Innovative communication approaches to enhance climate and air quality literacy and public awareness

Earth Sciences Department

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

Inés Martín del Real, Andria Nicodemou, Diana Urquiza, Marta Terrado
Earth Sciences Department - Barcelona Supercomputing Center (BSC-CNS)
Contact: ines.martin@bsc.es

Climate change and air quality are urgent issues that society needs to tackle and are found at the forefront of many research projects. However, science often fails to significantly influence behaviours, opinions, or actions. This is known as the **knowledge-action gap.** To address these challenges, science communication and dissemination play a key role in research projects increasing public awareness and engagement, fostering transformative change.

Selecting the right formats and communication channels for each target audience is key for effective engagement. Many tools and innovative approaches exist for enhancing the understanding of complex scientific information by different audiences. Storytelling, art and visualisations are key elements for evoking emotions and making scientific knowledge more accessible, improving the scientific literacy of society.

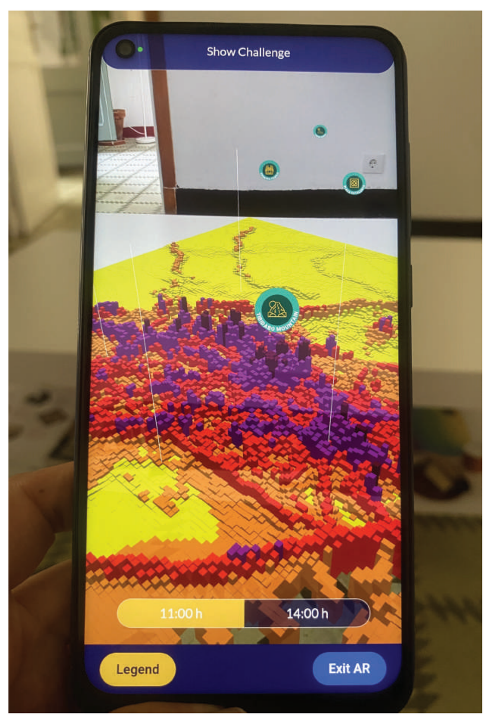
We present three different innovative communication products that explain complex issues related to climate and air quality services:

An educational journey against air pollution

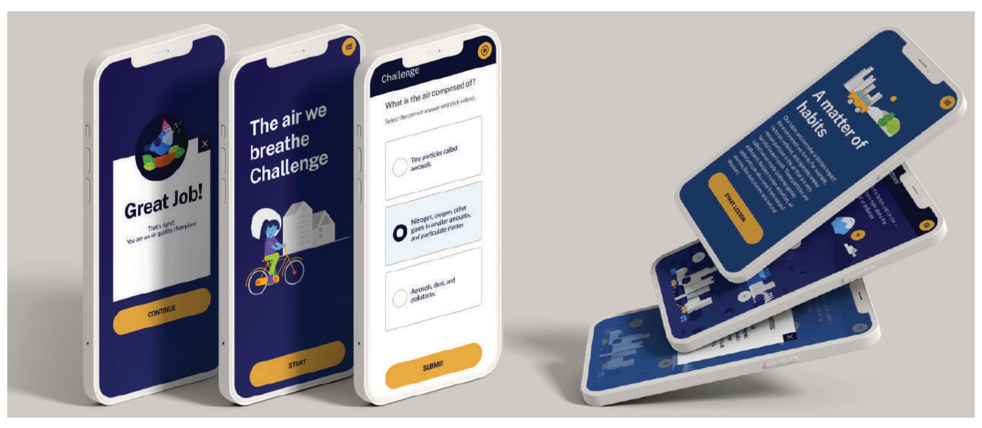
The GreenAir App is a gamified educational application for students to learn the basic concepts of air quality and pollution.

Educating younger audiences about the impacts of air pollution on health and the environment encourages proactive engagement and influences families and communities towards collective action for cleaner air.

GreenAir App is a dynamic and interactive web-based application that **integrates gamification techniques and augmented reality (AR) features**.



Example of the AR feature of the GreenAir App.



Images of the gamification features of the GreenAir App.

The AR features allow students to explore air quality index maps, using **real data from the CALIOPE modelling system** developed by the BSC.

The development of the GreenAir App followed the **Human-Centred Design approach**.

This methodology prioritises the needs of the target users throughout the design process, ensuring that digital educational initiatives deeply connect with learners and foster meaningful engagement.

bsc.es/viz/greenscent

Crema Groenlàndia: A theater play to communicate the science of climate change

The CREARTE project brought together artists and scientists to develop an interdisciplinary co-creation method for scientific theatre.

We used theater as an outreach medium to explain to a wide audience how science approaches complex problems, with a particular focus on the pressing issue of climate change. At the same time, it showcases the human side of science, while breaking down stereotypes about what it means to be a scientist.

To create the theater play, we applied a new **methodology for co-creating scientific theater** that combined the expertise of climate scientists, social scientists, and artists.

- **Information Gathering**: The artistic team from the Institute of Science and Theater (INCITE) first used ethnographic methods to study the Earth Sciences Department at the Barcelona Supercomputing Center.
- **Theme definition**: Researchers and artists met to define the theme and objectives of the play.
- **Script writing and review**: The artists wrote a script dramatizing scientific discourse, which the scientists later reviewed to ensure accuracy.
- **Public evaluation**: The play was performed for a divenrse audience, who completed surveys before and after the show to assess its impact. Adjustments were made before the official premiere.

Post-performance debate with the public

bit.ly/CremaTrailer

The final play that focused on ocean research, particularly on global ocean circulation and its role in regulating the Earth's climate.

Learning the science of climate change through data comics

The RESCUE project used visual narrative to foster climate awareness among younger audiences

This visual narrative approach has proven to be both accessible and engaging for younger readers.

Sequential panels guide readers step by step, gradually introducing complex concepts through a structured visual narrative. In addition, the use of characters, storytelling, metaphors, and humor stimulates positive emotions, supporting motivation and engagement.

To guarantee accuracy, climate researchers reviewed the comic at different stages of its development to confirm that the content was clear and the visuals effectively complemented the text.

The final product is a four-page comic presenting five key concepts: **the 1.5°C target, tipping points, temperature overshoot, net-negative emissions, and Carbon Dioxide Removal (CDR).** Its format allows easy reproduction, distribution, and translation into multiple languages Additionally, character designs were intentionally created to be gender-neutral to avoid the perpetuation of stereotypes.

Take one!

bit.ly/RESCUEcomic

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