Bringing Examples to Life: Case Study Writing Assignment in Biochemistry

Kristy Wilson
Marian University - Indianapolis, kjwilson@marian.edu

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Case study teaching is a powerful way to introduce students not only to teach concepts and context, but also to critical thinking and problem solving skills. Cases bring context to life using examples and approaches that can interest students. Biochemistry students wrote short cases in groups to share with their classmates about protein structure function relationships utilizing a variety of models. Assignment will help students practice the following skills:

- Collaboration
- Information literacy
- Written and oral communication skills
- Application of structure and function relationship

**BACKGROUND**

Case study teaching is a powerful way to introduce students not only to teach concepts and context, but also to critical thinking and problem solving skills. Cases bring context to life using examples and approaches that can interest students. Biochemistry students wrote short cases in groups to share with their classmates about protein structure function relationships utilizing a variety of models. Assignment will help students practice the following skills:

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**SUPPORTING STUDENT CHOICE**

**Model Type & Definition**

- Diagrams: These depict interactions in a molecular system using a variety of models.
- Animations: Depict a dynamic visualization using images, video, or computer animation.
- Simulation: An animation of a real-world process or system. Simulations allow learners to manipulate variables or observe changes and make test predictions. Phenomena normally explored using simulations can be difficult to directly observe because of time or scale limitations.

**Extra Credit**

- Diagrams: 6
- Animations: 4
- Simulation: Up to 10 points
- Tactile models: 5

**Criteria to Receive Extra Credit**

- You would not need to make the simulation program yourself to receive extra credit. You could use internally created scripts or instructions.

**Tactile models: 5 models that can be handled by learners.**

- Up to 10 points
- You would not need to make the program to print the molecules. Either identify company to produce model for a reasonable price or use existing 3D printers to create the models. Students can simulate their protein and use tactile models to support students' visualization of models.

**SAFECOFFLED ASSIGNMENT PROCESS**

- Select topic, model, and approach using primary literature
- Draft learning objectives
- Draft case with answer key
- Revised case
- Case study presentation

**STUDENT FEEDBACK ON ASSIGNMENT**

**What is your most valuable aspect of writing and presenting a case?**

- "I learned how to think critically about the science behind the case and how to effectively communicate it to others." (Group 1)

**What changes would you recommend to the assignment or feedback to make assignment more effective?**

- "More feedback on the assignment would be helpful." (Group 2)

**What changes would you recommend to the presentation?**

- "More time for Q&A was helpful." (Group 3)

**Was your group effective in working together? Should part of the assignment include a peer evaluation?**

- "Our group was effective, but we should have been more collaborative." (Group 4)

**STUDENT SATISFACTION WITH ASSIGNMENT**

**Student Statement**

- "I was proud of the case my group wrote." (4.6)
- "I liked the choice of models." (4.8)
- "I would like to see a similar case study assignment in other classes." (3.5)
- "I use the value in the case study assignment." (4.4)
- "I did not understand the purpose of the case study assignment." (1.7)

**FUTURE DIRECTIONS**

One group has chosen to sign up for Independent Research in the Spring to revise case for submission to National Center for Case Study Teaching in Science. Steps for semesters to revise case, write teaching notes, teach case in Molecular Genetics course, submit, and revise case in response to peer review.

**CHANGES TO ASSIGNMENT**

- Add critical thinking and problem solving strategies in the context of biological phenomena.
- Add an opportunity for students to present their cases to a broader audience.
- Add more time for peer review and feedback.

**STUDENTS WRITE CASES IN OTHER COURSES**

Can be used across curriculum to bring life to content:

- Research a specific person in a historical event
- Rhetorical analysis of government health campaigns
- An artist's process to explain color theory
- Factual counseling session to illustrate psychological theory