Using an Electronic Voting Systems and ResponseWare to Improve Student Learning and Enhance the Learning Experience

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In any learning environment that guides students to take control of their own learning, motivation and feedback play crucial roles. Without feedback (and feed-forward), students will not be able to fully evaluate their performance, making it more difficult if not impossible for them to reflect upon learning or take action to improve it. A successful learning environment is one that provides both encouragement and motivation complemented with formative feedforward and feedback assessment strategies that enable the students to reflect upon, monitor and take responsibility for their own learning.

Electronic Voting Systems (EVS) are increasingly being adopted in learning and teaching strategies with a view to facilitating the students' active engagement in their learning. Such systems also provide the lecturer with a means through which students can be given instant anonymised feedback within a classroom context. Students are given a device, often called a 'clicker', with a number of buttons and are asked a series of multiple-choice questions. For each question, the students select an answer and press the associated button on the 'clicker'. The system collects all the student responses which can in turn be displayed to the class and the results can be analyzed. A student can ascertain the holistic response of the class to each question but no student can identify the response given by another student. Consequently, in a safe and anonymised environment, a student not only receives feedback on where he/she is in engaging with the material, he/she can also benchmark their performance against the class cohort. A significant body of literature is present detailing the benefits of these systems to student's learning and learning experience (Crouch & Mazur 2001, Russell 2008, Draper 2009).

This paper draws upon our experience gained in the use of such systems within the Department of Computer Science. Initially, EVS systems were used to promote student engagement with the taught material and we developed revision exercises as a way of providing interactive formative feedback beyond the simply factual (Davenport, Hayes & Parmar 2009). We did so with a view to providing instant formative feedback, facilitating peer interaction, enhancing student motivation and triggering deep learning. We have extended this and now also use it to deliver summative assessment (of EVS questions the students themselves set). We hold an EVS session, post the submission, as a means of providing students feedback from their peers on the questions that they submitted. We also use this session to obtain feedback to us from students who have studied the unit. This paper reports upon an extension to our current use of EVS systems through the integration and use of ResponseWare. We report upon how we have adapted the free-text response capabilities that ResponseWare delivers in order to enhance
the formative feedback delivered to students. In particular, we describe how we have asked students to supply code snippets via the free-form text facility and how we provide feedback to students on this. We also describe how we have used this technology to develop an anonymous approach to agile coding dojos (a flexible mechanism to engage a large group in to writing a piece of software interactively - Sato et al 2008) and report upon an analysis of an evaluation questionnaire that has been used to determine the students' voice in the effectiveness of this development.

References