Teaching Portfolio

Luanna Prevost
Plant Biology
Spring 2009
As a teacher of plant biology, I have the opportunity to present science to students in a very practical manner. I use this opportunity to create an awareness and appreciation of the environment so as to encourage, students to think analytically and independently about science. I focus not only on the identification, evolutionary and ecological relationships of plants, but also the value and applications of plants in their daily lives. Growing up on a Caribbean island, I encountered plants daily - in the forest surrounding my home, the crops my father grew, and the herbs my grandmother used for cooking. Today, in my classroom I seek to convey these experiences and an appreciation for plants and the environment to my students, many of whom grew up in urban or suburban areas. At the beginning of each semester, I tackle what one of my undergraduate professors calls “plant blindness”, the unawareness of the plants in our daily lives. This lack of awareness extends to apathy for the environment and the services it provides to humans. Through my courses, students learn to value plants and the environment and the services they provide to the human community.

Once an atmosphere of interest has been created, students become more open to learning. I employ several activities that take into account their varying learning styles. Students take on the role of evolutionary biologists to experience how scientists conduct science. They examine the evolutionary relationships between plant groups using computer programs, debate findings based on data from different sources and identify future directions that can be taken to solidify their decisions. I incorporate field trips to allow students to encounter live plants both in natural and human-altered environments. This helps student experience plant characteristics first-hand. Group exercises, an essential part of most labs, stimulate discussion and interaction among students, and allow them learn from each other. During these exercises, I spend time with each group, asking and answering questions, and discussing the real-world application of the day’s topic. For example, while covering fruit morphology, I connect this to agricultural crops and the economic importance of fruit. Students are often amazed to learn that tomatoes and grains are fruit. I also encourage my students to draw and sketch to emphasize important characters. These hands-on activities allow students to pay attention to detail and make accurate observations, skills which plant biologists, and scientists in general, utilize daily.

I assess student learning through exams, quizzes and in-class activities. Each type of assessment incorporates questions that require not just recall about also application of techniques and concepts previously covered. Learning is assessed by defining, identifying and drawing plant characters and applying these skills to identify unknown plants. This ensures long term learning and not just memorization of facts. All these are solidified when students use what they have learned to identify and document plants for their collection.

Through these activities, students develop an awareness of the plants in their backyards, on campus, and on the roadsides. They begin to value the diversity of plant life and the role of plants in their lives. It is my goal that at end of the semester, students not only to have boarder knowledge of plants but develop a keen interest in examining plants and thus the natural world.
Course Descriptions

Botanical Illustration (PBIO4640L/6640L)
Role: Teaching Assistant
Semesters Taught: Fall 2008
Frequency of meetings: 1 section meeting twice a week
Enrollment & Student Profile: 8, undergraduate and graduate
Course Description: This course teaches students the basic of botanical illustration and also introduces them to plant morphology, botanical terminology, and illustration critiques.

Teaching Responsibilities: I instructed on plant morphology and botanical terminology. Students have hands-on experience with live plant material to become familiar with plant morphology and accurately illustrate these features. I also helped them gain skill in dissecting floral structures, understanding botanical terminology and interpreting scientific illustrations. I assisted students in learning basic illustration technique and also graded assignments.

Plant Taxonomy (PBIO4650L/6650L)
Role: Teaching Assistant, Lab Co-coordinator
Semesters Taught: Spring 2008; Spring 2009
Frequency of meetings: 1 section meeting twice a week
Enrollment & Student Profile: 10, undergraduate and graduate
Course Description: This lab allows students to actively learn about plant identification and botanical diversity. Students learn plant morphology, botanical terminology, how to use field guides and keys to identify plants.

Teaching Responsibilities: I introduced student to native and frequently encountered species by leading field trips & campus walks. I helped student master plant morphology, botanical terminology, and understanding evolutionary relationships among plants. I guided students through plant dissections, the use of field guides and keys for plant identification and preparing a plant collection, at the standard for herbarium submission and scientific documentation. I also served as coordinator, prepared both plant material and worksheets for labs, and graded assessments.

Principles of Plant Biology (PBIO 1210)
Role: Teaching Assistant, Guest Lecturer
Semester Taught: Fall 2007; Fall 2008 (Guest Lecturer)
Enrollment & Student Profile: 2 sections of 55 and 45 undergraduates
Course Description: In this course, students are introduced to the basic principles of biology with an emphasis on plants, including science as a process, cell biology, plant structure and function, genetics, evolution, and ecology.

Teaching Responsibilities: I graded assignments and exams for this large lecture class. I was also responsible for preparation and presentation of the Ecology section. I incorporated interactive clicker questions into my lecture to get feedback on students’ comprehension of the material presented. I also used small discussion groups to allow students to discuss material and tackle higher-order learning questions by applying concepts discussed in the lecture. I was invited to lecture again in Fall 2009.

