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GioGas: Edutainment and Gas Hazards

Francesca Cirillo¹, Gala Avvisati¹, Maria Luisa Carapezza², Giuliana D'Addezio², Enrica Marotta¹, Rosario Peluso¹, Antonio Scelzo³, Alessandra Sciarra², and Luca Tarchini¹

¹Istituto Nazionale di Geofisica e Vulcanologia, Sezione Napoli - Osservatorio Vesuviano, Italy

²Istituto Nazionale di Geofisica e Vulcanologia, Sezione Roma 1, Italy

³Università degli Studi di Salerno, Italy

The Istituto Nazionale di Geofisica e Vulcanologia (INGV) has developed an interactive application, for educational purposes, in order to make schools aware of the dangers deriving from radon, and in general from harmful gases (gas hazards), near volcanic areas.

To raise children awareness on the dangers related to an invisible enemy, often odorless “gases”, is not a simple task. Since our target are children between 11 and 13 years of age, we decided to develop a videogame with the scope of enabling them to learn the most appropriate solutions for identifying/avoiding/managing hazards. The use of a videogame for spreading information on gas hazards makes learning fun and, at the same time, feasible in a historic moment where Covid-19 does not allow for lessons to be physically partaken in a classroom. Furthermore, this type of learning known as “edutainment” is more effective, captivating and meaningful, allowing students to acquire a more concrete and longer remembered knowledge.

The videogame, called GioGas, is a single player game running on both Android mobile phone and personal computers. GioGas has been developed using the Role Playing Game Maker MV graphic engine. The engine provides a map editor and several characters allowing for the creation of various biomes, also including the possibility to insert music. From the technical point of view the engine is based on javascript for the events creation and triggers management simplifying porting on mobile and desktop operating systems.

The game characters are a INGV researcher, staying in a rented house during his vacation, and an elderly lady that asks for help to understand if her grandchild's health issues are related to the recent digging of a well nearby the house. The characters move around in the virtual environment in different locations organized in several levels. Through the game, the student will learn the symptoms caused by gases, the instruments and the techniques to identify/measure them and the solutions to adopt to solve the problem. During the game, the researcher will hand out information and the student will choose which solution to apply: this will also stimulate student inclination to problem solving and overview capacities. Each solution will return a result in terms of risk mitigation and a score, from 1 to 3, based on the effectiveness of the identified solution.

In the future, to add more stimulating and engaging elements for the student, a multiplayer mode will be developed, giving the students the possibility to challenge themselves.

