Innovations in large group teaching: Challenges and opportunities

Corina Sas

School of Computing and Communications, Lancaster, UK

My teaching has been improved through an ongoing reflective and innovative approach to my practice [7],[8],[9],[10]. In this paper I reflect on my experience of teaching Discrete Mathematics to large groups of first year students in Computer Science. This is a challenging topic to teach, given that A level Mathematics is not an entry requirement for students in our Computer Science courses. In particular, I describe two teaching innovations that I have employed over the last two academic years. The first is at conceptual level: explaining mathematical concepts in intuitive and easy to understand ways. For this, I have employed novel metaphors inspired from embodied cognition theory [2],[4],[5] which argues that abstract concepts such as those in mathematics [6] are developed from the sensorial experience of understanding the world as an infant. The second innovation is at delivery level to encourage active participation. For this, I used a game-based learning platform for brief in-class exercises that each student can complete through their personal laptop or phone via a web browser. Such innovation integrates private and public displays, a growing research area in HCI [1],[3]. Students' feedback has been excellent: in both years, in my last session, I received spontaneous applauses from the whole of the class. I will conclude with a reflection on the value of these innovations for students' learning and engagement, and on their broader benefits for large group teaching.

References

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