Plant Ecology Seminar – Community Ecology (PBIO 8840 # 69-226)
Role: Co-Instructor
Semesters Taught: Spring 2009
Frequency of meetings: once per week
Enrollment & Student Profile: 7, graduate students
Course Description: Through this seminar, graduate students gain an overview of community ecology by reading and discussing classic and current literature.

Teaching Responsibilities: As Co-Instructor for this course, I selected material to be covered for half of the course, including discussion readings. I also selected background references for out of class readings as most students have little community ecology background. This course serves as an introduction for some students, as well as preparation for research and PhD qualifying exams. I assist students with preparation of presentations and field questions on ecology concepts and research methods.
Students were taken on a campus walk to identify conifer trees and their major morphological features. Below is a map of gymnosperm trees on south campus for student identification and revision.

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The handout below is used to introduce students to the parts of the flower. Students are first given an overview of the major floral parts. They then use this handout to examine a lily under the dissecting scope. Underlined terms are of great importance and students are asked to research these definitions and sketch these features. During this exercise, I take time to observe each student's sketches and answer questions and point out features that may not be easily seen by first-time observers.

**Plant Taxonomy Lab Spring ~ Floral Morphology I**

**Lab Assignment:**
Compose the floral formula (a) and draw the following flower parts (b–h) for the flower provided by your TA. Note any terms and questions with each part. Ask your TA for help as needed!

*Lilium (Liliaceae) – to refer to FAMILY drawing in Zomlefer*

**a. floral formula**
What is the symmetry of the flower?

**b. one outer tepal = petaloid sepal**
What do the sepals look like in a typical flower?

**c. one inner tepal = true petal**
What is the collective term for the tepals?

**d. stamen from bud = dorsifix fixed, versatile**

**e. pistil = stigma, style, and ovary**

**f. close-up of stigma – Note number of locules**
How many carpels are there?

**g. cross section of ovary – axile placentation. NOTE OVULES!!!!**
Can you see the number of carpels? What is the locule? What are ovules?

**h. longitudinal section of ovary showing position**
What is the ovary position?

**Goals:**
- Hands-on introduction to floral morphology!
- Introduction to Floral Formulas.
Examples of Student Work

Drawing and identifying floral structures are a key part to learning to recognize the key features used to identify plants. Students have several exercises where they draw and label key morphological structures. Below is an example of a graded assignment with comments to guide the student to the important feature that was missed.

Leaves can’t be both simple and compound, observe the nodes and buds in leaf axil.

Below are examples from a student’s plant collection. Students were asked to collect 50 flowering plants, key them out using flora guides for Georgia and the Carolinas. Each specimen is accompanied by a label (enlarged) as would voucher specimens for a scientific study. Labels describe the species, location found and specific characters of the plant.
I observed that students had a difficult time understanding the terminology of frond (fern-leaf) dissection and could not apply to new plants. I created a handout which diagrams the different types of dissection (on the right) and a worksheet (on the left) where students:

1) Examine live ferns that they have not encountered before, 
2) Classify or sort them according to dissection, and
3) Draw and label other key identifying features
This worksheet allowed students to learn fern identify while becoming familiar with dissection terminology.

**Fern Identification Worksheet**

This worksheet will help you to recognize some of the distinguishing morphological features of the ferns presented in lab and to identify these species in the future. Key features include **frond dissection, blade morphology and sporangia placement**. You may use this worksheet as a model for your study guide!

**INSTRUCTIONS:**
- In the space provided under each group of characters, indicate the species that exhibit(s) this morphology.
- If there are two or more species, how would you distinguish between them? Sketch and label a diagram of these features.
Species 1) is given as example.

**Ferns with once-dissected fronds:**
- Blade continuous on rachis:
  1) *Onoclea sensibilis* (Sensitive fern) - dimorphic fronds
  2)
  3)
- Blade interrupted on rachis:
  4)
  5)

**Ferns with twice-dissected fronds:**
- Blade continuous on rachilla
  6)
  7)
Professional Activities Related to Teaching

UGA Outstanding TA Award, Spring 2009

Course Design – Graduate Seminar in Ecology, Spring 2009
I was selected, along with one other graduate student in my department, to design and lead a graduate seminar in community ecology. We developed the curriculum to cover the foundations of the discipline and selected papers to stimulate discussion on recent developments in the field. This course provides a foundation in community ecology for graduate students in plant biology, ecology and genetics.

Mentoring
Through the UGA Graduate and Professional Scholars association (GAPS), I am currently a mentor for 8th grade young women through the Girls United Mentoring program at the Burney Harris Lyons Middle School in Athens, GA. We meet monthly with a group of 10 young women for personal and professional development activities, including discussions on college applications, peer pressure and self-image and self-awareness.

I served as a mentor for undergraduates in the SEEDS program of the Ecological Society of America. The goal of SEEDS is increase awareness of ecology and environmental science and related in underrepresented ethnic groups. I have mentored students at the 2005 and 2006 ESA Annual meeting, the largest national ecology conference.

I also served on panel for UGA graduate visiting undergraduates in the SEEDS program in November 2006.

