Caitlin Reeves

Teaching Portfolio

University of Georgia

Microbiology Department

Spring 2017

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When I was younger I remember finding a caterpillar outside. My mother helped me set up a habitat for it and over time I watched this caterpillar go through its metamorphosis into a butterfly. I was fascinated watching this creature grow and change, and because of this I wanted to know the why and the how of the process. I was engaged in learning about this because I was seeing it first hand, it was tangible and relevant and right in front of me. My love of science continued on; why does bread rise, how do microscopic organisms make me sick, and so many more questions. But as a college student in the sciences so many teachers asked me to sit and listen to them talk and then regurgitate bits of knowledge as proof of my learning. This, to me, was not learning but simply memorization of facts to get the grade I desired. I was not engaged in learning. Because of these experiences I strive to engage students in learning in various ways. I work to introduce students to the wide variety of topics present in the sciences and how it relates to their lives. I then give them the tools to learn about these subjects in more detail on their own. To do this I integrate current research into the classroom, utilize critical thinking activities, create engaging lecture environments, and remain accessible to students.

By utilizing current research studies as well as bringing in other professors to give guest lectures I can relate current scientific studies to topics covered in class. By doing so students are exposed to experts in the subject as well as how it is currently relevant to science today. The use of current research studies also allows for the creation of activities that facilitate discussion and critical thinking. One example is the use of case studies where students are presented with a scientific scenario that they analyze and answer questions on. One example is using the case of "Typhoid Mary", in which one women caused an outbreak of Typhoid fever, to teach epidemiological terms and concepts. Students walk through the scenario of "Typhoid Mary" and identify the source of contamination, mode of transmission, and attack rate. This allows students to draw bridges between various topics covered while applying them to real life scenarios. I believe that these measures also allow students to engage in learning as they think through these activities. This moves away from rote memorization of material that I feel is ineffective in learning.

When a lecture format is appropriate for covering certain material I make it as interactive as possible. Through the use of skeleton slides that lack some of the information present in the actual lecture slides students remain engaged through the lecture to complete the slides. Use of short breaks every 10 minutes for active learning strategies, such as think-pair-share and concept maps, help to break up the long class time for better focus and allow for synthesis of material covered thus far. These in class activities also allow for immediate assessment of students retention and understanding of the topic. This allows for identification of misconceptions that I can then immediately address and correct in class. These strategies help to make these lectures an engaging process, not a passive one.

I also make a point to be accessible to students via email, office hours, and before or after class time. This allows students to easily contact me with questions related to lectures, class activities, outside of class activities, and with any inquiries for further information on various topics. When students struggle with exams and seek help, I work to mentor them on effective study habits and teach them new study techniques that will benefit them in all their courses. Being accessible in this manner allows me to help students address their individual concerns and struggles. This allows me to better act as a guide to science and help students feel they are supported in their learning endeavors.

Just like I was fascinated by the caterpillar I want students to be fascinated by the course material, and to see how it plays a role in their every day life. As a teacher I work towards this by utilizing the various methods mentioned to engage students in science in a way that they are actively involved in the learning process. I wish for students to not leave the content in the classroom, but carry it on throughout their life making them a more informed individual in whatever they pursue.

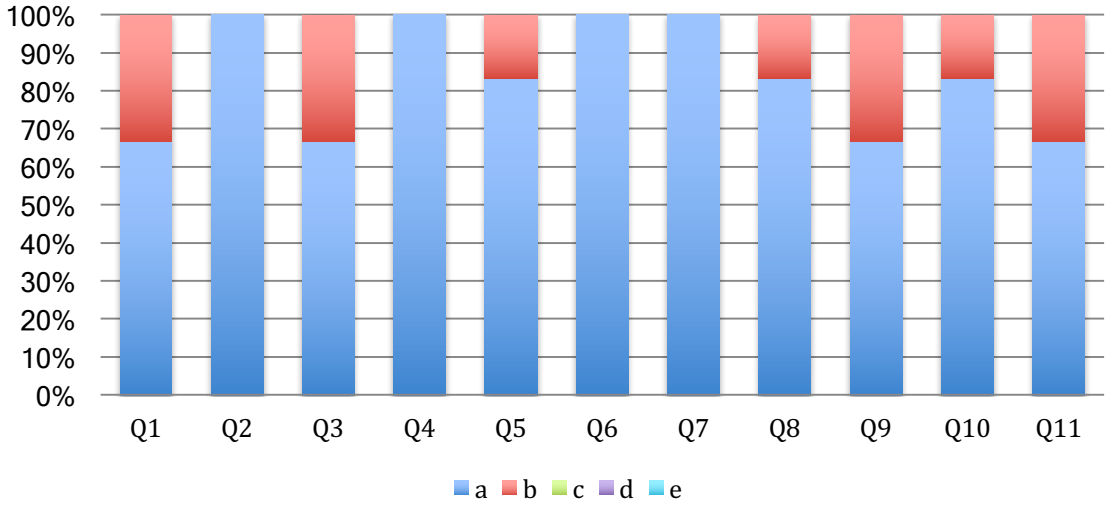
Health Care Microbiology (3 credit hours, MIBO2500)

Role: Instructor of Record
Semesters Taught: Fall 2016, Spring 2017 (*in progress*)
Enrollment: 15 (Fall) 25 (Spring) students - undergraduate Allied Health students
Course Content: Infectious diseases emphasizing the nature of the organisms, the interrelationship of microorganisms and human hosts, the prevention and control of infectious diseases, and a description of the important infectious diseases of humans.
Teaching Role: My responsibilities included preparing lectures on material for classes that included active learning strategies such as think-pair-share. To develop critical thinking skills group activities were implemented to facilitate discussion and synthesis of the material learned in lectures by integrating real world situations in to the classroom. Student's progress was monitored by weekly reading questions, group activities, and biweekly mini-exams.

