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

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QR Code for my homepage

Teaching & learning resources

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
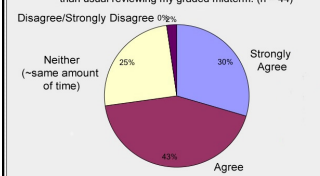
- Teaching & Learning is about **building relationships**.
- Promote a Growth Mindset (Carol Dweck)
- Encourage self-reflection, thinking about learning (Metacognition, exam wrappers, journals)
- Provide a supportive environment, sense of belonging (redesigned syllabus)
- Facilitate formation of study 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

Because of the Post-Test reflection survey, I spent more time than usual reviewing my graded midterm. (n = 44)

- Strongly Agree 30%
- Agree 43%
- Neither (~same amount of time) 25%
- Disagree/Strongly Disagree 0%/2%

Spent more time reviewing graded midterm?

How likely is it that the Post-Test reflection survey improved your grade on the second midterm and/or final exam? (n = 44)
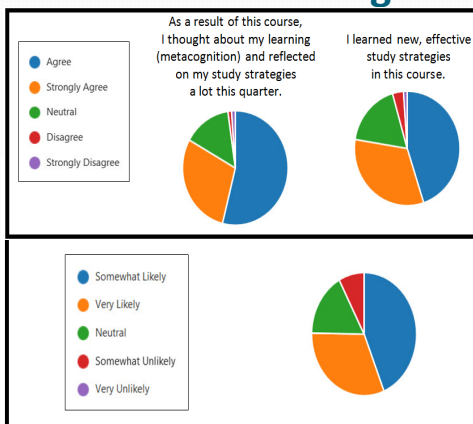
- Very Likely 23%
- Somewhat Likely 36%
- Not Sure 25%
- Somewhat Unlikely 7%
- Very Unlikely 9%
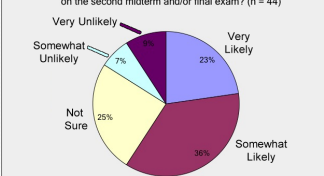
Improved grade on second midterm?

Assessment of Mindset Redesign

Students reported increased awareness of metacognition and Study Skills

As a result of this course, I thought about my learning (metacognition) and reflected on my study strategies a lot this quarter.

I learned new, effective study strategies in this course.

- Agree
- Strongly Agree
- Neutral
- Disagree
- Strongly Disagree

Students reported that redesign likely improved their grades

- Somewhat Likely
- Very Likely
- Neutral
- Somewhat Unlikely
- Very Unlikely

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

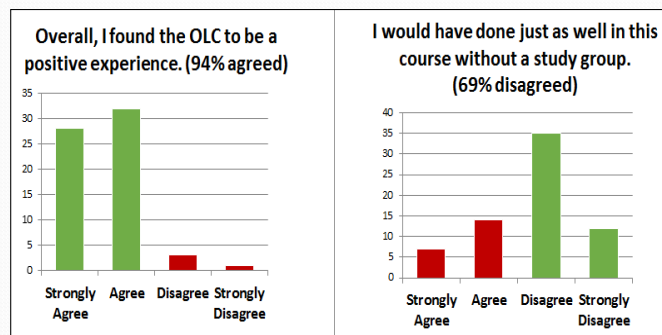## Student Study Groups: Organic Learning Communities (OLC)

- 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?

Overall, I found the OLC to be a positive experience. (94% agreed)

I would have done just as well in this course without a study group. (69% disagreed)
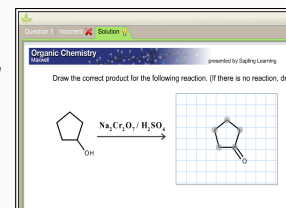
Tech-Assisted Student Learning
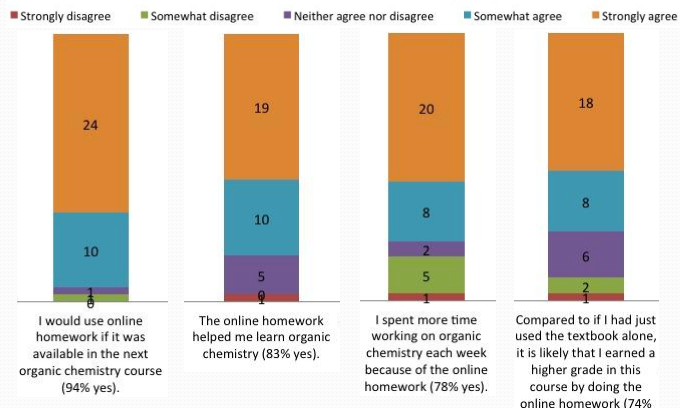
Online homework from publisher
(24/7 and immediate feedback, auto-grading)

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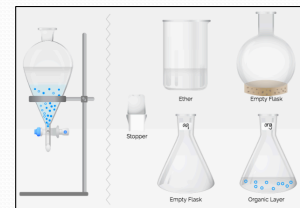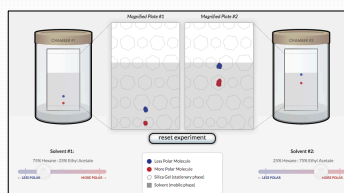 - STEM: ideal for students with weak pre-requisite skills

Online Homework = Favorable Feedback

CHM 315 Online Homework Feedback (n = 36)

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I would use online homework if it was available in the next organic chemistry course (94% yes).

The online homework helped me learn organic chemistry (83% yes).

I spent more time working on organic chemistry each week because of the online homework (78% yes).

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%

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

🇺🇸	United States	32,571	87.00%
🇨🇦	Canada	663	1.77%
🇮🇳	India	441	1.18%
🇵🇭	Philippines	434	1.16%
🇬🇧	United Kingdom	198	0.53%
	Iran, Islamic Republic...	122	0.33%
🇹🇭	Thailand	121	0.32%
🇯🇵	Japan	119	0.32%
🇲🇾	Malaysia	119	0.32%
🇨🇳	China	118	0.32%

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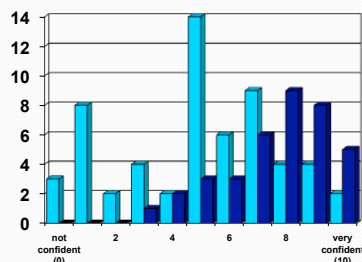

Assessment of Technology
Prelab Quiz: Sketch Distillation Apparatus

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

☐ Pre-tutorial ■ Post-tutorial
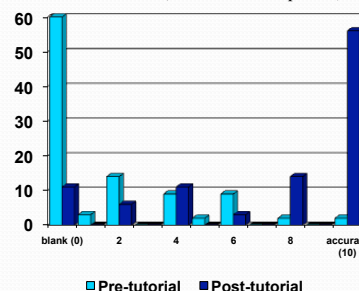
Assessment of Technology
Prelab Survey: Confidence in Running Distillation Experiment

Mean = 5.0   ☐ Pre-tutorial ■ Post-tutorial   Mean = 7.6

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)

Tech-Enabled Classroom Engagement

YouTube demos, simulations, animations
- free, no hazards, can pause/watch later, etc.
- find resources: PhET, MERLOT.org
- can support a flipped classroom model

Potassium - Periodic Table of Videos

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? Si!)
- 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

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!*

Support & Acknowledgments

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