

An Arduino Seismograph to Raise Awareness of Earthquake Hazard at School

Angela Saraò (1), Marco Clocchiatti (2), Carla Barnaba (1), and David Zuliani (1)

(1) OGS, Centro Ricerche Sismologiche, Trieste and Udine, Italy (asarao@inogs.it), (2) Istituto Statale di Istruzione Superiore “Paschini”, Tolmezzo (Udine), Italy

Involving students in earthquake science through hands-on learning is valuable in raising awareness of seismic hazard and risk mitigation. As an example of how seismic-risk education can be introduced into the topics covered in physics, computer sciences, and technology courses, we share our experience with a group of students attending the high school Liceo Paschini, which is located in Tolmezzo a small town of northeast Italy that experienced the devastating 1976 Friuli earthquake.

The students under the supervision of their physics teacher and seismologists used an Arduino board, ADXL345 accelerometers, and open-source software to create a low-cost seismometer able to record local strong motion. A complete guide to allow other students to repeat the experiment has been recently published (Saraò et al, 2016, *Seism. Res. Lett.* 87, 186-192. doi:10.1785/0220150091).

The obtained seismograph can be employed for lab and demo activity at schools but several additional improvements are needed to use the instrument for monitoring or research purposes. However, we believe that the Arduino seismograph is an excellent example of an educational outcome that is not an end in itself. In the process of completing the task, the students gained a number of educational skills, through lectures covering technical and scientific subjects and through experiential learning. Certain introductory lessons in computer sciences and electronics were required for the students to acquire the necessary skills and to fill gaps in their background knowledge. In addition, lectures by seismologists and specific laboratory activities allowed the class to explore different aspects of the physics of earthquakes, particularly of the seismic waves, and to become familiar with seismic-hazard topics through inquiry-based learning. The project received special mention in the 2016 Science Festival Under 18, held in Monfalcone (Gorizia) and the students were invited to exhibit their seismograph just during the days of the 40 years anniversary of the Friuli earthquake.