



Introductory biochemistry: The art of biochemistry in the digital age

Kyle Murphy, Ph.D.

Ismael Lara, M.S.

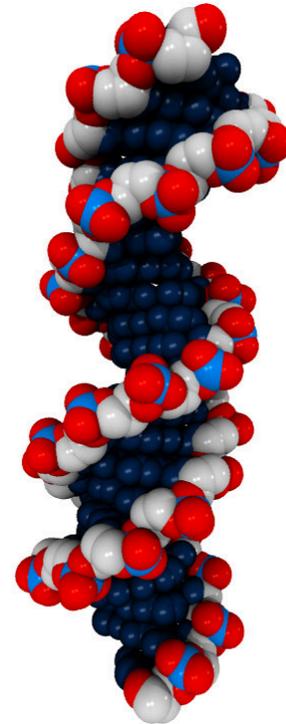
Rutgers University
New Brunswick, New Jersey

About Us

- Kyle Murphy, Ph.D.
 - Instructor
 - Taught biochemistry 8 years
 - Teaching at Rutgers University since 2012
- Ismael Lara, M.S.
 - Senior Instructional Designer at Rutgers University
 - Adjunct Faculty
 - Taught both online and face-to-face courses in programming and information technology

The first iteration

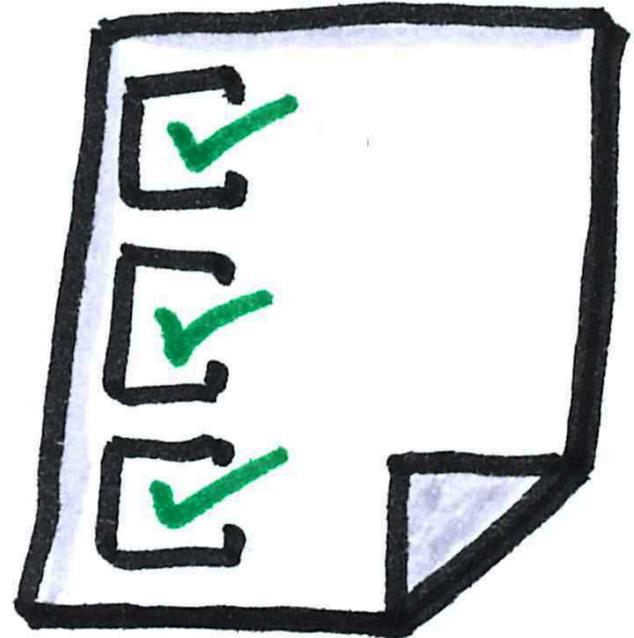
- First taught Biochemistry as face-to-face course in Summer (2008)
- The Course consisted of 4 exams and a final exam delivered in person.



Next Steps

Over multiple iterations of the course, I implemented several changes:

1. Anti-cheating mechanisms
2. Peer-Reviewed Articles
3. Student-created videos
4. Learning modules



Cheating: Inside and outside the class

Biochemistry Study Group

Kyle Home

Biochemistry Study Group

Closed Group

Join Group

Join this group to see the discussion, post and comment. [+ Join Group](#)

MEMBERS 101 Members

DESCRIPTION

Welcome!

We gather here to exchange information, and help each... [See More](#)

CREATE NEW GROUPS

Groups make it easier than ever to share with friends, family and teammates. [Create Group](#)

CREATE NEW GROUPS

Rutgers University Friends [Get Started](#)

South Amboy Middle High School Friends [Get Started](#)

