Re-engineering the value proposition for class attendance in the digital age

Alva L. Couch, Associate Professor of Computer Science, Tufts University

Suggested session: Engineering Education in the Digital Age

We utilize a novel interactive class format to increase the value proposition for attending class, while at the same time using digital tools to streamline use of class time and increase social immediacy of class materials. A class consists of a 45-minute lecture followed by a 30-minute problem-solving session in which students work in small groups to solve problems on a paper worksheet based upon the current lecture. Grading results are returned online by scanning each graded worksheet into a document repository that students can access. This reduces class time spent "giving back assignments" and allows a single sheet of paper to be "handed back" to a potentially large group of students who had a part in creating it. Social immediacy is maintained by announcing the availability of each batch of grading results on the class's Twitter channel!

The social effects of this format are profound; class attendance, attention, enthusiasm, and spirit have all dramatically increased as a result. The "small group" format allows weaker and less outgoing students to "go along for the ride" in a group, but also exposes them to proper thinking, approach, and peer guidance. For an instructor, the group work session provides an opportunity to observe and assess the effectiveness of the lecture, the students' general understanding, student attitudes, and issues that might be interfering with student performance. For an instructor, the task of creating an exercise based upon the current lecture helps one choose and refine clear objectives for the lecture itself, and keeps students informed of those clear objectives.

We will show how to implement this format, with examples and guidelines, and demonstrate how the format increases both student performance and teaching effectiveness while actually reducing the effort required to teach the course.

NOTES:

- Exercises reinforce ideas, and do not assess proficiency.
    - Tightly couple lectures and exercises.
    - Stand ready with hints to help students succeed!
    - Do not let students fail!
    - Do class-wide announcements for shared troubles.
    - Credit is for participation, not for performance.
    - Cannot "make up" a classroom session.
- Avoid economic barriers such as use of electronics in class
    - Use paper to submit answers.
    - Go paperless after the class session.
    - Use digital means to grade, file, and return work.
- Value students' classroom time.
    - Use social internet channels for announcements.

- Match exercises to study targets for exams.
- “Hand back” work and solutions over the internet to save class time.