Teaching Portfolio

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Teaching Philosophy

My approach to teaching revolves around the question: "What do I want my students to take away from this experience?" Teaching undergraduate biology courses, I know that some students might go onto graduate school and research careers, some will attend medical school, and many will never take another science course. I try to put myself in the shoes of different types of students and think about their goals and career paths. What knowledge, tools, mindsets, and experiences would be most useful for them during their college careers and beyond?

The most basic thing students should take away from a biology course is an understanding of core biological concepts. When learning biology, it is easy to get lost in a sea of terminology, details, and compartmentalized facts. With this in mind, I try to make students to take a step back, think about the big picture, and examine topics from unexpected angles. For example, in a lesson on biological energy capture, instead of diving into the steps of photosynthesis, I introduced students to recently discovered bacteria that live near hydrothermal vents on the ocean floor and use hydrogen as an energy source. Thinking about this unusual system forced students to consider at the most basic level how organisms capture and transform energy. Once the big picture is clear, specific facts and details fall into place and are retained more easily. I realize that students will eventually forget most of the details, but broad conceptual frameworks about how life works, and the thought processes that generate those frameworks, will stay with them.

Another key take-away for undergraduate biology students is a familiarity with the scientific literature. Reading primary journal articles lets students get as close to sources of scientific information as possible. Identifying and critically evaluating sources of information is one of the necessary skills for being a scientist, medical professional, or simply an informed member of society. I make teaching how to find, read, and discuss scientific papers—and putting these skills to use—a central part of the courses I teach. I have been surprised and encouraged by how quickly students begin to process and question even the most technical papers. What did the researchers do and why? What are the main findings? Are the conclusions convincing? Asking these types of questions is central to being an intellectually active and independent person.

Verbal communication skills are another tool I want students to take away from my courses. Being able to talk about complex ideas is an important tool for any career path, and I stress to students that this is a skill they need to actively practice and hone. To create opportunities to do so, I focus classes around discussions as much as possible. I have found that the key to generating good discussions is to ensure that students are comfortable and prepared. I achieve this by fostering a relaxed, encouraging atmosphere and having students write down thoughts, questions, and discussion points ahead of time. This gives students the confidence to overcome the initial fear of expressing their ideas out loud and opens the door for free-flowing and rewarding conversations.

Keeping students engaged, motivated, and on track to achieving educational goals is challenging. One strategy I employ is to assign frequent, low pressure assessments, such as short online quizzes and brief written responses to readings. These assignments keep students actively involved and thinking about ideas from class and provide opportunities for me to give feedback. While these tactics are useful, students must be self-motivated if they are going to make the most out of their education and future careers. Staying motivated is easiest when you are excited about the work you are doing, so I encourage students to explore the areas that excite them. For example, rather than assign readings, I often let students find papers that interest them and share what they found with the class. This typically generates more thinking and discussion than forcing students to digest what I find important or interesting.

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Education

2009-	Ph.D. in Biology expected May 2014, Syracuse University (Mark Ritchie and Jason Fridley, advisors)
2007	B.S. in Environmental Resource Management, Pennsylvania State University

Grants and fellowships

2012-2014	NSF Doctoral Dissertation Improvement Grant: "Community trait responses to environmental variation: assessing the roles of species turnover, genetic differentiation, and phenotypic plasticity". $13,769
2011-2014	NSF Graduate Research Fellowship. Project title: "Trait-based plant community assembly: incorporating space and intraspecific variation". $125,500

Research and professional experience

2009-	Future Professoriate Program, Syracuse University
2008-2009	Limnology Research Technician, Cornell Biol. Field Station, Bridgeport, NY
2008	Environmental Interpreter, Massachusetts Dept. of Conservation and Recreation
2005-2007	Stream Ecology Research Assistant, School of Forest Resources, Penn State University
2005	DOE Summer Undergraduate Laboratory Internship, Brookhaven National Laboratory, Upton, NY

Publications

Siefert, A., Ravenscroft, C., Weiser, M. and Swenson, N.G. 2013. Patterns of functional beta diversity reveal deterministic community assembly processes in eastern North American tree communities. *Global Ecology and Biogeography* 22:682-691.

