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TEACHING & LEARNING SUMMIT 2018

The Design and Implementation of Integrated and Interdisciplinary Information Literacy Instruction

We are developing interdisciplinary active learning lesson plans to teach information literacy in two large required science classes, EUREKA! and PROPEL. Our goal is to use learning gain assessments to systematically assess the effectiveness of different active learning exercises and target areas of weakness with interventions.

Project Design

In 2017, we were invited to teach a one week unit on information literacy in large (180-250 students) MCS classes, EUREKA! and PROPEL. In 2018, we introduced a pre- and post-learning assessment.

Our research question is how much do first-year science students learn from a one-week unit on information literacy?

2018 LESSON PLAN

LECTURE

- 1 hour lecture with 5 interactive Direct Poll questions and 2 think-pair-share exercises

RECITATION

- **"Along the Graphene Trail"** is a 7-step digital scavenger hunt that gives students the opportunity to navigate through several science information resources.
- Recitations were led by teaching faculty. We supplied a lesson plan that included notes on strategy and pain points for each step of the exercise.
- This exercise is easily adaptable for other disciplines

INFO SCAVENGER HUNT at a glance

THE SCENARIO

You are browsing the June 2018 issue of Scientific American online and an article catches your eye "Quirky Graphene" by Prachi Patel.

EXAMPLE STEPS

STEP 1: As you read over the short news article, part of the article discusses electronic ID tags.
Use the clues given in the article to locate the original work that they are describing.

STEP 2: You have found the original article in ACS Nano. What clues do you have that this is a scholarly article?

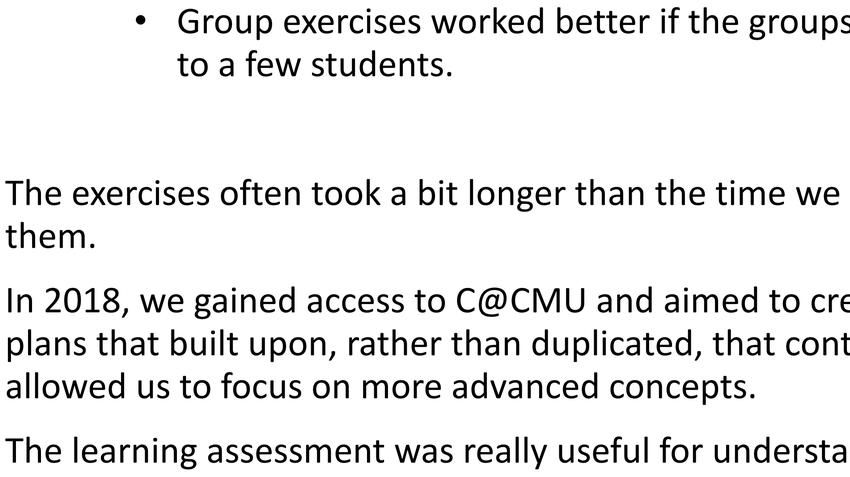
Lessons Learned

- Student engagement is quite variable across active learning exercises and recitation sections.
  - In spite of uneven engagement, 74% of students in 2017 reported in an attitudes post-assessment that they found a role-playing exercise to be useful for learning information literacy concepts.
- Active learning exercises had to be fairly structured to be successful in these large classes.
  - Our implementation of Think-Pair-Share needs to be optimized. Students used the time to chat.
  - Group exercises worked better if the groups were limited to a few students.
- The exercises often took a bit longer than the time we budgeted for them.
- In 2018, we gained access to C@CMU and aimed to create lesson plans that built upon, rather than duplicated, that content. This allowed us to focus on more advanced concepts.
- The learning assessment was really useful for understanding pre-existing knowledge and the effectiveness of our instruction and will guide lesson planning in future semesters.

Project Evaluation

We compared students' knowledge of information literacy concepts before and after a week of instruction in EUREKA! in the fall of 2018.

- The learning gains assessment was administered on Canvas.
- We used counter-balanced design to control for differences in the difficulty of the pre- and post-assessments and order effects.
- Students were assigned version A or B depending on their recitation section and took one version at the beginning of lecture and the other at the end of recitation.
- Students were given immediate feedback on the answers.
- Results showed no significant difference between version A and B.



Students exhibited a significant learning gain from pre-test to post-test, t (181) = 10.71, p <.001, Cohen's d = 1.04. All error bars are 95% confidence intervals on the means.

Carnegie Mellon University Libraries

We thank Ken Hovis for the opportunity to teach in the EUREKA! and PROPEL courses and for conversations about lesson planning.