Geophysical Research Abstracts
Vol. 21, EGU2019-11596-1, 2019
EGU General Assembly 2019

Role-playing in teaching tectonic geomorphology? A debate-session on open ended scientific questions

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The curriculum of the master's program (MSc) in Geophysics at ELTE Eötvös Loránd University contains a mandatory course on *Tectonic geomorphology* since its inception. This course is intended to bring the knowledge of students (often with backgrounds from different bachelor's programs) to the same level on a wide range of topics.

The structure of the course follows the classic bimodal teaching method: it contains a core part, presented by the teaching staff and a seminar-like part, during which the students present and discuss various papers (of various quality) selected from a list. One of the aims of this approach was to help students develop their soft skills, however some more reclusive students were hard to motivate.

To improve on this aspect, we introduced a standalone debate session (ca. 90 min). This year, the topic of the debate had been the expansion of the Paks Nuclear Power Plant. In this debate, the students were randomly assigned to different stakeholders with different motivations.
Three weeks before the assignment of roles, the students were given an extensive list of (a) scientific papers, (b) official communications (of state authorities, NGOs, etc.), (c) publicly available official plans and (d) newspaper articles.

Two weeks before the session, two-person groups have been randomly formed and their roles were assigned. The stakeholders included the investor (the state-owned electricity company), the (foreign) contractor building the power plant, the national geological/mining authority (responsible for issuing permits if the site was deemed appropriate), the foreign ministry/embassy of a neighboring country opposing the proposed project, and a fictitious society of professors (who would be largely neutral, but criticizing anything that is scientifically unsound). The groups had to communicate (and defend) the viewpoint of the stakeholder they played, irrespective of their personal opinions.

The session was a stunning success. The groups were very well prepared. They presented their initial statements at the beginning and then they debated seeking supportive opinions from other stakeholders and vividly engaging others who questioned their position. Some groups even tried to mimic the behavior (e.g. dress-code, use of language) of the stakeholder they represented.

After the session the students were interviewed about the session. The vast majority reported that although it was difficult to represent an opinion that they personally not shared, they learned a lot. Another common opinion was that it was useful, that they were forced to read all types of contributions (as initially they did not know what would be their task), so they learned more than otherwise they would.

It is important to note that all students took part in the discussion almost equally, without too much intervention from the teaching staff who were there in a moderating capacity. We conclude that this role-play debate contributed to foster their extracurricular skills like critical thinking, working in teams and the ability to solve problems.