Siefert, A. 2012. Incorporating intraspecific variation in tests of trait-based community assembly. *Oecologia* 170:767-775.

Siefert, A., Ravenscroft, C., *et al*. 2012. Scale dependence of vegetation-environment relationships: a meta-analysis of multivariate data. *Journal of Vegetation Science* 23: 942-951.

Siefert, A. 2012. Spatial patterns of functional divergence in old-field plant communities. *Oikos* 121:907-914.

Kattge, J. *et al*. 2011. TRY- a global database of plant traits. *Global Change Biology* 17: 2905-2935.

Carrick, H.J., Godwin, C.M., Johston-Greenwald, M., Rilk, C., **Siefert, A.**, and Tzilkowski, C.J. 2007. Evaluation of water quality in a spring fed stream based upon benthic algae and macroinvertebrates. *Journal of the Pennsylvania Academy of Sciences* 80:71-78.

Manuscripts in review/preparation:

Li, Y., **Siefert, A**., and Wang, G**.** Community assembly and intraspecific trait variability between and within populations in a subalpine meadow (in review, *Journal of Plant Ecology*).

Siefert, A. and Fridley, J.D. Community functional responses to soil and climate at multiple spatial scales: when does intraspecific variation matter? (in review, *PLOS ONE*).

Moles, A. *et al*. Which is a better predictor of plant traits: temperature or precipitation? (in review, *Journal of Vegetation Science*).

Siefert, A. et al. Global meta-analysis of the relative magnitude of intraspecific trait variation in plant communities (in preparation for *Ecology Letters*).

Siefert, A. and Lesser, M. Up the mountain, North to the pole: do species' elevational and latitudinal limits match? (in preparation for *Global Ecology and Biogeography*).

Selected presentations

Siefert, A., Fridley, J.D., and Ritchie, M.E. 2013. Variation in plant functional traits across a latitudinal gradient: does intraspecific variation matter? 11th INTECOL Congress, London, UK.

Siefert, A., Swenson, N.G., and Weiser, M. 2013. Scale dependence of vegetation-environment relationship: a case study on North American trees. International Biogeography Society Biennial Meeting, Miami, FL.

Siefert, A., Ravenscroft, C., Weiser, M. and Swenson, N.G. 2012. Patterns of functional beta diversity reveal deterministic assembly processes in North American tree communities. Ecological Society of America Annual Meeting, Portland, OR.

Siefert, A. 2011. Spatial patterns of functional diversity in old-field plant communities. Ecological Society of America Annual Meeting, Austin, TX.

Siefert. A. and Mills, E.M. 2009. Temperature and nutrients influence interannual variability of phytoplankton succession in Oneida Lake, NY. Great Lakes Research Consortium Annual Meeting, Syracuse, NY.

Siefert, A. and Carrick, H.J. 2007. Effects of fish in stream food webs. International Association of Great Lakes Research Annual Conference, University Park, PA.

Siefert, A. and Carrick, H.J. 2007. Top-down trophic interactions in a benthic stream community. Environmental Chemistry Student Symposium, Pennsylvania State University.

Siefert, A. and Green, T. 2005. Effects of changes in canopy cover on understory vegetation in the Long Island Pine Barrens. Pine Barrens Research Forum, Brookhaven, NY.

Siefert, A., Byrne, L., Bruns, M.A., and Kim, K.C. 2005. The communities within our communities: effects of urban landscape patterns on arthropods. Northeast Ecology and Evolution Conference, University Park, PA.

