Proceeding Paper

Change the Story, Learning to Make a Difference in Climate Crisis †

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Abstract: We describe the results of the Italian piloting of Change the Story, a cross-European project that takes an innovative look at climate and citizenship education. The project developed resources to support teachers and pupils in creating digital narratives about the kind of world they want as a response to the climate crisis, with the aim of both improving scientific enquiry and developing citizenship competences to actively contribute to building a climate-neutral society.

Keywords: climate education; environmental citizenship; action competences; sustainability inquire learning; digital storytelling; place-based education

1. Introduction

Engaging young people to become change-makers [1] in the large challenges of the climate and sustainability crisis requires new educational approaches to empower students to make decisions and move towards social change, going beyond fostering students' environmental awareness. Education has been recognised as a critical element to deliver sustainable development [2,3] (UNESCO, 2012; UNESCO, 2014) and educative institutions need to delineate pedagogies to promote the potentialities embraced by sustainability challenges to effectively work on students' action and citizenship competences [4] allowing them to be ready to build a better world for all.

In this context, a group of six European education organizations have explored this issue within the project named Change the Story, co-funded by the Erasmus+ programme of the European Union [5], which has focused on digital storytelling as a coherent frame for students' research into and exploration of climate change to empower them to become agents of change with their friends and community.

2. Research Design and Methodology

We worked together with 10 teachers and 60 students during the 2020–2021 school year. Action research [6] was set up to outline the educational foundation for intentional environmental and civic climate action within primary education settings.

Firstly, a flow of learning grounded in the inquiry-based approach [7,8], which also includes the local community as an educational resource [9] and a creative approach of digital storytelling [10], was established to guide the co-design and the evaluation of curriculum units, together with the assessment tools used to chart the competence development progress made by students, as described in Table 1.

A framework document, gathered from the widely used framework TPACK [11], has been outlined, which lays out the principles and thinking behind the design of the Change the Story learning units.

Table 1. Dimension of the competences considered in Change the Story.

Competence	Competence Description	Indicators
Pupils can find, evaluate and use information about past, present and future climate change	Search, organize and use information for specific purposes	Search information from a variety of digital or non-digital sources Evaluate authenticity, reliability, or validity to interpret or use information Use and share information effectively and ethically
Pupils can think in a critical way to show how change in people's practices is possible	Ask, enquire, synthesize, evaluate	Questioning and analyzing evidence of climate change Extend understanding of climate change Apply scientific approach to analyze, evaluate, and take actions on climate change
Pupils can work with others to develop their digital story about the climate crisis.	Participate, collaborate data	Share responsibility Value the contributions of others Demonstrate sensitivity to other audience or contexts
Pupils can create contents about and for the planet, living organisms and people, including themselves	Apply ideas in new ways, create something of value, elaborate data	Create new narratives for the future within digital and not-digital contexts
Pupils can communicate with others	Share, exchange ideas considering impact, respect for others	Produce and share coherent and cohesive contents on climate change through digital or non-digital, oral, written, or non-verbal means.
Take responsibility on how to tackle the climate crisis	Acknowledge and accept the choices made	Demonstrate responsible citizenship through actions that contribute to sustainable communities. Evaluate the impact of decisions or actions on the dignity and well-being of individuals or communities

3. Findings

Pupils showed progression in climate literacy and the development of both sustainability and digital competencies, as shown in Figure 1. Students built an interdisciplinary approach to climate crisis and were able to make connections and interrelations between facts, data and climate data visualization. The communication phase, carried out through digital storytelling, triggered the motivation to re-elaborate findings and to create an effective call to action for schoolmates and friends. In particular, the process of creating digital stories (for some examples, see Figure 2) was found to actively enable and engage pupils in:

