Today’s EdTech: Tuning in, getting turned on, and building relationships

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Goal: deep, sustained learning
Challenge: how do we...
• Keep our students coming to class and AWAKE in class?
• Maintain communication with our students?
• Help develop confidence and community?
• Know where our students are struggling?
• Help students identify where they are struggling?
• Provide help when students need it? (24/7!)
• Help students who can’t come to class?
• Provide abundant and timely feedback?
• Stay excited about teaching the same class year after year?

TECHNOLOGY CAN HELP!

No-Tech Tools for Improving Students’ Mindset, Attitude and Persistence
• Teaching & Learning is about building relationships.
• Promote a Growth Mindset (Carol Dweck)
• Encourage self-reflection, thinking about learning (Metacognition, exam wrappers, journals)
• Provide a supportive environment, sense of belonging (redesigned syllabus)
• Facilitate formation of study groups (Organic Learning Communities, OLC)
• Focus on improving study skills (Saundra McGuire)

Metacognitive Exercise: Exam Wrapper
Survey given after 1st midterm exam
• Students reflect on how they prepared, mistakes made
• Students consider how they will prepare differently next time
• Extra credit offered for wrapper + exam corrections

Assessment of Mindset Redesign
Students reported increased awareness of metacognition and Study Skills

Students reported that redesign likely improved their grades

Learning-Focused Redesigned Syllabus
• Fosters a supportive and inclusive environment
• Uses first-person “you will do...” and “I will do...” format
• Increases student interest in course
• Encourages buy-in and promotes a sense of belonging
• Builds relationships: student/subject and student/teacher
Student Study Groups: Organic Learning Communities (OLC)

- Extra credit given for students who formed study groups outside of class
- Structured activities were occasionally provided for the OLCs
- XC required weekly meeting, Bb journal entry, end-of-quarter reflection on OLC experience

OLC Student Feedback

- I found that I was more willing to ask questions and be unsure about topics in my study group than I was with asking during class or even going to office hours (I'm just that type of person).
- A study group ended up being extremely helpful because even if not one of us understood something, we all felt a bit less overwhelmed since we knew that we were not alone.
- We actually suffered together which was okay because that boosted our confidence towards this class.
- I have never been a part of a study group before! I really enjoyed it.
- Also we were able to help one another understand difficult topics because we could look at the problems from multiple perspectives rather than relying solely on our own perspective.
- I think the fact that we did become friends was also a positive because it can be very difficult to make friends at a school that uses the quarter schedule.
- This created a level of support that reduced stress in other areas and allowed me to focus more on my coursework.

Assessment of OLC Experience

How valuable was OLC study group?

<table>
<thead>
<tr>
<th>Overall, I found the OLC to be a positive experience. (94% agreed)</th>
<th>I would have done just as well in this course without a study group. (69% disagreed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Tech-Assisted Student Learning

Online homework from publisher
(24/7 and immediate feedback, auto-grading)

- Skill-building, drill-type quizzes (can create in Blackboard)
- Adaptive learning
  - measures competency level for each SLO and customizes assignments
  - STEM: ideal for students with weak pre-requisite skills

Online Homework = Favorable Feedback

CHM 315 Online Homework Feedback (n = 36)

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Somewhat disagree</th>
<th>Neither agree nor disagree</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would use online homework if it was available in the next organic chemistry course (94% yes).</td>
<td>24</td>
<td>10</td>
<td>1</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>The online homework helped me learn organic chemistry (87% yes).</td>
<td>19</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>I spent more time working on organic chemistry each week because of the online homework (78% yes).</td>
<td>20</td>
<td>10</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Compared to if I had just used the textbook alone, it is likely that I earned a higher grade in this course by doing the online homework (74%).</td>
<td>18</td>
<td>8</td>
<td>6</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

