of time must be found not in any deceleration but in a *resonance*. This concept is defined as "a cognitive, affective and bodily relationship to the world in which the subject is affected...by a fragment of the world, and where, on the other hand, he or she "responds" to the world by acting concretely on it, thus experiencing its effectiveness" [8].
This resonance echoes the objectives of the Climate Academy, which proposes firstly to open up to the world through scientific knowledge but also through our feelings, and secondly to act on it while recognising our action.

4 Perspectives and conclusion

Within a relatively short period of time, the academy should be able to serve as a comprehensive programme for teaching climate change in a systemic approach within the network of European schools.
The support obtained by the Erasmus + programme should allow the extension of the "Writing's on the Wall" project to many European secondary schools.
The extensive work of co-writing and co-creating a climate academy reference manual will also be completed during 2022. This will be aimed at educating both pupils and teachers. Numerous studies have shown that one of the main obstacles to the implementation of climate change education is the lack of solid, synthetic, and accessible training in the field. Bibliometric studies [9] show that more than 25,000 articles are published each year on this topic. This makes it almost impossible for primary and secondary school teachers to follow up.
The value and recognition of students' commitment is based on the development of academic certificates validated by the authorities of the European Schools network. These certificates are

currently being developed and are based on the competences referenced in the GreenComp framework, itself supported by the European Directorate-General for Education and Culture (DG EAC)

References

[1] Flynn C, Yamasumi E. (UNDP) Fisher S and al (University of Oxford). “Peoples' Climate Vote. Results”, United Nations Development Programme (UNDP), 2021, pp 45-46
[2] Léna P, Wilgenbus D, and al. “Eduquer en Anthropocène”, les bords de l’eau, 2019, p 147
[3] https://unfccc.int/sites/default/files/english_paris_agreement.pdf, p 16
[4] https://publications.jrc.ec.europa.eu/repository/handle/JRC128040
[5] https://www.consilium.europa.eu/media/35296/st09078-en18.pdf
[6] Steffen W and al, Planetary Boundaries, Science, Vol 347 Issue 6223, 2015
[7] Angus I, Facing the Anthropocene, Monthly Review Press, 2016
[8] Rosa H, Résonance, La Découverte, 2021, p147
[9] Haunschild R, Climate Change Research in View of Bibliometrics, Plos One , 2016