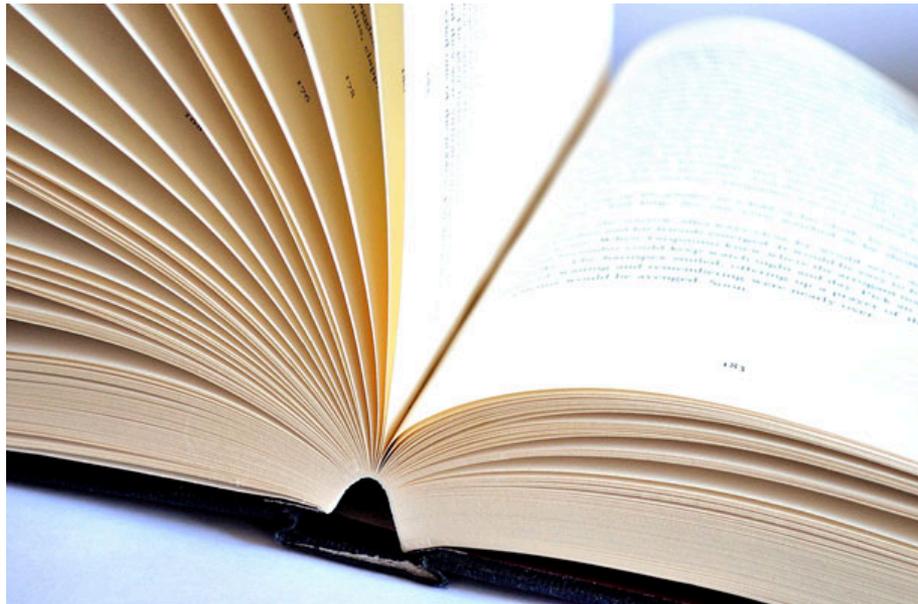
SUGGESTED GROUPS [See All](#)

Solution: Question Pools



Exposure to Research

- Problem
 - Textbook content gets out-of-date quickly, and students are never exposed to actual, current research. The skills of not relying on reviews in textbooks is critical for cutting edge science.



Exposure to Research

- Solution
 - Form small groups, and read/comment on peer-reviewed research articles



Exposure to Research

Peer-Reviewed Enzymology Paper Comments for Grade Posted Here Di Nardo Groups 1-8 [New Topic](#) | [Forum Settings](#) | [More](#) ▾

Here is where you need to place your original comment and one additional comment in response to another student. Please see the guide contained on Sakai about proper use of tone and professionalism in posting.

▾ [Hide Full Description and Attachment\(s\)](#)

Here is where you need to place your original comment and one additional comment in response to another student. Please see the guide contained on Sakai about proper use of tone and professionalism in posting. A rubric and a set of instructions will follow next week. For now, start reading the paper.

 [Instructions for Peer Review Article SP 2016.docx](#) 

 [Paper Di Nardo.pdf](#) 

Questions about Responses - Di Nardo 0 unread of 0 messages [Topic Settings](#) | [More](#) ▾

Please ask any questions about responding to another person in this topic.

Questions about Paper - Di Nardo 6 unread of 10 messages [Topic Settings](#) | [More](#) ▾

This section is for questions only. Do not post your final response in this topic thread.

▶ [View Full Description](#)

8 8 unread of 8 messages [Topic Settings](#) | [More](#) ▾

▶ [View Attachment\(s\)](#)

6 9 unread of 9 messages [Topic Settings](#) | [More](#) ▾

▶ [View Attachment\(s\)](#)

7 13 unread of 13 messages [Topic Settings](#) | [More](#) ▾

▶ [View Attachment\(s\)](#)

5 12 unread of 12 messages [Topic Settings](#) | [More](#) ▾

▶ [View Attachment\(s\)](#)

4 12 unread of 12 messages [Topic Settings](#) | [More](#) ▾

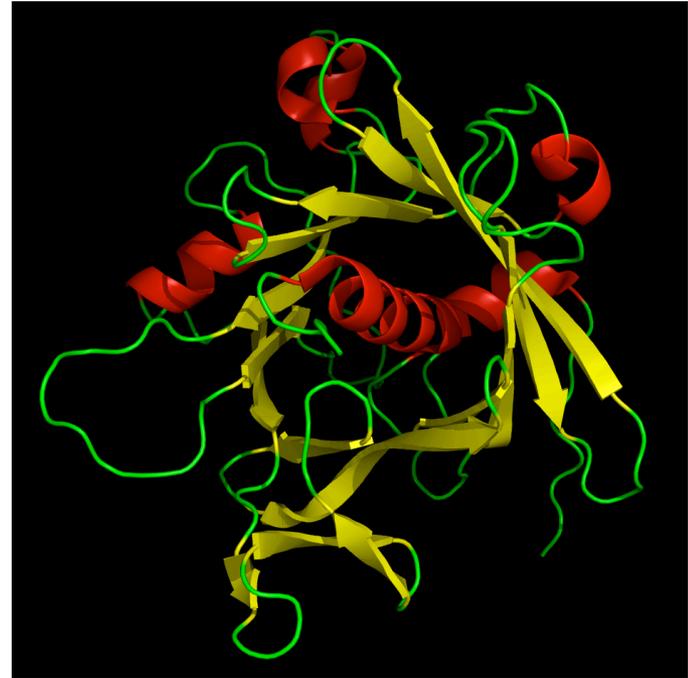
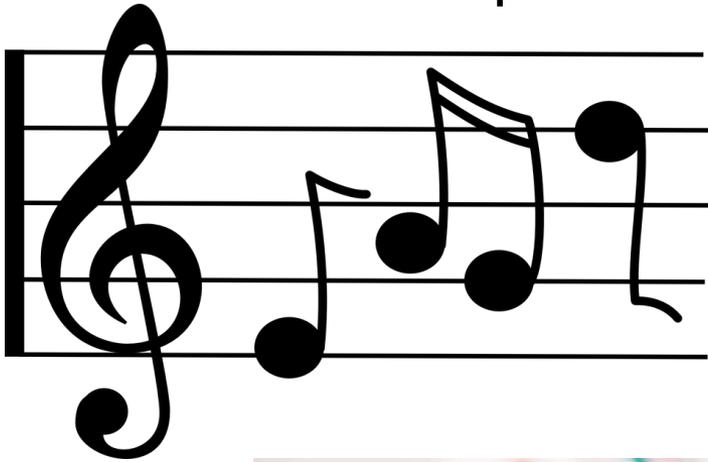
▶ [View Attachment\(s\)](#)

