



Virtual tours as a new teaching tool in geoscience: an example from the Western Alps

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Since almost two decades, numerical tools allowed to spread the science to the people at large, worldwide. Within a few minutes, it is now easy to find a detailed course on one technical or scientific topic. A teacher can lead students to online contents (created by his/her own or by others) to complement his/her own course, with videos, maps or any other content that would remain accessible for the students a long time after the course itself. In geosciences, many national and international institutions provide real time monitoring of the Earth (e.g. seismicity, climate, volcanisms...) and / or scientific content based on active research or more mature results. There is little doubt that this new scientific content is a great step forward for the students and the researchers alike.

Geosciences (and especially geology), however, usually require field observations and in situ measurements, and a good student curriculum cannot be achieved without a significant amount of walking, observations, and questions answered on the field. We, as geologists, all experienced days and days of sun, dust and pouring rain... Most of the universities provide the students with field courses that allow them to (try to) apply what they have learnt in the universities' buildings. However, these few days (often reduced to cut the costs and fit teachers' schedules) may not be sufficient given the complexity of the area visited and the possible lack of some parts of the teacher's explanations for various reasons. It is therefore important to build a virtual suite to the field itself to provide a cost-free support available year round, to eventually achieve or complete the field course. The new images technologies now offer amazing visualization capabilities to "show" the field in an interactive fashion. For instance, a few tens of pictures taken with a good SRL camera equipped with an ultra wide angle lens permit to build a 360° panorama with no deformation of a point of interest. Moreover, these panorama can be linked together to travel from place to place. Last, but not least, the display of any type of information (video of the last year teachers' explanation, close up of a structure, graphic plot, text content, interpreted geological sections etc.) can be integrated in the virtual tour. From this, it is easy to build a full educational virtual tour that can include the information provided in the field book, and even become the field book itself. These virtual tours can be used with any device (laptop, tablet, smartphone...), hence have the potential become key players in field teaching. Finally, these virtual tours can help physically impaired students to complete their geological curriculum with the indispensable field experience they would not have had otherwise.

Here we present an example of such a virtual tour build in 2012 across the European Alps during the 1st International Field Course organized by Grenoble University, ETH Zürich and Milano University. This virtual tour covers the Grimsel Pass Aar Massif Hercynian Basement (granite, shear zone and the underground NAGRA test site), the Zermatt area (two continents and two oceans packed together), the Aiguille du Midi incredible overview on most of the W-Alps, and the back limb of the Nappe de Morcles and its relation with the surrounding blocks.

Link to the virtual tour: <http://www.alpesphoto.com/temp/visites/Suisse/build/virtualtour.swf>