Teaching Evaluations
Fall 2016

Evaluation process: For each of the following questions, students rated the quality of instruction from A to E. A is the top 20% of instruction at UGA and E is the bottom 20%.

Q1: Preparation and organization of material for individual class
Q2: Use of class hours
Q3: Clarity of assignments
Q4: Class control
Q5: Presentation
Q6: Willingness to help students
Q7: Tolerance
Q8: Does the instructor make the grading policy clear?
Q9: Knowledge of Subject
Q10: How effective of an instructor
Q11: How do you feel about the number of tests given?



Selected Student Comments

"Caitlin was an exceptional instructor, especially with it being her first semester teaching. She was beyond approachable, and she was extremely patient with each student's learning pace. She accommodated each student to each of their needs as concerned. She guided the class discussions with the material, but also allowed for the discussion to veer off enough to engage the class."

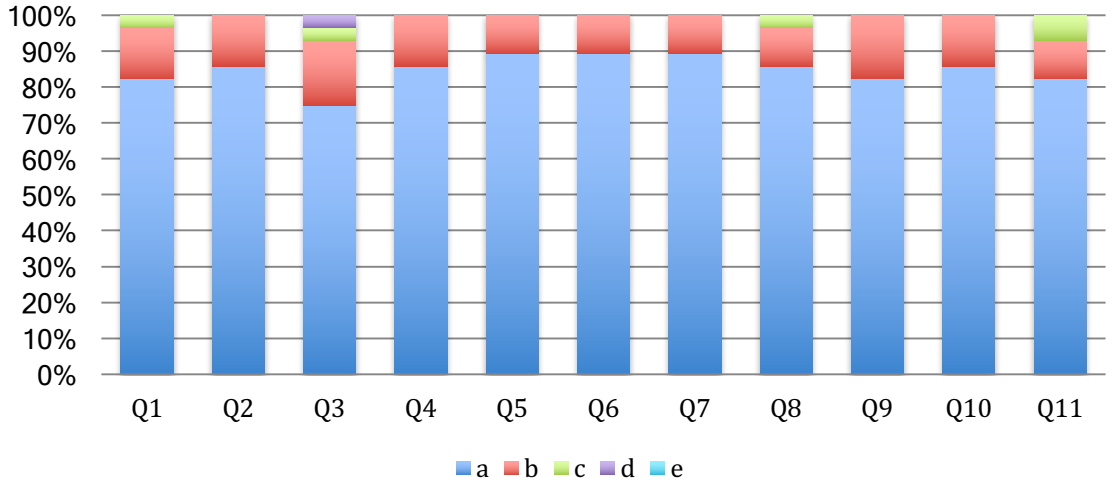
"I really enjoyed the class after the mid-semester evaluation many of the problems were resolved. Caitlin cared a lot about us as a class and provided many opportunities for help with the material such as webcasts, "muddiest points", and exam review sheets."

"She was able to explain concepts well and give us ways to remember what we learned. She was always willing to help…. I learned some new study methods that have proved very helpful for Microbiology as well as my other courses"

Introductory Microbiology Lab (3 credit hours, MIBO3510L)

Role: Teaching Assistant
Semesters Taught: Spring 2014, Spring 2015
Enrollment: 18 students per section (2 sections) undergraduate majors and non-majors
Course Content: Microscopy, growth requirements, selective and differential media, unknown bacterium identification, mutagenesis, environmental microbes
Teaching Role: My responsibilities included leading class discussion on various topics, providing directions on how to complete lab exercises, and guide students as they worked through lab exercises. The progress of students was monitored by discussion questions and grading of quizzes and exams. I worked to develop students critical thinking, analytical, and oral skills by helping them to develop oral presentations on a scientific article of their choosing. Students also develop these skills as I guide them through a project to identify an unknown bacterium.