Technology for Lab Preparation

- Online Quizzes (Blackboard): 27/7, instant feedback, formative assessment
- Animations (with worksheet) TLC | Extraction
**Technology for Lab Preparation**

http://www.cpp.edu/~lsstarkey/ochemlab

**Online Tutorials**
- Adobe Presenter (Pp plug-in)
- Flash/HTML5 animations
- filming of demos
- over 37,500 worldwide visitors to website since 2008

*Benefits: unlimited time, asynchronous, reviewable, available in the future (website/YouTube vs. LMS)*

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**Assessment of Technology**

**Prelab Quiz: Sketch Distillation Apparatus**

Percent of Students at each Score (Max Score = 10 points)

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**Assessment of Technology**

**Prelab Survey: Confidence in Running Distillation Experiment**

Mean = 5.0  |  Pre-tutorial  |  Post-tutorial  |  Mean = 7.6

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**Tech-Enabled Classroom Engagement**

**iClicker (CRS)**
- transition/wrap-up, formative assessment, exam review
- Library for Organic Chemistry Active Learning
  online repository: LOCAL
  Kahoot getkahoot.com
- gameshow-style M/C questions using mobile devices
- good for syllabus quiz, exam review

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**Making videos for the flipped classroom & beyond**

- Online lectures – search YouTube, Educator.com, EdX
- Create your own! “Old school-style” recording of narrated homework solutions (iPhone) 3D sketch reagent table
- Latest technology: transparent lightboard! (how it works)
- Record and edit videos with Camtasia (screen capture/voice) Tutorials: http://tiny.cc/CreatingPedagogicalVideos
  Examples: Engineering tutorial and solved problem
- Lecture-capture w/iPad apps - can export videos to YouTube
  Explain Everything Cyclohexane and Doceri Reagent Table
**Sharing your work**
- Private (LMS) or Public (webpage link, MERLOT)
- Include **captioning** for accessibility (Hablas Español? Sí!)
- Maximum exposure: make a YouTube channel!
- ChemistryConnected, created in 2012, has over 480,000 views and over 970 subscribers
- Pre-lab tutorials, solved problems, demos of hands-on elementary school science activities
- Over half the views have come from outside the U.S. (200 different countries)
  [http://www.youtube.com/user/ChemistryConnected](http://www.youtube.com/user/ChemistryConnected)

**Making it Academic – SoTL Research**
- Turn your innovation into a research project!
- Formulate a question
- Collect data (can be a great “wow” factor)
  - Get IRB approval (Human Subjects)
  - Pre- vs. Post-Intervention
  - Quantitative and Qualitative data
  - Perform assessment; analyze data
  - Share results with colleagues and the world!
  - Conference paper, Ed. Journal article, RTP

**Getting Buy-In and Support from Students, Faculty, Institution**
- Poorly implemented interventions unlikely to succeed
  - If you are enthusiastic, students are likely to be too
  - Explain WHY you do what you do – pedagogy matters!
- Share data and testimonials and data with colleagues – encourage a SoTL-supportive culture
- Institutional $upport: workshops, summer institutes, release time, mini-grants, free iPads (!), Faculty Learning Communities (clicker, SoTL, technology)
- Collaborate with research students, other institutions...

**Take-Home Message #1**
**Variety in Teaching = Engaged Students**
- Audiovisual presentations blows away text
- Interactive lessons exercise different “muscles”
- Teaching to learning styles is a “neuromyth,” but audio & captioning helps ALL learners
- Online tools offer asynchronous and mobile delivery, pause button, unlimited replay, etc.
- **Most students need more than textbook support!** Online homework and adaptive learning tools enable immediate feedback/formative assessment

**Take-Home Message #2**
**Technology to Improve Mindset: Tapping into the Affective Domain**
- How the student feels about the class affects learning!
  (technology-infused learning can be fun, interesting, engaging, informative, helpful, shiny and new)
  *Our students are digital natives and expect technology.*
- How the teacher feels about the class affects teaching!
  (technology-infused teaching can be fun, interesting...)
- Students learn better if they feel the instructor cares about their learning.
  *Students appreciate the effort you put in to support their learning. A better attitude about you, about the class, and about the subject can lead to better learning!*

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