



Using paired teaching for earthquake education in schools

Solmaz Mohadjer (1), Sebastian Mutz (1), Ruth Amey (4), Reinhard Drews (1), Matthew Kemp (2), Peter Kloos (3), Lewis Mitchell (4), Matthias Nettesheim (1), Sophie Gill (5), Jessica Starke (1), and Todd A. Ehlers (1)

(1) Department of Geosciences, University of Tübingen, Germany (solmaz.mohadjer@uni-tuebingen.de), (2) Department of Earth Sciences, University of Cambridge, United Kingdom, (3) ParsQuake Project, Tübingen, Germany, (4) School of Earth and Environment, University of Leeds, United Kingdom, (5) Department of Earth Sciences, University of Oxford, United Kingdom

Disaster education plays a key role in reducing vulnerability and increasing safety and community resilience to disaster risks. Geoscientists can inform mitigation and resilience strategies as they collect and analyze data relevant to disaster risks. However, many of the approaches they use to engage with the public involve one-way, asymmetric communication, meaning information is delivered but not exchanged (e.g., talking to the media, writing books, producing informational videos, and giving lectures). In school settings, geoscientists often engage in one-way communication by following the traditional lecturing format to communicate with students, giving few opportunities for interactions and feedback. Though this approach can be effective in communicating some factual information, it ignores the important role of the students and teachers in disaster risk reduction, response, and recovery.

To address this issue, we have created 10 learning videos that engage geoscientists, students and teachers in earthquake science, hazards, and safety. The paired teaching technique encourages the in-class teacher to collaborate with the video teacher (a geoscientist) to help students understand the physical processes related to earthquakes (e.g., plate motions and faults) and the self-protective steps they can take to mitigate hazards (e.g., preparing an emergency response plan). Each video is designed to be viewed in short segments. In each segment, the geoscientist asks questions that will be explored through hands-on activities under the guidance of the in-class teacher in between segments.

The first six videos introduce students to fundamental scientific concepts behind earthquakes (e.g., Earth's interior, plate tectonics, properties of Earth's materials, faulting, elastic rebound theory, and seismic energy). These concepts are taught through hands-on learning where students use toys (e.g., silly putty, slinky) and build simple models to visualize what happens inside the Earth and along a fault system when earthquakes happen. The remaining four videos focus on concepts related to earthquake hazards (e.g., landslides, liquefaction, structural and nonstructural hazards) and safety measures (e.g., drills and planning). In these videos, students explore the effects of different hazards by building and testing landslide, liquefaction and structural models on a shake table.

All videos and supporting materials are freely available on the YouTube channel of the European Geoscience Union (<https://www.youtube.com/user/EuroGeosciencesUnion>) and as DVDs upon request.