The 3DTeLC European project: a new approach to Teaching, Learning and Communicating the science of geohazards in terrestrial and marine environments

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3DTeLC is a three-year trans-European project funded by the Erasmus+ Key Action 2 programme: “Cooperation for Innovation and Exchange of Good Practices, a European scheme that fosters higher education partnerships” (https://www.erasmusplus.org.uk/key-action-2).

The team of the 3DTeLC project held its third summer school from 5 to 14 May 2019. The school was hosted at the department of Istituto Nazionale di Geofisica e Vulcanologia - Osservatorio Etneo (INGV-OE) in Nicolosi, nearby Mount Etna volcano (Italy). (http://www.ct.ingv.it/en/who-we-are.html).

The main goal of 3DTeLC schools is to help young students to become highly-skilled professionals in the field of environment and geosciences, gaining knowledge in image and 3D-spatial analysis, data management and informatics, and strengthening their mathematical and numerical skills in Earth observation and data analysis.

The school was attended by 20 students coming from four different European universities in UK, France, Greece, and Italy. The attendees had nine days of full activity: classes, fieldwork, and practical exercises. In accordance with the project goals, the students learned to develop 3D- and Virtual Reality (VR) products to manage natural risks, with particular focus on the volcanic environment.

Also, they tested a series of freely available toolkits for VR developed inside the project. Teaching materials and datasets allowed the students to navigate different volcanoes (e.g., Santorini, Greece; Etna, Italy) both on the ground surface and seabed using VR headsets, simulating real-field mapping activities.

Indoor classes dealt with topics concerning natural risk management in a volcanic environment, encompassing innovative techniques, such as drones, for the survey of eruptive activity and landslide prone areas (more details at http://3dtelc.lmv.uca.fr). Also, students
had the opportunity to gain outdoor practical experience throughout fieldwork on Mt. Etna, with first-hand observations from the old magmatism of Acicastello (see Figure 1) and Acitrezza to the recent lava flows poured out inside the Valle del Bove in 2018. Part of fieldwork was devoted to the survey of the Fiandaca Fault (Figure 2), which caused a Mw 4.9 earthquake on 26 December 2018, in the southwest part of Etna. Here a visit to the village of Fleri highlighted structural and non-structural damage due to this earthquake.

Students also visited the INGV-OE headquarters in Catania, where they learned about the functioning of cutting-edge equipment, such as thermal cameras for volcano monitoring (see Figure 3). The visit encompassed a guided tour of the Control Room, an example of multidisciplinary best practices on surveillance activities. Sicilian active volcanoes (Etna, Stromboli) are indeed natural laboratories where it is possible to carry out the state-of-the-art scientific and technological researches.

The school had EPOS endorsement for the 3DTeLC engagement in the reduction of natural risks by means the innovative preparation of new professionals inside the Earth Science community.