- Researching and understanding the basic physical science basis behind climate change;
- Searching for causes, effects and solutions;
- Having real-world experiences and observing their environment and society regarding climate change;
- Reflecting and making connections within the frames of time (past, present, future) and dimension (the self, the community, the global society).
- Expressing their ideas on climate crisis and on what they want to change in order to build a climate-neutral society.
- Competences development data were collected with self-reflection tools such as the one described in Table 2. The results are summarized in Figure 3.
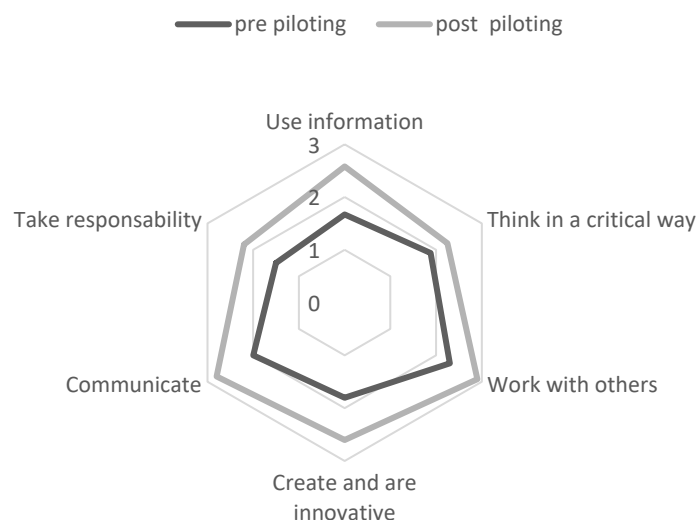
Figure 1. Results of teachers pre- and post-piloting competences assessment.

Table 2. Change the Story aimed to support pupils in developing and self-reflecting on their own digital stories about the climate crisis. Since the goal is that pupils prepare and communicate stories that are powerful to them, formative assessment tools supported content knowledge and competences development process. This example of a self-reflection tool was used throughout the process of producing a digital story about the climate crisis.

| I Can	Starting	On the Way	Indipendent
Inspiring others through a digital story about the climate crisis	I still need to learn about some digital tools that help me to share my story with others.	I have learned about some digital tools. Now I need to find out how they can help me to share my story with others.	I can use digital tools to share and communicate effectively to different audiences.
Investigating the past and present	I am still learning about how to investigate and understand changes in the past, and how this influences the present climate.	I am investigating changes in the past, to find out how this influences the present climate.	I can investigate and understand changes in the past in relation to the present climate situation.
Sharing of my ideas for making changes	I still need to learn about how I can be part of making change	I am starting to learn about how to be part of making change.	I can be part of making change.
Changing things in the present for climate crisis	I still need to learn how people, including myself can make changes in the present.	I'm learning how people including myself can make a change in the present.	I'm aware of how people are influencing and can make changes.
Working with others	I still need to find out how I can work with others (pupils, teachers, parents, friends or other experts) to create a new story which tackles the climate crisis.	I am starting to find out how I can work with others to create a new story about what we can do about the future climate.	I can work with others to create a new story which tackles the climate crisis.

