Design of a narrative approach for addressing uncertainty in Climate Change Education

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Abstract. Climate Change is posing new challenges to science education. One of them is finding effective ways to help students conceptualise and deal with uncertainty and risk. This study aims at identifying and analysing what we call "narrative lines" of CC discourse, in order to implement an educational approach that adopts a narrative perspective to address uncertainties within climate change education.

State of the art

Climate Change (CC) is severely impacting society's culture, questioning modern human relation with planet Earth, our perception of time and the way we conceptualise and deal with uncertainty and risk [1]. The role of uncertainty in the scientific process and the different types of uncertainty characterising CC as a complex issue has been channelled to improve decision-making processes [2] and to help the youngster in developing sustainability competencies [3]. At the same time, an emerging body of literature strongly suggests careful attention to the role of narratives in CC education for its ability to help people make sense of experience [4], navigate change [5] and imagine future scenarios [6]. Looking at the CC science literature of the last decade, it is interesting to notice that narratives are intrinsic in different aspects of CC and Climate Change education (CCE) discourse. For example, the climate change crisis and its historical evolution can be seen or crafted as narrative, and some research is already analysing this phenomenon in institutional communication [7]. While if we use a broad definition of narratives as "temporally organised actions or events", CC science has made wide use of it as a research tool to investigate uncertainty and risk within the storyline approach and scenario-analysis [8,9]. Moreover, scenario-building techniques have also been adapted by future-oriented science education to work as educational tools to foster imagination and agency [3].

In view of the above, the aim of this research contribution is to identify and analyse what we call "narrative lines" of CC discourse, in order to point out their educational potentialities. Therefore, the RQ addressed in this specific study is: *Which kind of "narrative lines" can be identified in CC discourse in order to implement a narrative approach to teaching/learning CC uncertainty?* This question is part of a bigger research, located inside the EU project CLIMADEMY [10], whose purpose is to investigate how and to what extent a narrative approach can be effective to develop consciousness, imagination and attitudes to deal with CC's uncertainties.

Methods

This project is framed within a design-based research approach [11]. The studies conducted so far derive from an original educational activity, called "Mocku for Change" [12] and aimed at exploring the use of mockumentary genre (fictional stories in the aesthetics of documentaries) as a tool to help learners build "fictional yet realistic" CC stories by stimulating a reflection upon CC future scenarios. Two implementations have been performed. During the first, held at the end of a CC course, students were introduced to the mockumentary genre and asked to produce a short video in that style about Climate Change. The results from the first implementation informed the design of a second implementation by suggesting to address uncertainty as a more specific CC concept. During the second implementation, to create their

video, learners were introduced both to the mockumentary genre and to the different types of uncertainties characterising CC. Our perspective on CC uncertainty is from a physics point of view and has been influenced by the educational reconstruction of the storyline approach [3,8].

Preliminary results and future goals

Preliminary results showed that most of the features of the mockumentary genre that proved to be useful tools for addressing uncertainty issues were, more generally, features of the narrative language, such as "temporality" and "agentivity" [7]. Because of that, we were pushed to redefine our research objective into *investigating how to exploit narrative structure/features intrinsic in CC discourse to balance scientific/argumentative language when addressing uncertainty in CCE.* New insights from the literature and a new theoretical analysis are guiding the design of the above-mentioned narrative approach. Specifically, the work carried out at the moment involves crafting what we called "narrative lines" in CC discourse, defined as temporally organised events effectively chosen to address a specific aspect of CC uncertainty. Possible narrative areas investigated at the moment are: history of Climate's physics, history of CC policies, local stories of mitigation and adaptation efforts, stories of activism, SSPs narrative scenarios, and fictional CC narratives. The ongoing analysis will lead to pointing out a set of features for the narrative approach and a set of principles to design activities for secondary school students.

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