



An Arduino project to record ground motion and to learn on earthquake hazard at high school

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Through a multidisciplinary work that integrates Technology education with Earth Sciences, we implemented an educational program to raise the students' awareness of seismic hazard and to disseminate good practices of earthquake safety. Using free software and low-cost open hardware, the students of a senior class of the high school Liceo Paschini in Tolmezzo (NE Italy) implemented a seismograph using the Arduino open-source electronics platform and the ADXL345 sensors to emulate a low cost seismometer (e.g. O-NAVI sensor of the Quake-Catcher Network, <http://qcn.stanford.edu>). To accomplish their task the students were addressed to use the web resources for technical support and troubleshooting. Shell scripts, running on local computers under Linux OS, controlled the process of recording and display data.

The main part of the experiment was documented using the DokuWiki style. Some propaedeutic lessons in computer sciences and electronics were needed to build up the necessary skills of the students and to fill in the gap of their background knowledge. In addition lectures by seismologists and laboratory activity allowed the class to exploit different aspects of the physics of the earthquake and particularly of the seismic waves, and to become familiar with the topics of seismic hazard through an inquiry-based learning. The Arduino seismograph achieved can be used for educational purposes and it can display tremors on the local network of the school. For sure it can record the ground motion due to a seismic event that can occur in the area, but further improvements are necessary for a quantitative analysis of the recorded signals.