|(**a**)|(**b**)|
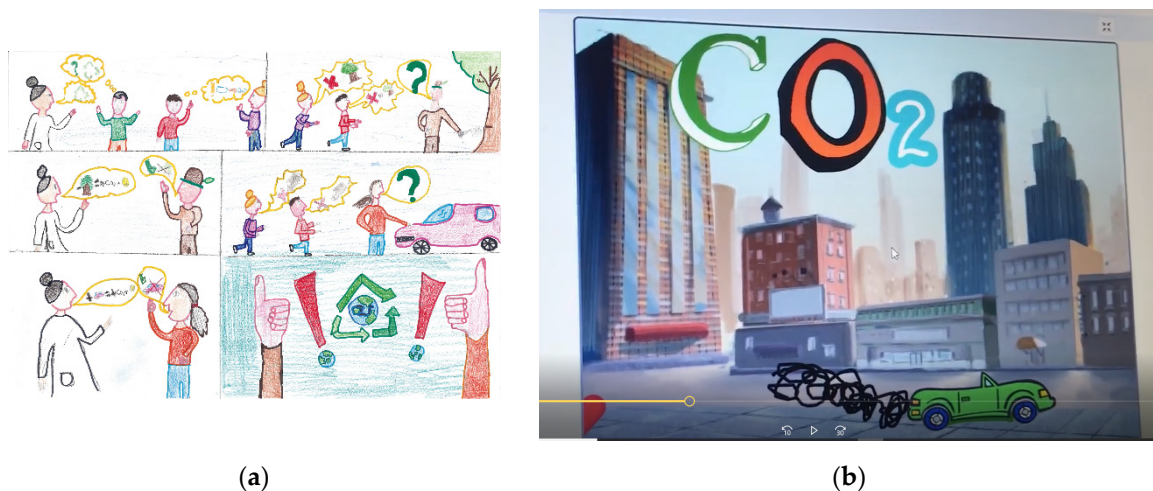
Figure 2. Example of stories created by pupils. The creative components and the communication phase of the learning flow of the project were inspirational and motivating for participating students: (**a**) storyboard for the story *We are ambassadors. [we need urgently to talk to you about climate crisis]*; (**b**) *Stop to unnecessary CO₂ emission [Yes, it is still possible!]*. This video, made with Minecraft, emphasizes what adults should do to cut their carbon emissions.
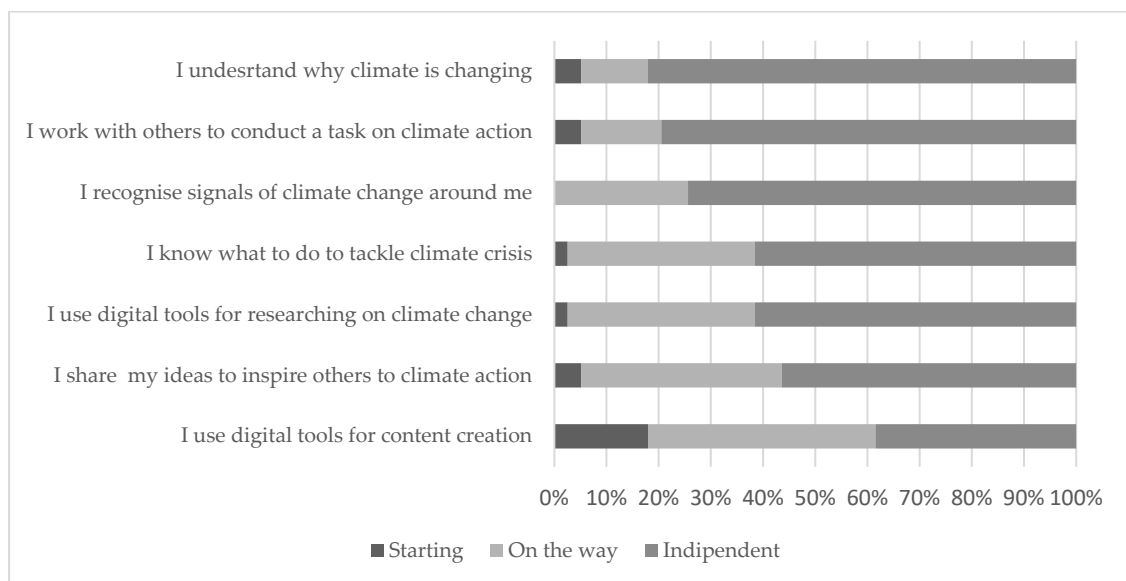

Figure 3. Results from pupils' self-assessment of content knowledge and competences development after completing the piloting.

4. Conclusions

The inquiry approach, revised to include an imaginative, creative phase for digital storytelling, was shown to be an access point for engaging in learning, enhancing scientific, digital and climate literacy, persisting in problem-solving and civic action, promoting collaboration and cooperative work between students, teachers and the community. Work on a real-world content, the climate crisis, has also received positive feedback when developed in the curricular disciplines, as it made learning more meaningful and applicable for students, thus influencing their motivation and the possibilities to learn to act for sustainability [12,13].

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