Awards and honors

2012	Best Poster Presentation, Syracuse University Life Sciences Symposium
2007	Best Undergraduate Oral Presentation, Penn State Environmental Chemistry Student Symposium
2007	2nd Place Poster in Health and Life Sciences, Penn State Undergraduate Research Exhibition

2006	Schreyer Honors College Summer Research Scholarship
2004	Dreibelbis Award for Excellence in Agriculture
2003-2007	Schreyer Honors College Academic Excellence Award
2003-2006	Gerald L. Bayles Memorial Scholarship

Teaching

2013	Exceptional Life (undergraduate seminar on "exceptions to the rules" across levels of biological organization), Syracuse University
2013	Guest lecturer, Multivariate Statistics (graduate), Syracuse University
2011	Teaching assistant, Integrative Biology (undergraduate lab), Syracuse University
2009-2011	Teach assistant, General Biology I & II (undergraduate lab), Syracuse University

Service and affiliations

2014	Organizer, working group on intraspecific trait variation in plant communities, Center for Functional and Evolutionary Ecology, Montpellier, France
2012-	Ad hoc reviewer for *Australian Journal of Botany*, *Ecography*, *Ecological Monographs*, *Ecosphere*, *Functional Ecology*, *Global Ecology and Biogeography*, *Journal of Vegetation Science*, *New Phytologist*, *Oecologia*, *Oikos*, *PLOS ONE*, *Methods in Ecology and Evolution*
2011-	Participant and data contributor, TRY Plant Trait Database
2010-	Member of Ecological Society of America, International Biogeography Society, International Association of Vegetation Science
2012-2013	Vice President, Biology Graduate Student Organization, Syracuse University
2009-2010	Presenter, Environmental Fields Days (program for Syracuse area 6th grade students), Green Lakes State Park, Fayetteville, NY

Bio 200: Exceptional Life

Spring 2013

Tues/Thurs, 3:30-4:25 PM, 156 LSC

Contact info

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441 LSC
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Overview

Biology has been called the science of exceptions. In this course, we'll find out why. Topics covered include strange, surprising, and remarkable biological phenomena ranging from molecules to ecosystems. Through exploration of these topics, we'll gain a better understanding and appreciation of the breadth of life on earth and approach core biological concepts from unique perspectives. The class is in a seminar format with an emphasis on critically reading and discussing the scientific literature.

Schedule*

Week 1: Introduction to "The Literature"

Week 2: What is life?

Week 3: Unusual building blocks: biological molecules

Week 4: The blueprint: genomes and genetic codes

Week 5: Information transfer: beyond the Central Dogma

Week 6: Energy transfer: beyond photosynthesis and respiration

Week 7: Strange cells

Week 8: Tangled tree of life: horizontal gene transfer and symbiosis

Week 9: Extremophiles

Week 10: Amazing adaptations

Week 11: Death… or not

Week 12: Biodiversity, part 1: evolutionary explosions

Week 13: Biodiversity, part 2: why so many species?

Week 14: Life as we don't know it

Grading*

Contribution to discussions: 30%

Paper notes/summaries: 30%

Weekly quizzes/exercises: 20%

Literature review: 20%

*Schedule and grading are subject to change based on the changing ideas and interests of the instructor and students.

Academic Integrity Statement

The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy see: http://academicintegrity.syr.edu

Disability Statement

Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 304 University Ave., Room 309 (315-443-4498). Students with authorized disability-related accommodations should provide a current Accommodation Authorization Letter from ODS to the instructor and review those accommodations with the instructor. Accommodations, such as exam administration, are not provided retroactively; therefore, planning for accommodations as early as possible is necessary. For further information see the ODS website: http://provost.syr.edu/provost/Units/academicprograms/DISABILITYSERVICES/index.aspx

Bio 200: Exceptional Life
Literature review assignment

Overview
For this assignment, I am asking you to write a brief review of the scientific literature on any topic in biology that interests you. The goals of the assignment are for you to gain an in-depth understanding of research on a particular topic and build your skills at conducting a literature search and scientific writing, including proper use of citations.