Teaching Evaluations
Spring 2014



***Questions used are the same as those stated for MIBO2500 evaluation**

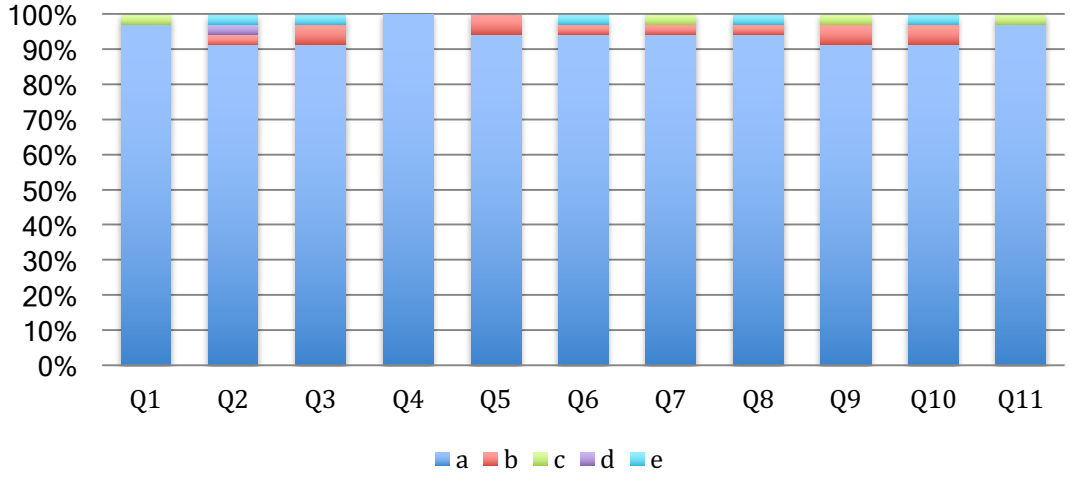
Selected Student Comments

"Caitlin was so nice because she was always willing to help, and she never belittled students for asking questions."

"She is an extremely effective lecturer and guide in this lab course. She never explicitly gives out answers, but always helps to lead us to the logical explanation (which really helped me to LEARN the material, not MEMORIZE it.) She is more than willing to take time out of her extremely busy graduate schedule to assist us with our various projects and presentations, which is absolutely amazing. She is always very clear and fair on her grading. Overall, Caitlin is a wonderful person and an outstanding TA."

"Caitlin did an excellent job keeping students engaged and challenged them as well! She was always willing to provide guidance and offered individual assistance when asked. Overall a very enthusiastic, passionate TA who really made the course fun for me!"

Spring 2015



***Questions used are the same as those stated for MIBO2500 evaluation**

Selected Student Comments

"One of the best TAs I have had in a science lab class! Very effective in communicating information. She is inspiring"

"The instructor was always prepared and had a great attitude about being in lab so early. She was clear in what she expected and did not waste time. She was extremely helpful during lab and provided us with all of the information and tools we needed to succeed. She was definitely the best TA I have had in my four years at UGA and should honestly be the one teaching the lecture."

Introductory Microbiology (3 credit hours, MIBO3500)

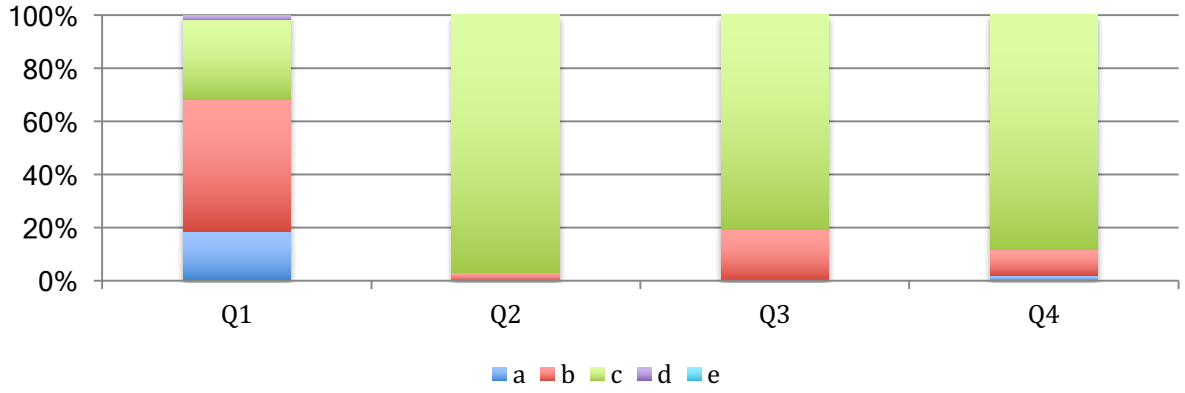
Role: Guest Lecturer
Semesters taught: Fall 2015
Enrollment: 242
Course Content: Microorganisms, with special emphasis on bacteria, their structure, function, diversity, and importance to man.
Teaching Role: My responsibilities included giving three guest lecturers throughout the semester. The first lecture was given using materials provided by Dr. Krause, the second lecture was given using materials from Dr. Krause and myself, and the third lecture was given using my own materials. These lectures were designed to give me lecturing experience and improve my skills via feedback from student surveys and evaluation by Dr. Paul Quick of the CTL and Dr. Duncan Krause (course instructor).

Teaching Evaluations

For each lecture students were asked to complete a survey to provide feedback for future improvement. For all three surveys questions 1-4 were asked, additional questions were added if need be.

