



My smartphone is now my teaching assistant – problem-based learning in the field

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Second year Utrecht University Earth Science students participate in a two-week field trip in the Tremp region, in Catalonia, Spain. The students study a sedimentary basin that was filled and displaced southward under the influence of the Pyrenean orogeny. The tectonic control on sedimentation is a central theme during the field trip. Over the past decades, field education projects like this Pyrenean project have been confronted by several problems. First of all, class-room courses that used to provide students with the practical skills needed to become relatively independent field learners have been replaced by process-oriented courses or have become elective. Second, teaching assistants (often master's or PhD students) became less experienced in geology in the field and even senior members of the teaching team are not highly experienced field geologists anymore. Third, due to the increasing number of students enrolling in Earth sciences bachelors, student/teacher ratios have increased substantially. These developments require field teaching methods that better suit the current state of our education.

Nowadays, students and teachers have quick and place-independent access to an immense wealth of online information and tools. The aim of our project is to develop an intelligent tutoring system named The Utrecht Companion to the Earth that allows integrated asynchronous online supervision of students' field activities. This system will contain georeferenced cartography, problem-based learning materials (infographics, augmented reality, and knowledge clips) and a social fieldwork component in the form of a chat function. It will initially be used in the Tremp area in the Pyrenees, but it is also intended for other field education projects. Here we present the first concepts and ideas that we will use and evaluate during this year's fieldwork.

The intended outcome of our project is a significant improvement in geological field teaching. We aim for an enriched learning environment in the field, in which students will be able to use digital/online learning materials on their tablets and phones to obtain knowledge and practical skills, and contact-time between instructors and students that can be reserved for teaching focusing on understanding.