

"Floodopoly": an innovative and interactive approach for research led educating and outreach activities in geosciences and ecohydraulic engineering

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This study assesses the efficiency of a model city in a sand-box placed inside a demonstration flume at the Water Engineering lab of the University of Glasgow, namely "Floodopoly", an innovative, immersive and interactive education, outreach and awareness approach, on: a) engaging high school pupils with STEM topics, particularly engineering, b) showcasing with ease novel conceptual engineering designs, specifically against flooding, and c) drawing the interest of undergraduate engineering students and facilitating the explanation of flooding and associated geomorphic processes, which are intensified under climate change scenarios. The activity, as the name implies, revolves about a model city (with 3D printed buildings), which is crossed by a river. As the students place more buildings in the city (scenarios of "urbanization"), these become increasingly susceptible to flooding, under a "climate change" scenario (at the end of each turn). The focus of the activity is to present the detrimental impacts of flooding, for both the natural and build environment alike, and raise awareness by personalizing the impacts of flooding.

Overall the activity has been presented to thousands of individuals, including: a) engineering students (e.g. in School's Open days and the cohorts of the 3rd and 4th year Civil Engineering Department attending Engineering Hydraulics classes and relevant Design projects), b) high school pupils (e.g. in Widening Participation events and the Glasgow Science Festival), and c) students of all ages (from 6-12 years old, at the Glasgow Science Museum). It continues being well received (see <https://twitter.com/WaterEngLab/status/758270564561784832> on Twitter and <https://youtu.be/H5oThT6QaTc> on Youtube), at a number of venues, for a sixth year, expanding the success of previous activities (Valyrakis and Cheng 2017).

It has been commented as "an excellent example of research led teaching" (from the Head of Discipline at the UoG) and students expressed their interest and the need for this project in improving their understanding of underlying processes. Floodopolis, is considered to be an excellent resource to encourage identifying innovative ways to link impactful research with societal awareness and conduct creative demonstrations that educate and have the potential to benefit society by increasing its resilience and attracting more students to STEM.

References

Valyrakis M. and M. Cheng (2017), Raising awareness of the importance of engineering protections against floods with "Flood-o-poly" v.2, EGU General Assembly 2017, Vienna, Austria, 23-28 April 2017, id. 4193.