Q1: How well was the lecture paced?
a) Too fast b) A little Fast c) Perfect d) A little slow e) To slow
Q2: How well did the lecturer stay focused on the topic of the lecture without too many tangents of extraneous content?
a) Unfocused/wandering b) Somewhat unfocused/wandering c) Focused
Q3: How well did the lecturer communicate the content of the lecture?
a) Not well b) Somewhat well c) Quite well
Q4: How well did the lecturer present the lecture in terms of movement in front of the room, eye contact, and voice quality (volume, modulation/inflection)?
a) Not well b) Somewhat well c) Quite well

Lecture 1: 67 student responses



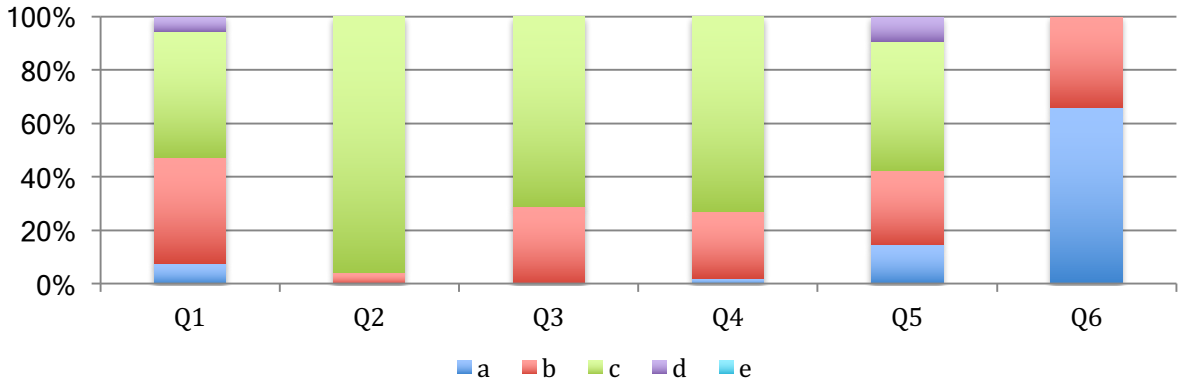
Selected Student Comments

"You did a great job, and it was evident you really knew what you were talking about! I know there was a lot of material to cover, but at times the pace of going through slides was really fast, which made it harder to process a few concepts."

"Moved fast, although great transitions and examples within and between slides"

Lecture 2: 52 student responses

Q5: Compared to what you remembered about the first lecture that Ms. Reeves delivered, how "rehearsed" was this lecture?
a) Very rehearsed b) Somewhat rehearsed c) Relatively "natural" d) Natural/conversational
Q6: From what you remember about Ms. Reeves's previous lecture, how did her second lecture compare?
a) 2nd lecture better then 1st b) 2nd lecture comparable to 1st c) 2nd lecture was worse then 1st



Selected Student Comments

"I enjoyed the last lecture as well, just thought it was a little fast-paced but this time was perfect."

"The second lecture was better, but still seemed a little rehearsed; not really a big deal though considering she's still getting used to it… Her knowledge on the subject matter is obvious; it'll just take time for her to present that knowledge more fluidly as she gains more experience and can really branch out to give more examples; actually better than many professors with years of experience"

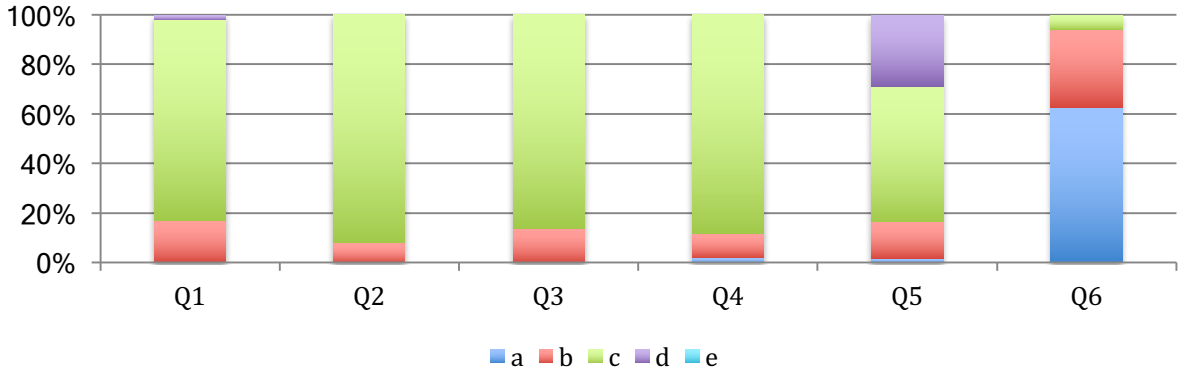
Lecture 3: 63 student responses

Q5: Compared to what you remembered about the previous two lectures that Ms. Reeves delivered, how "rehearsed" was this lecture?

a) Very rehearsed b) Somewhat rehearsed c) Relatively "natural" d) Natural/conversational

Q6: From what you remember about Ms. Reeves's previous lecture, how did her second lecture compare?

a) 3rd lecture better then 2nd b) 3rd lecture comparable to 2nd c) 3rd lecture was worse then 2nd



Selected Student Comments

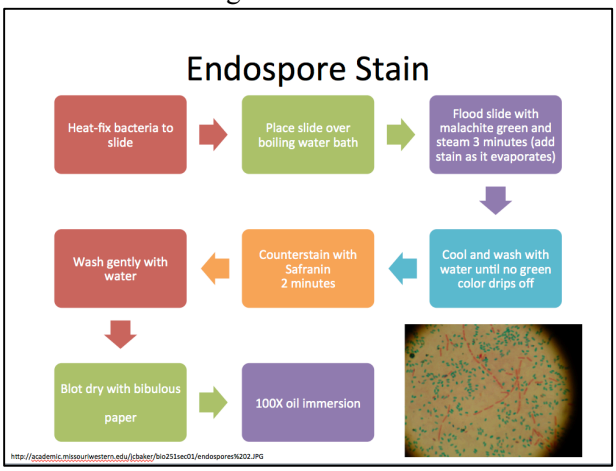
"Today's lecture was so much better! It really seems like Caitlin took the criticism from the previous two lectures and incorporated it into her lecture today."