Grading
Papers will be graded out of 33 possible points based on the following rubric:

Component	What I'm looking for	Possible points
Format	- Paper follows the required format (see below)	3
Content and organization	- Title is clear and descriptive Introduction - Clearly defines the topic and establishes its importance and interest - Provides necessary background information - Clearly states the purpose/objectives of the review Literature review (i.e. main body of paper) - Clearly describes and discusses published scientific research related to the topic (what they did, what they found, what it means) - Information is logically organized into subsections with descriptive headings Discussion/conclusions - Summarizes the literature review - Puts previous research on the topic into some perspective (e.g. forms broad generalizations, discusses implications or applications, points out future research directions)	15
Citations	- Cites at least 10 peer-reviewed scientific journal articles - References are appropriately cited in text in the correct format - Reference list includes all cited references and is formatted correctly	10
Writing	- Writing is easy to understand and free of grammatical and spelling errors - Paragraphs include clear topic sentences, supporting sentences related to topic, and transitions - Scientific terms are defined and used appropriately	5

Format

Papers should be submitted via email (asiefert@syr.edu) as a Word or pdf file by Friday, May 10. The text should be double-spaced in size 12 standard font (e.g. Times New Roman, Arial). The review should consist of the following sections in the specified order:

- Title page, including title of the review and your name
- Body of paper, divided into sections with bold headings (e.g. "**Introduction"** or "**Conclusions"**), with references cited appropriately in the text (discussed below)
    - Minimum length: 1500 words
- Reference list in appropriate format (discussed below)

Citation guidelines

The main sources for the review should be *peer-reviewed scientific journal articles*, and a minimum of 10 such articles should be cited. These may include both primary research and review articles, but I would prefer an emphasis on the former. Additional sources, such as books and non-peer-reviewed magazines may also be used as references but do not count towards the 10.

All sources used in the review need to be properly cited, including in-text citations and a reference list at the end of the paper. Citations should follow the Council of Science Editors (CSE) style guide (posted on Blackboard).

In-text citations should include the author(s) and date of publication:

e.g. Genetic studies have show that at least 98.5% of the DNA sequences of humans and chimpanzees are the same (Gibbons 1998).

The reference list goes at the end of the paper under the heading "**References**". Entries should be listed alphabetically by first author and follow the CSE format. Here's an example of how a reference list would begin:

References

Abele D, Strahl J, Brey T, Philipp EER. 2008. Imperceptible senescence: ageing in the ocean quahog Arctica islandica. Free Radical Research 42:474–480.

Baker DJ, Wijshake T, Tchkonia T, LeBrasseur NK, Childs BG, Van de Sluis B, Kirkland JL, Van Deursen JM. 2011. Clearance of p16Ink4a-positive senescent cells delays ageing-associated disorders. Nature 479:232–236.

Boehm A, Khalturin K, Anton-Erxleben F, Hemmrich G, Klostermeier UC, Lopez-Quintero J, Oberg H, Puchert M, Rosenstiel P, Wittlieb J, et al. 2012. FoxO is a critical regulator of stem cell maintenance in immortal Hydra. Proceedings of the National Academy of Sciences USA 109:19697–19702.

Template for notes on journal articles

Citation:

Topic:

Key words:

Aim/Question/Hypothesis:

Methods:

Results:

Key points:

Context/significance:

References to follow up on:

Questions/comments:

Bio 121

Lab 4 Quiz

A paramecium is a small, unicellular protist that we will observe in lab today. It lives in fresh water, and it maintains a concentration of salts in its cytoplasm (inside the cell membrane) that is higher than the concentration of salts in the external environment. Answer the following questions based on this information.

