Review for Session Topic: In-class vs out-of-class work by students

Commentary on:

Bali & Keaney "Collaborative Assessment Using Clickers"

Sharp & Sutherland "Learning Gains… 'My (ARS)' The impact of student empowerment using Audience Response Systems Technology on Knowledge Construction, Student Engagement and Assessment"

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(Both the papers in this session report on using Electronic Voting Systems (EVS). I'll use "EVS" to refer to this, though Bali & Keaney call them "clickers", while Sharp & Sutherland use ARS (Audience Response Systems). I will also use "MCQ" to refer to the Multiple Choice Question format that EVS requires.)

The first feature of the Bali & Keaney study I want to discuss is student engagement. This is the clearest conclusion that we can draw: that students did engage, and wanted to engage. It thus relates to the Gibbs principle of "Capture sufficient study time and effort (in and out of class)" (http://www.psy.gla.ac.uk/~steve/rap/gibbs.html). Since this took place in a class they would attend anyway, it is not inherently a clear gain for the amount of student "time on task". However if it were to become a regular feature, then it might elicit extra or more focussed preparation time.

A sign supporting this interpretation is that the students themselves demanded feedback on what the right answers were. Supplying this means that each question supplies the "metacognitive" information to each student on whether they need to work more on that topic, or seem to understand it adequately. In this respect it has some similarities to the Gardner-Medwin technique of confidence-based marking, which provokes individuals to pay attention not to guessing answers as well as they can, but to whether they understand each topic well enough to feel confidence in their answers. Metacognition has often been shown to lead to raised learning outcomes.

The most distinctive feature of the Bali & Keaney study however is the particular mix of solo and group work it designs in. One aspect, obviously, is using familiar team competition both to motivate individual performance (I musn't let my team down) and to foster group mutual supportiveness. By requiring individual answers first, they ensure everyone thinks about the question themselves rather than waiting for someone else: a crucial advantage of such EVS use over asking oral questions in class where most students wait to see what others will say. However it is not clear that the 60 seconds conferring before the second vote really supports learning as well as, say, the Mazur method for EVS use. If you want your team to win, you will listen for the most confident suggestion, but will not have time to ask for reasons or correct your understanding. It may be more like organised plagiarism than conceptual development. Most groups outside education are organised around specialisation: each member primarily does their job, and does not try to learn others' jobs but simply coordinates their actions with others. In learning, in contrast, a different kind of cooperation is required, that will eventually leave every member equally knowledgeable. This classroom setup may not be designed to achieve this, and the data on their second

votes does not necessarily, or even probably, reflect their knowledge still less their understanding (ability to justify their vote).

The Sharp & Sutherland study demonstrates many nice features of a good learning design, particularly in the way things are woven together. Thus while the students are eventually required to design EVS questions and use them in presentations, they are exposed to them as users i.e. respondents in every class. Similarly, having to make presentations to the rest of the class both develops their "graduate skill" of presenting, but also requires them to master the course material on the topic they present on.

However to me the unique contribution of this case, relative to the existing EVS literature, is firstly the idea of moving EVS question design from teacher to students, but most of all that they report that this provoked deep discussion between students out of class. By far the majority of EVS use is, like the Bali & Keaney study, about raising student engagement in class. In the case of Mazur and those who adopt his methods, it can also greatly raise levels of deep comprehension. Yet none of this addresses the great issue particularly in first year, of promoting regular and productive work out of class: Gibbs' full principle. Since most student work at university is out of class, this is actually more important. While there are probably significant carry-over effects in many cases from in class to out of class, for instance via "metacognitive" awareness of the specific things a student does not understand and should work on, Sharp & Sutherland are reporting a more direct effect of EVS use on securing out of class deep learning and productive but unsupervised groupwork.

DISCUSSION ISSUES

1. How much does in class / out of class matter?

2. What other techniques do this well? E.g. Just In Time teaching.

3. Is my suggestion that the wrong kind (for learning) of collaboration could be going on in the Bali & Keaney case worth taking seriously, or probably misguided?