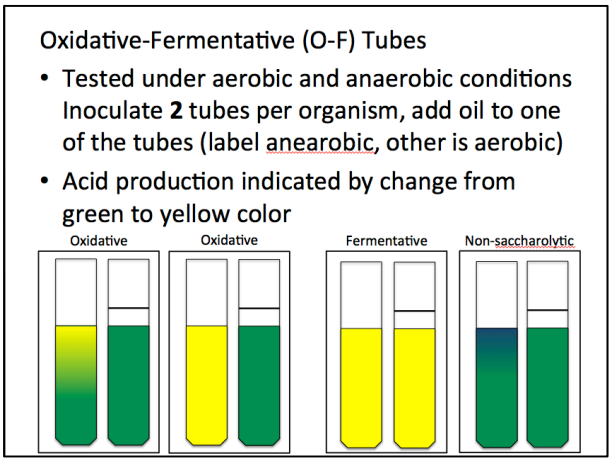
"I like her teaching style. She spoke fairly quickly the first time but has progressively gotten better at slowing her pace. I like how confident and comfortable she is with the content because it makes second guessing what she said happen less. She also uses analogies that have helped when the concept being covered initially appeared overwhelming. I'd recommend her to friends if she taught MIBO 3500 in future semesters"

Introductory Microbiology Laboratory (MIBO 3510)

Pre-lab Lectures

I delivered short 10-minute pre-lab lectures to students prior to starting that days experiment. With these short lectures I worked to reiterate the main scientific concepts being studied that day as well as going over specific laboratory techniques they would be doing that day. At the time the course laboratory manual provided no image depictions of expected results, so I was able to utilize the lecture slides to adapt the curriculum and create visuals of potential results they may see. These slides were then shared with fellow teaching assistants to use in their own laboratory sections. See example slides below.





Exam Questions

I provided potential written and practical exam questions to the Instructor of Record to be considered and used on the exams. Below are examples of questions provided that were used on the written or practical exam. Questions were designed to test student's ability to apply what they learned during laboratory experiments to different scientific concepts.

Example Questions: Questions in black, answers in red.

MIBO 3510 Practical Final 2015

Station 11 Students are presented with a variety of labeled agar plates and asked to answer the following questions:

a) Of these plates, which set would you use to calculate spontaneous mutations? 0s UV NA+Strep

b) Which would you use to calculate induced mutations? 30s UV NA+Strep

c) What effect does UV exposure have on bacterial cells?
Damages DNA by causing the formation of thymine dimers, this leads to mutations.

MIBO 3510 Written Final 2015

Question 3/8 (2pts)

When performing UV mutagenesis, we first grew our UV-exposed colonies on nutrient agar overnight, then transferred these colonies to NA+Streptomycin. Why couldn't we simply plate the UV exposed bacteria straight onto NA+Strep?

UV mutagenesis happens during cell division, before this you may not have the mutant phenotype and you need the cells to replace most of the proteins before the cells can become strep resistant.

Health Care Microbiology (MIBO2500)

Exam Questions

Students are given eight "mini-exams" each semester worth 60 points and consisting of 20 questions each. I created questions ranging from multiple choice, true-false, fill in the blank, and short answers. This allowed me to test students retention of basic concepts as well as test their ability to apply these concepts to critical thinking questions.

Example Question: Question in black, answers in red.

Answer the following statements as true or false. If false correct the statement in one sentence or less.

a) The F pilus is necessary for F+ conjugation to occur. True
b) During conjugation single stranded DNA is taken up by the cell from the environment. False, this occurs during transformation. OR they could say False, during conjugation the single stranded F plasmid DNA is transferred from the F+ (donor) cell to the F- (recipient cell)
c) A F+ bacterial cell mates with an F- bacterial cell. After this process occurs both cells are now F+. True

In-Class Learning Strategies

During class lectures I utilize active learning strategies, such as think-pair-share, that gives students a moment to pause, synthesize, and apply the material as seen in example 1. In class questions are also used to stop and have students think about the material we just discussed and make connections to other topics as seen in example 2.

Think-pair-share:

What would be the advantages to using phage therapy when compared to antibiotics when treating bacterial infections?

Example 1: Students were asked to think individually on the question and then discuss with a partner. Then as a class we generated a list on the board of what advantages phage therapy may have.

Example 2: Students were given a multiple choice questions that required them to make connections between the type of drug and how it might work for patients of differing backgrounds. Students then answered using the plicker technology (student response system that utilizies paper cards with QR codes to record student answers).

