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Learning landslide hazard in a virtual environment at University level combining real case study, collaborative work and innovative tools

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The pandemic situation we are experiencing has forced us to transform face-to-face teaching into virtual teaching. Digital platforms hinder the interaction, discussion and feedback that naturally occur in a face-to-face class, but at the same time, they provide an opportunity to put the focus on the student's learning rather than on content delivering. Learning include both, inductive and deductive processes; induction can be effectively acquired by using case studies; then, deduction can be achieved through comparison, analysis, generalisation and synthesis. Digital platforms appear as an optimal resource to facilitate the individual and collaborative tasks and learning processes. In this work we present our experience on the landslide hazard subject (Master's level) focussed on the student's learning through the use of digital media.

Internet information of undeniable quality that can be easily accessed is basic: The Landslide Blog by Dave Petley (<https://blogs.agu.org/landslideblog/>) in Blogosphere hosted by AGU (American Geophysical Union) provides valuable and updated information on landslide events occurring worldwide. The learning activities are structured around several cases selected by the lecturer from the blog to ensure the analysis of the most frequent landslide types. All activities are developed in 8 steps: 1) The teacher presents the learning action (objective, tasks, and assessment guide) using a Genially platform interactive image; 2) Each student selects one of the proposed cases and compile relevant information about it; 3) Each student analyses the landslide characteristics, identifies the landslide type and classifies it according to Hungr et al., 2014 (available through the educational virtual platform), and recognises the control and triggering factors (one virtual session is programmed and a forum tool is provided to the students to discuss and to solve doubts); 4) Each student selects and organizes the significant information about each case by building an interactive image in Genially; 5) Each student presents each case using his/her interactive image in a virtual session, which is recorded and uploaded to the educational platform; 6) Students peer evaluate the content and design of the interactive images and oral presentations based on the provided assessment guide; 7) During a predetermined time, students collaboratively compile all the information in a Google sheet table to synthesize the geomorphological characteristics, materials involved, mobilization mechanisms and control and triggering factors of the different types of landslides; 8) the synthetic table is discussed and completed during a virtual session.

All the knowledge and skills acquired by students with these activities are put into practice in a two-day field trip where students have to identify, characterize and classify different types of landslides as well as their control and triggering factors. The risk situation and the mitigation strategies are discussed in each case and compared to the ones studied through virtual learning. Furthermore, students get used and learn how to clearly present information through virtual tools, as Genially, useful for dissemination purposes.

Hungr et al. 2014. The Varnes classification of landslide types, an update. *Landslides* 11(2). DOI: 10.1007/s10346-013-0436-y