STEM Teaching Hacks Workshop #2: Assessment & Grading

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Workshop Expectations

- Time
  - pre-class
  - in-class worksheet
  - homework assignment
  - pre-class
  - in-class worksheet
  - clicker questions
  - homework assignment
  - practice questions
  - unit exam

Time
Hack #1 – Bridges to Daily Life

Use social media (or Canvas) ask students to share something from outside world and connect it to specific class content.
Example: Tweet about or post a photo of an area on campus and connect it to class content.

Student Post:
Where: UT campus outside Painter

What: Bushes growing well in part of the garden only

Connection: Lack of photosynthetically active radiation under oak tree reduces growth and survival in the shade
Hack #1 – Bridges to Daily Life Examples

1. Start a classroom or education blog

2. Create a discussion board for students to share articles in the news related to the class

3. Dr. Margaret Rubega from University of Connecticut has students in her ornithology course post pictures of birds as described in this YouTube video

https://www.youtube.com/watch?v=ik0Wa1bWmP4
Hack #2 – Cooperative Assessment

After completing a quiz or exam on their own, students work in a group to discuss, come to consensus, and answer the questions a second time.

http://cwsei.ubc.ca/resources/files/Two-stage_Exams.pdf
Hack #2 – Cooperative Assessment

1. The reference below has a great video showing administration of a two-stage exam for a class of 300 students in 50 minutes!

2. Group Practice Review / Exam – Just in time learning / low-stakes assignment before individual midterm exam to give students formative feedback ahead of exam.

http://blogs.ubc.ca/wpvc/two-stage-exams/
Hack #3 – Open-Ended to Multiple Choice Questions

To design great multiple choice questions...

1) Ask an open-ended question to one class

2) Take common misconceptions and use them to create distractors for a multiple-choice version of that question for a future class

https://testing.byu.edu/handbooks/betteritems.pdf
Methicillin-resistant Staphylococcus aureus (MRSA) is a type of bacteria that is resistant to many common antibiotics. Infections caused by resistant bacteria are not cleared by treatment with antibiotics. Most MRSA infections arise in hospitals, but can also occur in crowded community settings. How did antibiotic resistance first arise in MRSA bacteria?
Hack #3 – Students’ answers to open-ended question

• Lots of people in hospitals are sick and are treated with antibiotics. The **bacteria need to be resistant** to antibiotics so they can survive.

• The antibiotics **made mutations happen** in the bacteria when given to people in hospitals.

• Chance mutations make some bacteria more resistant than others. The more resistant ones survive and reproduce.
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A. Resistance occurred because the bacterium needed resistance to be able to survive.

B. Exposure of the bacteria to antibiotics induced mutations that led to increased resistance.

C. When chance mutations led to increased antibiotic resistance, the resistant bacteria survived and reproduced.
Hack #4 – Writing Captions

Give students a graph, figure, or image and ask them to write an accurate, descriptive caption.
Hack #4 – Writing Captions Example

Figure Caption Prompt:
In your own words, write an accurate, and descriptive statement to caption this figure. Make sure your caption is clear, explains all features of the plot, and highlights the meaning or importance of the plot.
Hack #4—Examples

1. Write labels for textbook figures
2. Write caption for primary literature figure

Hartwell, et al. (2015) Genetics: From Genes to Genomes
Hack # 5 Peer Grading

Use Canvas (or other tools) to facilitate peer-review of student work.

- Give students exposure to assessing quality or validating correctness
- Allow revision before instructor grading

http://cwsei.ubc.ca/resources/files/Student-Peer-Review_Intro.pdf

http://cwsei.ubc.ca/resources/files/Student-Peer-Review_Resources.pdf (describes several other tools for peer review)
Hack #5 – Peer Grading Walk-through

1. Go to your Canvas course
2. Create an assignment and enter instructions
3. Select “Online” submission type and select an entry option
4. Select “Require Peer Reviews”
5. Select “Automatically Assign Peer Reviews”, or plan to manually assign reviews
6. Enter the number of reviews per student
7. Enter the date and time the reviews will be assigned
8. Select “Peer Reviews Appear Anonymously” if desired
9. If you include a rubric, students have to complete the rubric for their review.

https://community.canvaslms.com/docs/DOC-10094-415254249
Hack #5 – Peer Grading Examples

1. Active Peer Review Sessions – Instructor / TA poses questions during a review session and students work on them in groups. Students share solutions with the whole group and discuss differences.

2. Posters & Gallery Walk – Groups prepare poster presentations. Group members take turns presenting and giving feedback to other groups during a Gallery Walk.

3. Grading rubrics – Use simplified “1st draft’ rubric to guide revisions, and ‘final draft’ rubric to administer final grade
Hack # 6 Video Review of Exam

Instead of spending class time discussing a recently returned exam, create a video of solutions and discussion. Students can watch the video and focus on the problems they missed.
Hack # 6 Video Review of Exam Demonstration

Screen-cast-o-matic

• Free tool for making video of computer screen
Hack # 6 Video Review of Exam Walk-through

1. Go to https://screencast-o-matic.com/
2. Click on “Start Recording” (blue button, middle of screen)
3. Click on “Launch Recorder” (green button, middle of screen)
4. Follow prompts to open recorder
5. Adjust the size of the recording box
6. Open whatever documents you would like to record on
7. Click “Rec” (red circle, lower left)
8. Click “Pause” then “Done” (lower left)
9. Select “Save as Video File”
Assessment & grading resources

• http://www.cwsei.ubc.ca/resources/instructor_guidance.htm
  - Several topics in the Assessment section
• https://cns.utexas.edu/teaching-portal/exams