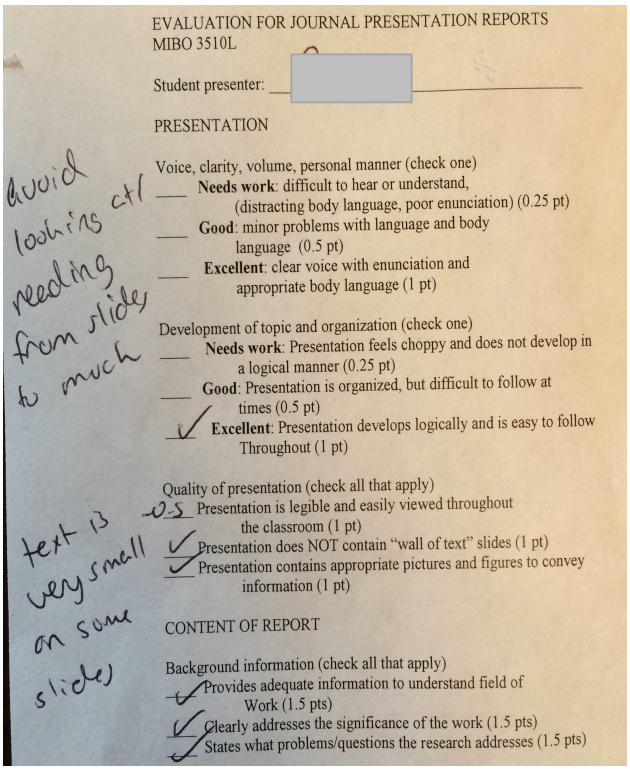
Which of the following patients would you lean toward prescribing a bacteriostatic drug? What about a bactericidal?

a. Elementary school boy
b. Woman on immunosuppressive drugs
c. Middle aged body builder
d. Pregnant woman

Caitlin Reeves

Introductory Microbiology Laboratory (MIBO 35010)

I worked to provide students with thorough feedback on all assignments to help them improve on future assignments and recognize knowledge gaps. I frequently went over questions in class that were missed by multiple students on assignments and exams. I also provided feedback on in class journal article presentations both on the presentation slides themselves and the student's oral presentation skills as seen in Sample 1.



EVALUATION FOR JOURNAL PRESENTATION REPORTS
MIBO 3510L

Student presenter: [redacted]

PRESENTATION

avoid looking at/ reading from slides to much

Voice, clarity, volume, personal manner (check one)
___ **Needs work**: difficult to hear or understand, (distracting body language, poor enunciation) (0.25 pt)
___ **Good**: minor problems with language and body language (0.5 pt)
___ **Excellent**: clear voice with enunciation and appropriate body language (1 pt)

Development of topic and organization (check one)
___ **Needs work**: Presentation feels choppy and does not develop in a logical manner (0.25 pt)
___ **Good**: Presentation is organized, but difficult to follow at times (0.5 pt)
✓ **Excellent**: Presentation develops logically and is easy to follow Throughout (1 pt)

Quality of presentation (check all that apply)
-0.5 Presentation is legible and easily viewed throughout the classroom (1 pt)
✓ Presentation does NOT contain "wall of text" slides (1 pt)
✓ Presentation contains appropriate pictures and figures to convey information (1 pt)

text is very small on some slides

CONTENT OF REPORT

Background information (check all that apply)
✓ Provides adequate information to understand field of Work (1.5 pts)
✓ Clearly addresses the significance of the work (1.5 pts)
✓ States what problems/questions the research addresses (1.5 pts)

Sample 1 MIBO3510 Student Journal Article Presentation Evaluation, students gave oral presentations on an article of their choosing. Students were graded using this rubric and additional feedback was provided.

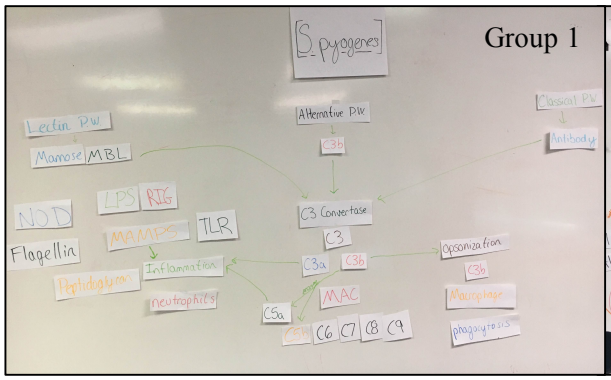
Health Care Microbiology (MIBO2500)

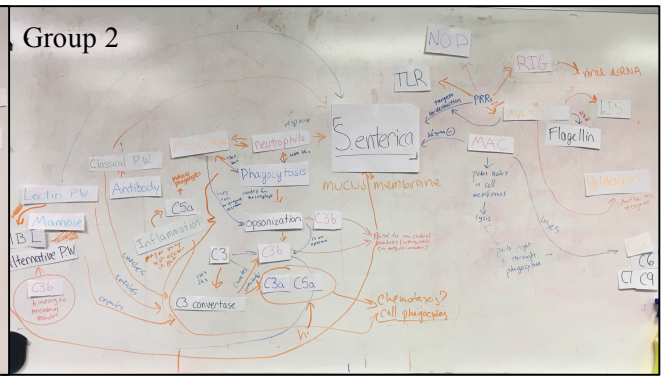
<u>In Class Learning Assignments</u>
During class lectures I break up lecturing by utilizing various active learning strategies such as concept maps, as shown in sample 2.

Sample 2 Groups of students were asked to create a concept map to make connections between various concepts and terms while learning about the innate immune response. Below are examples of the concept maps created by students.

