

"Earth, from inside and outside - school activities based on seismology and astronomy"

Radu Chivarean

Scoala Gimnaziala Ghimbav, Romania (chivarean@yahoo.com)

Title: "Earth, from inside and outside - school activities based on seismology and astronomy"

Author: Chivarean Radu

Affiliation: Scoala Gimnaziala Ghimbav, str. Pietii, Nr. 70, Ghimbav – 507075, chivarean@yahoo.com

Through a multidisciplinary work that integrates Geography education with the other Earth Sciences, we developed an educational project to raise the students' awareness of seismic hazard and to disseminate good practices of earthquake safety.

The Romanian Educational Seismic Network (ROEDUSEIS) project (started in 2012) is developed and implemented in partnership with schools from different Romanian cities, our school being one of these. In each participating school a SEP educational seismometer is installed. It is the first educational initiative in Romania in the field of seismology involving the National Institute for Earth Physics - NIEP as coordinator.

The e-learning platform website (<http://www.roeduseis.ro>) represents a great opportunity for students to use real advanced research instruments and scientific data analysis tools in their everyday school activities and a link to observations of Earth phenomena and Earth science in general.

The most important educational objectives are related to: preparing comprehensive educational materials as resources for training students and teachers in the analysis and interpretation of seismological data, experimentation of new technologies in projecting and implementing new didactic activities, professional development and support for teachers and development of science curriculum module. The scientific objective is to introduce in schools the use of scientific instruments like seismometer and experimental methods (seismic data analysis).

The educational materials entitled "Earthquakes and their effects" is organized in a guide for teachers accompanied by a booklet for students. The structure of the educational material is divided in theoretical chapters followed by sections with activities and experiments adapted to the level of understanding particular to our students.

The ROEDUSEIS e-platform should be considered as a modern method for teaching and learning that integrates and completes the work in classroom. The project promotes and fosters the concepts "inquiry based science" and "learning by doing". The students are encouraged to "manipulate" easily accessible things around them in order to understand the earthquake phenomenon and earthquake effects on natural and built environments, as well as to "handle" scientific instruments, such as seismographs.

Using the knowledge acquired during the compulsory curriculum and complementary activities we considered that there's nothing better than outdoor education to establish a relationship between the theory and the landscape reality in the field. As a follow up to our theoretical approach for the Earth's crust we organized two study trips. The first one was at the Seismological Observatory at Cheia – Red Mountain, close to the most active seismic region of Romania. Related to the magmatism and volcanism of the geological past of our region, during the second trip the students could admire the basalt columns from Racos and climb the Harghita Mt. to see the crater lake St. Anna.

Expanding the study to the Solar System, our students were determined to find answers to questions such as:

- Are there earthquakes on other planets? What about volcanoes?
- Are rocks on Earth different from those on space?
- What built the landscape on other planets?

We managed to find answers with the help of new technologies...