

Collaborative group projects in Natural Disasters

Natural Disasters (ATOC 185 / EPSC 185) has been taught by Profs. John Gyakum and John Stix since 2000. Initial enrolment was ~50 students, and current enrolment is ~620. The lectures are given in Leacock 132.

In 2014 we offered the course as a MOOC, entirely online and at no cost, through edX. Enrolment was ~10,000 students.

Since 2014, we have used two online modules from the MOOC in our McGill course. The students observe the lectures from their computers, and we have built two collaborative group projects to accompany these online modules. The use of these modules frees six lecture periods for students to present their projects.

On the following pages, we describe the details of these projects and how we do them in a large classroom setting.

Preparation Phase

After the add-drop period has ended, we divide the students alphabetically into 104 groups of 6 students each. The groups, their assignment, and the online lecture are posted to MyCourses. They have 3-4 weeks to complete the assignment.

The students in a group make contact with each other. They divide the workload among the members and then work on the assignment.

One project examines tsunamis. Here the students analyze two videos of experimental tsunami waves. They then compare these experimental waves to a real-life wave, and for this, they choose and analyze a good example from Youtube. They also complete a homework assignment with specific questions about tsunamis.

The other project examines tornadoes. The students are asked to analyze laboratory-based tornado rotation mechanisms, and to develop an additional lab experiment to demonstrate rotation. They are also given a “tornado chasing” exercise and asked to design a strategy for driving from a location in southern Kansas to view a tornado on a particular day. The students are provided with an extensive range of meteorological data to use in their analysis. They also complete a homework assignment with specific questions about tornadoes.

Presentation Phase

Once the students have completed their assignment, they present it to their peers.

Each group prepares a conference-style poster with powerpoint or similar software, prints it out at CopiesEUS (the Engineering copy centre in McConnell) for about \$35 and splits the cost amongst the six members of the team.

You can see two examples of posters displayed on the wall...very professional !

The group then presents their poster in class. We use the three lecture periods normally devoted to the topic (4.5 hours total) for the group presentations instead.

For each 1.5 hour class period, ~34 groups are presenting, 17 during the first 45 minutes and another 17 during the last 45 minutes.

At any one time, therefore, 17 groups (~102 students) are arranged around the edges of Leacock 132 with their respective posters affixed to the walls. This arrangement allows for an uncrowded atmosphere with a low noise level conducive to presentation and discussion.

Two groups are clustered together, along with their TA (we have 17-18 teaching assistants for the course). One group orally presents their poster to the other group and the TA for ~10 minutes, with questions at the end. Then the two groups switch roles. The TA grades each presentation.

Once the two presentations are complete, each student fills out a peer assessment form, in order to identify those students in the group who have done superlative work, or little work, as the case might be.

For each project, the group's grade is based on (a) the oral presentation, (b) the quality of the poster, and (c) the homework assignment.

Something new

This year we have been trying something new. Each TA is responsible for 6 groups (~36 students), and the TA has been acting as a mentor to these groups. The TA provides advice on the projects, and since each student needs to write a term paper for the class, the TA also provides advice for the paper. The TA also grades these 36 term papers. Our hope is that the groups “bond” with their TA during the course of the semester. This strategy provides the students with a mentor, and also provides the TA with an opportunity to become more involved in the instructional process.