Student Prompt: Using the terms given, and the bacteria provided, create a concept map connecting the various terms.

- Lay out all the terms on a table, start making connections (tape terms on board, draw arrows)
- Feel free to write in terms not provided (PPR, mucus membrane, etc.)
- Add phrases to go along with connections (binds to, recognizes, utilizes, etc.)
- More then one way to create a map!

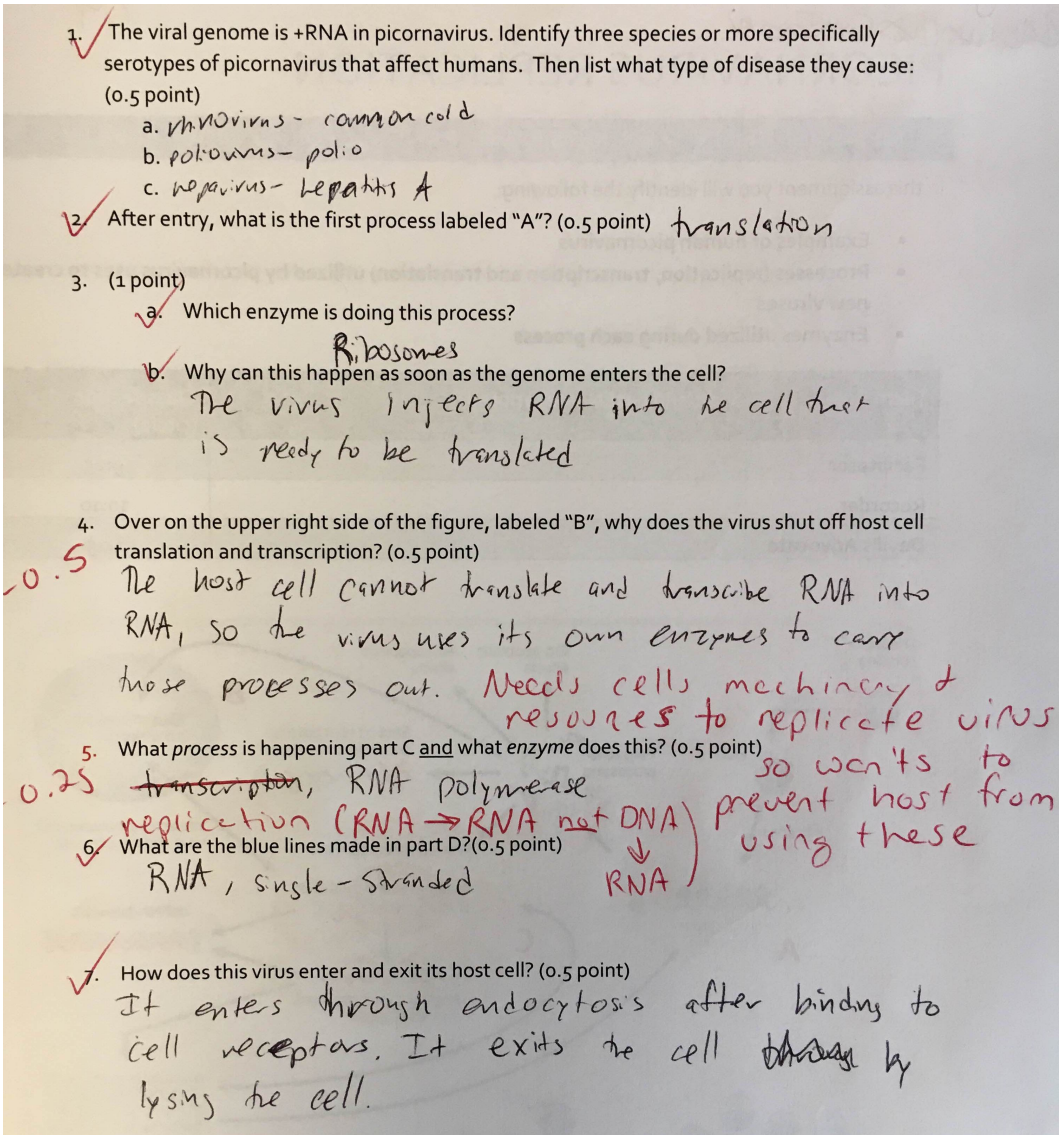




Friday Activities

Every Friday students completed a group assignment to promote critical thinking related to the material covered that week. Feedback was given to insure students understand the correct answer and reasoning behind the correct answer.

Sample 3 Picornovirus Group Activity with graded responses and feedback



1. The viral genome is +RNA in picornavirus. Identify three species or more specifically serotypes of picornavirus that affect humans. Then list what type of disease they cause: (0.5 point)
   a. rhinovirus - common cold
   b. poliovirus - polio
   c. hepatovirus - Hepatitis A
2. After entry, what is the first process labeled "A"? (0.5 point) translation
3. (1 point)
   a. Which enzyme is doing this process?
      Ribosomes
   b. Why can this happen as soon as the genome enters the cell?
      The virus injects RNA into the cell that is ready to be translated
4. Over on the upper right side of the figure, labeled "B", why does the virus shut off host cell translation and transcription? (0.5 point)
   -0.5 The host cell cannot translate and transcribe RNA into RNA, so the virus uses its own enzymes to carry those processes out. Needs cells machinery & resources to replicate virus so won't to prevent host from using these
5. What *process* is happening part C and what *enzyme* does this? (0.5 point)
   -0.25 ~~transcription~~, RNA polymerase
   replication (RNA → RNA not DNA → RNA)
6. What are the blue lines made in part D?(0.5 point)
   RNA, single-stranded
7. How does this virus enter and exit its host cell? (0.5 point)
   It enters through endocytosis after binding to cell receptors. It exits the cell ~~through~~ by lysing the cell.