3 13 unread of 13 messages [Topic Settings](#) | [More](#) ▾

▶ [View Attachment\(s\)](#)

Student Videos

- Problem
 - I wanted to provide opportunities for creativity.



Student Videos

- Solution
 - Integrating art and biochemistry
 - Here's a mash-up of 3 videos that students have created.

Student Videos



Learning Modules

- Problem
 - The course was not very interactive
 - Textbook publishers were advertising highly interactive animations, but only if I adopted their textbook

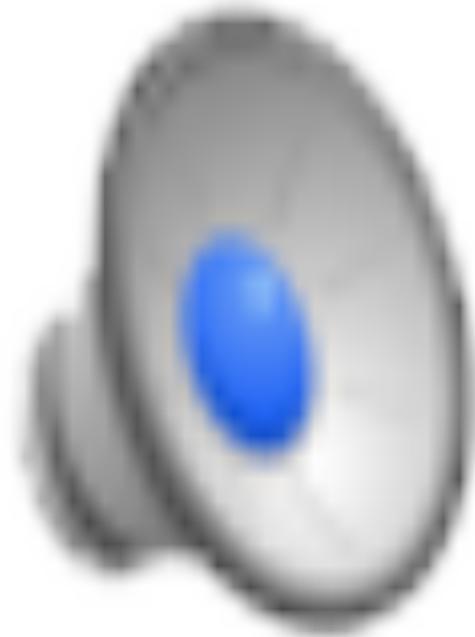


Learning Modules

- Solution
 - I liked the idea of the animations, so we built our own using Adobe Captivate
 - “Self-Guided Learning Modules” (SGLMs)



Learning Modules



Student Evaluations Spring 2015...Before Conversion

- **If you were teaching this course, what would you do differently?**
 - Dr. Murphy doesn't allow skipping questions to return later during online exams - this is a hindrance of a basic test taking skill and is not beneficial for students.
- **In what ways, if any, has this course or the instructor encouraged your intellectual growth and progress?**
 - To not take online exams for granted and still study as if it wasn't online

Student Evaluations Fall 2015 After Conversion

- **What do you like best about this course?**
 - “I like how grading is spread out with online HW, quizzes and exams.”
 - “the class forum project” (Research Articles)
 - “Video extra credit” (Student Videos)

Our thoughts (Instructor)

- The current course requires student engagement on a more constant basis to enable greater retention.
- Course design is amenable to either an online or in-person format.
 - Currently being taught in both formats simultaneously
- A good start to using Self-Guided Learning Modules (SGLMs) to assist in student learning.

Our thoughts (Designer)

- Many different components make up the final grade
 - Students can showcase their strengths in different areas (writing vs. taking exams)
- Question Pools provide one method to reduce cheating
- Allowing for creativity really engages students
- Animations bring the content to life (no pun intended)

Looking Ahead

- Want to make more 5 minute SGLMs targeting essential theories in biochemistry.
- Exploring further ways to reduce cheating.
- Adding more questions to question pools and organizing them by topics.

ANY QUESTIONS?