

Enhancing learning in geosciences and water engineering via lab activities

Manousos Valyrakis (1) and Ming Cheng (2)

(1) University of Glasgow, Infrastructure and Environment Research Division, Civil and Environmental Engineering, Glasgow, United Kingdom (manousos.valyrakis@glasgow.ac.uk), (2) University of Wolverhampton

This study focuses on the utilisation of lab based activities to enhance the learning experience of engineering students studying Water Engineering and Geosciences.

In particular, the use of modern highly visual and tangible presentation techniques within an appropriate laboratory based space are used to introduce undergraduate students to advanced engineering concepts. A specific lab activity, namely "Flood-City", is presented as a case study to enhance the active engagement rate, improve the learning experience of the students and better achieve the intended learning objectives of the course within a broad context of the engineering and geosciences curriculum. Such activities, have been used over the last few years from the Water Engineering group @ Glasgow, with success for outreach purposes (e.g. Glasgow Science Festival and demos at the Glasgow Science Centre and Kelvingrove museum). The activity involves a specific setup of the demonstration flume in a sand-box configuration, with elements and activities designed so as to gamely the overall learning activity. Social media platforms can also be used effectively to the same goals, particularly in cases were the students already engage in these online media.

To assess the effectiveness of this activity a purpose designed questionnaire is offered to the students. Specifically, the questionnaire covers several aspects that may affect student learning, performance and satisfaction, such as students' motivation, factors to effective learning (also assessed by follow-up quizzes), and methods of communication and assessment. The results, analysed to assess the effectiveness of the learning activity as the students perceive it, offer a promising potential for the use of such activities in outreach and learning.