Caitlin Reeves

In progress, anticipated completion of Fall 2017

I am working with Dr. Jennifer Walker to create a concept framework for the MIBO2500 Health Care Microbiology course to organize the material to enhance teaching and learning. The concept framework is a nested hierarchal organization that is based on relative importance, with the most important ideas serving as the core concept (Example 1). From the core concepts the course material is used to place details in context, nest related concepts, and articulate concepts that are obvious to experts but more difficult for novices to grasp. This organization of information will allow for better coordination between professors that teach the course and rely on the course as a prerequisite. By creating centralized topics to be covered as well as the important details that fall under these topics it is easier to insure that students are gaining the same knowledge, no matter which professor is teaching the course. The concept framework can then be used by other courses to provide information on what topics and knowledge students are gaining when they take this course as a prerequisite for a future course. Finally, the concept framework can also be adapted for use by students as a "study guide" or as an outline of learning objectives/expectations.

Example 1 Draft of MIBO2500 concept framework inventory for learning objective 1, subset 1.1

1 To describe the processes involved in bacterial growth and viral replication.

1.1. Microbial species have varying ranges of optimal growth temperature

1.1.1. Psychrophiles grow at ranges of -20 to 10°C

1.1.2. Psychrotrophs grow at ranges of 0 to 30°C

1.1.2.1. Bacterial species that are problematic in food spoilage at refrigerated temperatures

1.1.3. Mesophiles grow at ranges of 10 to 50°C

1.1.3.1. Classification of most bacterial species

1.1.3.2. Growth in humans and animals (body temperature 37°C)

1.1.4. Themorphiles grow at ranges of 40 to 70°C

1.1.5. Hyperthermophiles grow at ranges of 70 to 110°C

We will be utilizing this concept framework and doing pre and post surveys with the students in Fall 2017. The survyes will assess the effectiveness of the concept framework in helping students ot clearly understand learning expectations/objectives, make connections between various concepts, and improve studying/individual learning efforts.

Professional Activities Related to Teaching

Professional Teaching Training:
- Future Faculty Program Fellow, University of Georgia, Athens, GA 2016-2017

Awards:
- University of Georgia Outstanding Teaching Assistant Award, 2016

Pedagogy Coursework:
- EDHI9040: Using Technology in the College Classroom (3 credit hours), Spring 2016
- GRSC7900: Designing Courses for Significant Learning (3 credit hours), Fall 2014
- GRSC7770: Graduate Seminar on Teaching (3 credit hours), Fall 2012

Service to Undergraduate and Graduate Students:
- Graduate mentor for UGA Microbiology Undergraduate student, Krause Lab, Spring 2015-present
- Women in Science Mentoring Program, Undergraduate Mentor Fall 2016-present
- Mid-semester Formative Evaluations for Graduate Instructors, Facilitator, 2016-2017
- Women in Science Monthly Discussion Leader, August 2016-present
    - **"**Break free of the Echo Chamber-Science in the new administration" - December 6, 2016
    - "Hiding Behind a Mask-Imposter Syndrome" - October 32, 2016
    - "Women in Science- What can we do?" – September 21, 2016
- Women in Science "Fall Into Success" Workshop Series Co-Coordinator, Fall 2016
    - Online Presence Workshop – November 10, 2016
    - Funding Your Science Panel – October 25, 2016
    - Career Development Seminar – October 19, 2016

Professional Development:
- Interdisciplinary Certificate in University Teaching (*In progress)*, University of Georgia, Athens, GA, 2012-present
- Innovation in Teaching Conference, University of Georgia October 21, 2016
- CTL Speaker Series "Multimodal Teaching Methods: Meeting Students Where They Are" K. Paige Carmichael, Ph.D., October 26, 2016
- CTL Speaker Series "Varieties of Superior Memory: The Study of People Who Deliberately Memorize" Henry L. Roediger, September 12, 2016
- CTL Speaker Series "Metacognition: The Key to Accelerated Success for Graduate Students and Their Students" Saundra Yancy McGuire, Ph.D. August 29, 2016

Invited Speaker:
- University of Georgia Teaching Symposium, "Teaching with Technology" Workshop Coordinator and Presenter, Spring 2017
- University of Georgia Graduate School Teaching Assistant Orientation, Science Laboratory Teaching Assistant Session Facilitator, Fall 2016

Community Outreach:
- Malcolm Bridge Elementary School Visit, teaching 2nd Graders about Pathogens and Normal Flora, Fall 2016
- Peach State Louis Stokes Alliance for Minority Participation 10th Annual National Fall Symposium and Research Conference Judge, 2015
- Experience UGA Student Guide, 2014, 2015, 2016
- Georgia Science and Engineering Fair Junior Division Judge, 2014 & 2017