EDA 607: Learning and Teaching in the Biological Sciences II (3)

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The most exciting phrase to hear in science, the one that heralds new discoveries, is not “Eureka!” but rather, "hmm.... that's funny...."

- Issac Asimov

Biology is about life. Living in this world, we naturally have curiosity about life. How we live, how other organisms live, how living organisms live together, how lives on earth originate and develop, these are the types of questions people try to look into through different paths. As life science blooms, specific technologies and vocabularies are created (or borrowed), but still, the desire and the effort to make sense of various life-related phenomena is at the core. This class would continue focusing on the sense-making processes through attending to and refining your everyday thinking. As we construct, share and argue through ideas together, we will also reflect on this experience in terms of science learning and teaching practices in elementary classroom.

I Readings:

We will continue to draw some reading from Doing biology. And I hope to share some popular science writings as interesting ideas pop up. You are not required to purchase any book. If articles are assigned, they would be in electronic files or hard copy handouts.

These are possible resources of our readings:

II Learning process and goals:

In this course, we will try to make sense of biological phenomena and concepts as they interest us. This learning process can take form of scientific discussions, papers tracing scientific ideas and constructing scientific arguments, simple experiments can also be designed and conducted to facilitate our inquiry. We start with thinking about energy. It is a wide open topic and there are many different ways for inquiry to go from there. We are probably going to pursue ideas of energy in biological systems since this is a biology course, but there are lots of paths within that domain as well. And which ways to go are
choices left for the class, as it really depends on what kind of questions and ideas we put on the table, what we find intriguing and productive to look at. There is not a prior week-to-week calendar. The new topics, we hope, would emerge from the collaboration and collision of minds.

On this journey, we do also hope to encounter and examine some ideas that play essential roles shaping biology to how it is now. We don’t need to get to it painstakingly though. The connections between biological phenomena and ideas exist naturally and will be our leading momentum.

To make this journey a more meaningful one, we will frequently reflect as we go: what catches us at first; where our ideas come from, how our ideas bloom, conflict, build on each other and develop; what are the connections that lead us from one topic to another; etc, etc. Through such reflections, we hope to understand the approaches to explore new biological phenomena as an individual and as a class.

III Requirements and Grading

Assignments
There are several types of assignments we are thinking of using. No more than six assignments would be given in total. The actual use of these will be announced as we sense the need of them:

Argument-counterargument paper: This is the same type of assignment you have done in Dr. Levin’s class. It will continue to be an important part of homework for this class to “clearly articulate and reconcile between different perspectives.”

Idea tracing paper: When reading a science essay or encountering an interesting scientific phenomenon, we can use response paper to elaborate on the question or ideas it triggered, reason through them and think of possible ways of further investigations.

Learning reflection paper: We may have one such paper in the middle or by the end of the course. The purpose of it is to reflect on your learning experience in this class and pull out what you consider as essential for learning biology.

*In this class, an assignment announced in one class is due to Sunday afternoon before next class, so the instructors would have time to read it. Please post your paper on the class elms site on time. More instructions would be given on how to use this website.

Grading
Class participation counts 40% toward the final grade.
Written assignments count 60% toward the final grade.

IV University Policies
Religious Observance: The University System of Maryland policy "Assignments and Attendance on Dates of Religious Observance" provides that students should not be penalized because of observances of their religious beliefs; students shall be given an
opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances.

We are a diverse community and enroll students of many religions; pursuant to policy, we will do what we can when there are students' requests for excused absences and make-up test requests due to reasons of religious observances. It is the student's responsibility to inform the instructor of any intended absences for religious observances in advance. Notice should be provided as soon as possible but no later than the end of the schedule adjustment period.

Honor Code: The University is one of a small number of universities with a student-administered Code of Academic Integrity and an Honor Pledge. The Code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures. Students should write the following signed statement on the top of each examination or assignment: I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment).

Compliance with the code is administered by the Student Honor Council, which strives to promote a “community of trust” on the College Park campus.

Individual Needs Accommodation: The University is legally obligated to provide appropriate accommodations for students with documented disabilities. In order to ascertain what accommodations may need to be provided, students with disabilities should inform the instructors of their needs at the beginning of the semester. The instructor will then consult with Disability Support Services (314-7682). DSS will make arrangements with the student to determine and implement appropriate academic accommodations.

**Appendix: Content objectives (tentative)**

**Energy**
- Develop conceptual understanding of energy;
- Understanding the role of energy in multiple levels of life activities
- Understanding the connections between different forms of energy

**Ecology**
- How do populations and communities of organisms interact in ecosystems?
- How do changes in ecosystems affect populations and communities?
- How do matter and energy flow through the ecosystems?

The targeted underlying principles/models are:
- Energy as the overarching idea for understanding many biological phenomena.
- The hierarchical structure of organisms (cell, tissue, organ, system) and the relationships between structure and function at all levels of organization.
- The interrelationships and interactions among organisms in ecosystems.