Orienting the young in the complexity of climate change to foster agency and decision-making in societally relevant choices

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Abstract. Recent reports highlight that general population seems increasingly aware of climate change. However, forms of radical activism are showing a lack of orientation among young people, who have trouble understanding deeply the complexity of the issue and how to become agents of change. There is a lively research debate, across several disciplines, about how to conceive agency in the field of climate change. The overarching goal of this study is to respond to these phenomena by unpacking the concept of agency from three disciplinary perspectives, including both individual action and political participation, and incorporate it in science education programs.

Introduction and theoretical framework

The young generations show an unprecedent willingness to contribute to climate change (CC) abatement. However, surveys show that false beliefs about CC are widespread, with the result of concentrating efforts on ineffective actions [1]. Forms of radical activism are taking place, and show a lack of orientation among the young, who have trouble understanding how to become agents of change [2]. Those false beliefs should perhaps not come as a surprise [3]. Educating students, our future leaders, decision-makers, and citizens, about socio-ecological challenges now is critical [4]. The improvement of science education in schools, despite being in the UNESCO agenda for over 60 years, is still underrealized. Almost half of the national curricula worldwide do not refer explicitly to CC [5]. The educational systems, however, play a crucial role in fostering learners' ability to construct coherent pictures of the complexity of the present, and empowering them to develop transformative agency Anthropocene [6]. The importance of incorporating social and transformative dimensions of science into school curricula has been widely investigated in science education in recent years [7]. However, the point is how to do this effectively since the complexity of the processes involved in CC and the difficulty of associating one's own actions with CC often lead to inaction. Educational systems are called to foster learners' ability to construct coherent pictures of the complexity, which aligns with cultivating their scientific literacy and empowering them with the agency to be future-aware.

In this work at the core of anew funded project named ENCOMPASS, cross-cutting knowledge, expertise, and methodologies from the lenses of philosophy, economics, and science education are combined to investigate agency in of CC, as well as to provide a reflection on how school education can equip students to critically engage with scientific knowledge to foster decision-making and agency in societally relevant choices.

Concept and methodologies

ENCOMPASS is built on an inter/multi-disciplinary environment between philosophy, economics, and science education. To pursue its scope, ENCOMPASS is utilising inter/multi-disciplinary approaches and methods belonging to the three different disciplines to observe CC agency through different lenses. In synthesis:

• *Philosophy:* through this lens, an investigation of young people's beliefs about CC and related actions is conducting by referring to existing surveys and analysing statements and programs of

young activist groups. The purposes of this investigation are: i) revealing possible gaps in young people's knowledge of CC; ii) identifying inconsistencies between the actions performed and the goals set; and iii) reflecting on the roles of science and expertise in democratic deliberation.

• *Economics:* Through this lens, by using primary data collection, the research investigates a wide set of variables characterising individuals and their willingness to act in a climate-friendly manner. The aim is to better understand individual behaviour and the link between the climate beliefs and willingness to act with other personal and context-related variables. The effectiveness of specific informational cues in changing behavioural intentions will be investigated in order to get insights on modelling approaches and didactic tools to foster deliberation and action on CC.

• *Science education*: through this lens, a systematic analysis on the main reports [6] on climate change and sustainability knowledge, skills, attitude is undertaken to unpack the concept of agency. This analysis is first step of an iterative process identify strategies, methodologies and tools within science education able to equip students to critically engage with scientific knowledge, which will foster their decision-making and support them to become agents of change.

The three lenses from three disciplines are investigating separately the concept of agency in the context of CC and so as to come out with design principles that will be implemented in two case studies during the second year of the project.

Conclusion

This work is geared towards the ambitious and long-term impact of creating a more resilient, cohesive, inclusive, open, and democratic society. To do so, we are considering and integrating innovative approaches coming from three different disciplines so as to adapt education to the evolving, complex needs of our society, as well as to connect education and training to emerging social needs and deepen the knowledge in society about the required green and sustainable transition. In particular, in unpacking the concept of agency, the work aspires to contribute to creating, through school education, a society where the young generation will: be responsive to existing and unexpected threats and disasters; aspire toward, envision, and plan for a better future within the uncertain contexts of current society; and empower themselves as citizens to identify, devise, and put into action mitigation and adaptation strategies.

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