Engaging Students and Enhancing Learning with Lecture Skit Demonstrations

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Overview

• What could a lecture skit demonstration be?
• Illustrations and examples
• Student feedback
• Create an exercise
• Demonstrations
• Best practices?
• Wrap-up

Goal

You should leave with a partially to completely formed idea for a lecture skit demonstration you could use in your own course(s).
Why try?

Interactive activities promote student engagement and facilitate learning.

The start...

- Lecture skit demonstration:
  - A dramatic visualization of a concept

  "When the student is ready the teacher will appear."

- STLHE conference presentation – Dr. Ron Berk
  (Biostatistics & Measurement, The Johns Hopkins University)

- Act out an equation?!

The Courses

- Non-streamed (enrolment)
  - Chem 1A03 (1600), 1AA3 (1450); 4 sections
  - iSci 1A24 (40)

- Teaching Specialist: Explore possibilities for in-class interactive engagement activities
  - Discussion
  - Concept checks (iClicker)
  - Problem solving
  - Chemical demonstrations
  - Skit demonstrations
Using skits in class...

- **“KISS”**
  - Keep it Simple & Spontaneous

- When difficulty with a concept arose
  - created a demonstration to help

- Examples:
  - Strong acids vs. weak acids
  - Bond strength (single vs. double); isomers (E/Z)

What does it look like? (1)

- Hybridization aerobics

What skits have we used in class?

- VSEPR Aerobics / Hybridization Aerobics
- The S_n2 Mechanism & Inversion
- Aromaticity and Benzene
- State vs. Path Functions*
- Other, simpler models (restricted rotation, etc.)

*http://cll.mcmaster.ca/resources/teaching_tips.php?id=40
What does it look like? (2)

- The $S_N2$ Mechanism and Inversion

[Diagram showing the SN2 mechanism and inversion process with labels for nucleophile, leaving group, and transition state]
Beyond spontaneity – where to take it next?

• Strategically planning to develop / use exercises
  – And gather feedback on use

• Making the exercise “portable” for others
  – McMaster Chem Model: Instructional Team Approach

• Yet…maintain a highly spontaneous component
  – Create impromptu visual scenarios if the class struggles with a concept.

How to do this?

• Have a plan for a given concept
  – Approx. number of students needed
  – What actions students will take; props?
  – Ask for volunteers
    *Be prepared to adjust the plan based on # of volunteers!*

• It helps to have a talk-through
  – Explain the concept and physical mechanics to volunteers, along with the use of any props

What does it look like? (3)

• Aromaticity & Benzene
  
  ![Image](image_url)
What does it look like? (3)

- Aromaticity & Benzene – Delocalization

One electron (extra volunteer) – showing idea of delocalization (running around circle)

What does it look like? (3)

- Aromaticity & Benzene – Ions too!

Now a 7-membered ring

Discussion opportunity: How to make C\textsubscript{7}H\textsubscript{7} aromatic?

What types of in-class activities were most helpful for your learning in this course?

"The volunteer and other visual aspects were great."

"Interaction with classmates, etc. was a helpful way to learn selected topics."

"Instructor…provides fun demos. I have never missed a class."

- Anecdote: During exam study period
Individual Exercise: Create an Activity

- What could work for you?
  (Something new? Something adapted?)

- What concept could readily be accessed through this approach?

Supporting ideas for demonstrations and student involvement...

- Fun
- Memory "hook"
- Peer-peer connection
- Action for the kinesthetic learner
- Creative break in lecture (attention span)
- Greater # of people allows more elegant scenarios

What is needed?

Instructor:
- Comfort level with course material
- Willingness to
  - think beyond traditional methods & use creativity
  - try it and modify it so it works for you
  - set boundaries as needed (e.g., time limit!)

Students:
- Safe atmosphere in the classroom
  - Necessary for participation
  - Variations: instructor demos; students participate from their seats
- "Culture" and status with the class
  - “The Chemistry Players” (of the day)
Best Practices

- Working at your comfort level
- Designed interactive activities
- Feedback mechanisms
- Involve students in design

Research Opportunities

- A study to compare 2 populations
- Surveys
  - Qualitative
  - Quantitative
- Focus groups
- Interviews

A serious request!

- If you decide to try this in your class, please drop me a line….
  lockpe@mcmaster.ca
- I would be interested to know
  (a) How it goes
  (b) How you use it
- I would be happy to discuss any questions
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