Synchronous Online General Chemistry Designed for Frequent Feedback and Collaboration

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Background

Students in General Chemistry courses at open enrollment institutions often have a wide breadth of college and course readiness skills and overall confidence in those. This online course was designed to provide continuous feedback from instructor, peers, and electronic platforms to help bridge some of these learning gaps.

Course Structure

- College General Chemsitry I
- MWF Synchronous online class (70 students, 12 teams), Microsoft Teams
- Tu Synchronous online PLTL, Microsoft Teams
- Canvas course management
- Smartworks online homework
- Kaltura video and quizzing

Unit Test Structure

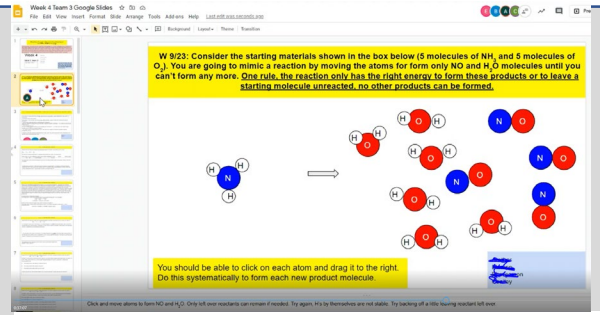
- Online, open book/note, open for 3-4 days
- Parts A and B timed multiple choice, one answer no feedback
  - Student turn in written journal of work
- Part C open response
- 24 hours after close, new version of Parts A and B open for retake with 5 attempts, correct answers indicated

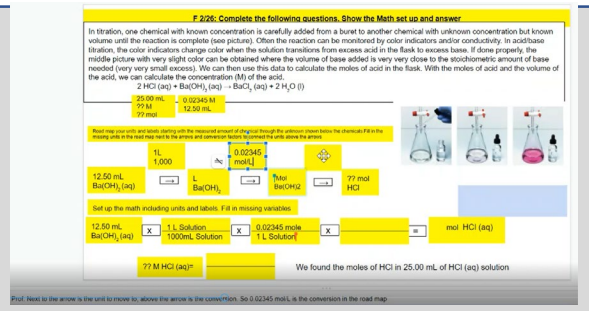
Weekly Course Design (W to Tu)

Peer Support | Growth Mindset with Feedback
Guided Inquiry | Process Focused | Spaced retrieval practice | Interleaved Practice

Announcements Video	Weekly Bonus Question Slide	Video pre-Lecture with embedded quiz (W, F, M)	Weekly Team Google Slides (due W)	Peer-Led-Team-Learning (PLTL) (Tu)	Weekly Online Homework (Due F)	Weekly Quiz (Due F)

- Bonus Question: Student prepare google slide on assigned chemical application concept, add to Team slides
- Lecture video: Focus on key terminology and process (even chemical capitol between students)
  - Video structure: Lecture – quiz question – answer and discussion of common error, repeat
- Team Google Slides (W, F, M): 5-6 students per team, Student roles
  - POGIL activities and guided problem solving with extension problems between days
  - Team and individual accountability
  - Daily feedback on slide notes during and after each class
- Need more study but initial outcomes very positive. very high student evaluations, high percent A and B, lower percent DFW





- Instructor moves between slides, uses typing and voice/video for feedback
- After class: additional feedback
- Student leave comments and respond to comments
- Icon movement visible

Feasibility Survey on Testing Feedback (44 consented students)

- 75% reported completing all three unit exam feedback assignments, 14% completed some of the 3, 11% completed non of the three
- Of those who completed feedback:
  - only 1 student reported guessing until correct
  - 98% reported a combination of reworking the problems, remembering answers, and guessing
  - On a scale from not at all useful (1) to very useful (5): median response was 4, 73% reported 4 or 5
  - Representative student response: I found them useful because I got to see what I got wrong and then got a second chance to figure out why my answer was incorrect and work through the problem

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