Tutoring
I tutored at Fowler Elementary during the 2007-2008 academic year. Twice a week, I met with one to three students each in the 3rd, 4th, and 5th grades for tutoring in reading, math and language arts. The experience was very rewarding and I was pleased to see my 5th grade student receive the award for most improved in his grade.
Teaching, Mentoring and Training Experiences

Seminar in Teaching Biology (P BIO 8010) Spring 2009

This course is directed to students who want to pursue faculty jobs. I am developing a syllabus for a general ecology course for science majors, a course that I have a high probability of teaching as a new faculty member. We also develop a teaching activity that allows students to learn by-doing and apply that knowledge in forward-looking assessments. Through this course, I have the opportunity to observe different teaching styles of UGA faculty, as well as learn and discuss teaching pedagogy with other graduate students and faculty.

Special Teaching Projects in Plant Biology (P BIO 7510) Maymester 2007

I served as the instructor of record for the course “Plants and the Environment” a study abroad course in Costa Rica through the Coastal Georgia Community College. I designed an 8 week syllabus for the course ‘Plants and the Environment’. Students were able to enjoy hands-on learning while exploring Costa Rican plant communities from the mountains to the coast. I learned how to manage the students in a new environment and teach them, not only biology, but how to be open to new experiences and cultures. Teaching a course I would like to offer in the future as a university faculty-member was a very valuable experience.

Mentoring in Plant Biology (P BIO 7500) Summer 2006

I had the unique opportunity to serve as mentor to undergraduates in a research experience program in Costa Rica. The Native American and Pacific Islander Research Experience (NAPIRE) program is conducted by the Organization for Tropical Studies (OTS). With my advisor, I co-advised on student on her individual research program for approximately 6 weeks, working personally with her for 4 weeks when my advisor was not on site. We developed her experience design and I advised her on data collection and statistical analysis. I also served as a mentor for the other 8 women in the group. I led classes on statistical analysis and plant collection techniques. We also had individual meetings to discuss research, team-work issues that arose while students adapted to a new environment. This experience was rewarding as I got the opportunity to introduce other minority women to science and particularly research in ecology, a field where minority women are underrepresented.

Graduate Seminar (GRSC 7770) Fall 2005

Through this seminar, I learned how to effectively prepare and manage classes as a teaching assistant, including organizational skills. We focused on incorporating material for student with different learning styles. This was my first introduction to developing a teaching philosophy and helped me to take a more learning-centered approach to my courses. We also discussed the role of graduate students as mentors to the undergraduates in our courses and those working in our laboratories.
Evaluation of Teaching

Each question was rated on a scale of 1-5 with 1 being strongly agree and 5 strong disagree. Lower values indicate more positive responses.

<table>
<thead>
<tr>
<th>Category</th>
<th>Spring 08 Plant Tax</th>
<th>Fall 08 Botanical Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>The LA comes prepared to teach the lab each week</td>
<td>1.17</td>
<td>1.00</td>
</tr>
<tr>
<td>The LA communicates clearly and effectively</td>
<td>1.58</td>
<td>1.00</td>
</tr>
<tr>
<td>The LA is enthusiastic about the lab material</td>
<td>1.42</td>
<td>1.13</td>
</tr>
<tr>
<td>The LA encourages students to think for themselves</td>
<td>1.33</td>
<td>1.13</td>
</tr>
<tr>
<td>The LA grades quizzes and assignments fairly</td>
<td>1.92</td>
<td>1.00</td>
</tr>
<tr>
<td>The LA returns graded quizzes and assignments promptly</td>
<td>1.25</td>
<td>1.13</td>
</tr>
<tr>
<td>The LA is willing to help students with their questions or problems</td>
<td>1.17</td>
<td>1.00</td>
</tr>
<tr>
<td>The LA is approachable</td>
<td>1.17</td>
<td>1.00</td>
</tr>
<tr>
<td>The LA is a very good instructor</td>
<td>1.42</td>
<td>1.00</td>
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Qualitative student evaluation feedback

Knowledge of subject
- Luanna is very knowledgeable. It is clear she is very familiar with the subject and terminology. Unlike some T.A.’s / L.A.’s who prepare the night before class, it is evident Luanna clearly knew the subject matter. Also, Luanna interacts very well with the students.

Instructional delivery skills
- She explains the material very well and makes sure that students learn for themselves and helps them to understand the material.
- Make things easier to understand by relating new material to previous
- Provide information effectively – she’s very good at explaining things that are confusing and presenting information that we need, but she also tells us to look things up if it’s something we can figure out for ourselves.
- She makes sure that we understand the material before giving us more to take in. She explains thoroughly any questions we may have

Student Interaction
- Works with students to answer questions or address problems.
- Thoroughly covers the material that we’ll be tested on during the course of the semester. Also, she did an excellent job of helping us dissect and then identify plants that the class would have trouble working with under microscopes.

Concern for students
- Effectively communicates – listens well and describes answers well.
- Caring about the students and talking with them about class related interests.