



Implementing virtual field trips in the curriculum of geography students

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Current online geospatial databases and tools offer many opportunities in geoscience education. On the one hand a variety of geoscientific topics and regions can be studied without traditional fieldwork, and on the other hand, field-based learning activities can be prepared or post-processed. In this research, the use of Virtual Field Trips (VFTs) in Google EarthTM is studied. In the framework of geomorphology courses, undergraduate geography students were given VFTs as developed by the lecturers or had to develop VFTs themselves, after visiting a study area. Maps, photographs, GPS-tracks, literature and other spatial information were integrated in the VFTs. The effect of VFTs on learning outcomes, on the insight in the horizontal and vertical relationships between the spatially varying topics, and motivation were measured. Results confirm that students are positive about the use of VFTs. They indicate that VFTs significantly improve their mental map of the study area, whereby horizontal relationships were strengthened. Also the additional information in some VFTs proved to have positive effects on studying and structuring the learning content. Students also appreciated to work independently with the VFTs and saw possibilities for integrating various geoscientific topics. However, there are also some constraints in working with VFTs. It was clear from the study that VFTs have to be embedded in the curriculum as students do not use or develop VFTs spontaneously. Indeed, it takes a lot of time to develop a VFT, and students also appreciate a variety in work forms. Also some technical difficulties on sufficient wireless internet access and flexible work spaces have to be encountered. Besides this, curricula developers should be aware that VFTs are an interesting tool additionally to field trips, but that they cannot replace the field trips.