BIOL 410 Making Assignment Description

BIOL 410: Principles and Methods of Teaching Biology is designed for future high school science teachers and aims to develop the knowledge and skills teachers need to implement student-centered and conceptually focused science instruction. The major project for the course is designing lessons for a topic in the biology curriculum that allows high school students to engage in student-centered and hands-on exploration.

Since much of the high school biology curriculum focuses on abstract biochemical and cellular topics, a central component of lesson design involves making models that allow students to envision and conceptualize the abstract components of your topic. Furthermore, the opportunity to focus the curriculum design around models will support greater emphasis on the value of curriculum that is more conceptual, haptic and interactive. Most students who take BIOL 410 have experienced the traditional approach to science instruction where the emphasis is on learning lots of terms and details and less about conceptually understanding the science behind real world experiences. Therefore, one of the goals of BIOL 410 is to support students in revisiting and revising their biology knowledge to make it more conceptual and connected to real world phenomena.

Working to design and Make a model that illustrates the essential science ideas of their topic will require students to strip away the many details and terms that are the typical focus of instruction and focus on the central concepts. Thus, this single Making assignment was central to the course and was the major project and out of class work for students for the majority of the semester.

In addition to supporting the students in creating hands on science curricula that supports deep understanding, the project is also connected to the service and outreach goals of the course and the larger UNC Baccalaureate Education in Science and Teaching (UNC-BEST) program. The models and accompanying curriculum BIOL 410 students create will be shared with an existing network of practicing teachers, including UNC-BEST alumni. The final class deliverable for the assignment was the physical models students created along with the curriculum that accompanied the models, which includes lesson plans and student worksheets that will guide teachers and students through examining and manipulating the models in ways that develop understandings of the real world topic that was the focus of the model.

The following learning objectives will be supported by Making-focused curriculum projects and accompanying models.

Students will be able to:

• Illustrate the central, unifying concepts of biology.

• Design hands on manipulative and/or models and accompanying curricula to support deeper understanding of biology among high school students.

• Integrate appropriate technology to enhance instruction in science.

• Design learning experiences that make the central concepts of biology accessible, meaningful and culturally relevant for diverse learners.

- Design developmentally appropriate strategies to deliver instruction in science.
- Apply best practice in science education and participate in the dissemination of those ideas.
- Foster relationships with practicing science teachers.
- Provide outreach, service and leadership to the science education community.