1. The cytoplasm of the paramecium is _____ to the outside environment.

    a. hypertonic b. hypotonic c. isotonic d. hyperosmotic

2. Due to osmosis, water would tend to passively _____ the paramecium.

    a. diffuse out of b. diffuse into

3. To maintain the concentration gradient, the paramecium uses contractile vacuoles to actively _____ its body.

    a. pump water into b. pump salts out of c. pump water out of

True or false

4. **Eukaryotes** lack a nucleus and other membrane-bound organelles.

5. Plant and animal cells both contain mitochondria.

Sample student evaluations

Bio 121: General Biology I, Lab & Recitation

Fall 2010

Syracuse University
Teaching Assistant Student Rating
End of Semester Evaluation
Laboratory - Fall, 2010

Responses for TA: SIEFERT ANDREW Course: BIO121 Section: 026

The TA (or lab instructor):	Response:										Summary Stats.		
	1. Strongly Disagree		2. Disagree		3. Neutral		4. Agree		5. Strongly Agree				
	N	%	N	%	N	%	N	%	N	%	Total	Mean	StD
Question:													
1. prepares well for lab.	0	0.00	0	0.00	0	0.00	3	15.79	16	84.21	19	4.84	0.37
2. presents clearly and understandably.	0	0.00	0	0.00	0	0.00	4	21.05	15	78.95	19	4.79	0.42
3. presents materials in an organized fashion.	0	0.00	0	0.00	0	0.00	2	10.00	18	90.00	20	4.90	0.31
4. encourages questions.	0	0.00	0	0.00	1	5.00	4	20.00	15	75.00	20	4.70	0.57
5. satisfactorily answers questions.	0	0.00	0	0.00	0	0.00	4	20.00	16	80.00	20	4.80	0.41
6. thoroughly explains lab work/assignment expectation.	0	0.00	0	0.00	0	0.00	4	20.00	16	80.00	20	4.80	0.41
7. adequately explains use of lab equipment.	0	0.00	0	0.00	1	5.00	1	5.00	18	90.00	20	4.85	0.49
8. is concerned with lab safety.	0	0.00	0	0.00	0	0.00	4	20.00	16	80.00	20	4.80	0.41
9. demonstrates knowledge on the subject matter.	0	0.00	0	0.00	0	0.00	1	5.00	19	95.00	20	4.95	0.22
10. offers specific suggestions for improving weakness.	0	0.00	0	0.00	6	30.00	10	50.00	4	20.00	20	3.90	0.72
11. is available for office hours.	0	0.00	0	0.00	4	20.00	5	25.00	11	55.00	20	4.35	0.81
12. prepares lab assignments relevant to course objectives/lecture topics.	0	0.00	0	0.00	1	5.00	6	30.00	13	65.00	20	4.60	0.60
13. provides helpful feedback on lab assignments.	0	0.00	0	0.00	2	10.00	8	40.00	10	50.00	20	4.40	0.68
14. evaluates lab assignments fairly.	0	0.00	1	5.00	4	20.00	6	30.00	9	45.00	20	4.15	0.93

The TA (or lab instructor):	Response:										Summary Stats.		
	1. Strongly Disagree		2. Disagree		3. Neutral		4. Agree		5. Strongly Agree				
	N	%	N	%	N	%	N	%	N	%	Total	Mean	StD
Question:													
15. returns lab assignments promptly.	0	0.00	0	0.00	1	5.00	6	30.00	13	65.00	20	4.60	0.60
16. shows concern that you are learning the material.	0	0.00	0	0.00	1	5.00	9	45.00	10	50.00	20	4.45	0.60
17. shows enthusiasm for the subject and for teaching.	0	0.00	1	5.00	2	10.00	8	40.00	9	45.00	20	4.25	0.85
18. provides satisfactory educational experience in this lab.	0	0.00	0	0.00	0	0.00	8	40.00	12	60.00	20	4.60	0.50
Total	0	0.00	2	0.56	23	6.42	93	25.98	240	67.04	358	4.59	0.64