STUDENTS TEACHING STUDENTS: HABITAT TOURS, AN OUTDOOR LAB EXERCISE

Thomas A. Davis
Department of Biology
Loras College
Dubuque, Iowa 52004-0178

The outdoor environment is not organized into chapters like a biology text. On a stroll through the woods, one does not encounter carbon atoms first, then proteins, then prokaryotes, and then eukaryotes with increasing complexity as one moves further into the woods. However, certain areas of the woods may contain organisms that are successful in that specific physical environment. These areas are called habitats and each has its representative plants and animals that live and reproduce successfully there (Kormondy, 1984). Recognizing the characteristic living components of different habitats (i.e., reading the landscape; Leopold, 1949) is one of the first steps in understanding how all life is interrelated. It is also one of the first steps in becoming better connected to the natural environment of which we are a part. But many times venturing outdoors into a world of ravenous mosquitoes, venomous snakes and glistening poison ivy can be literally traumatic for many students whether they are biology majors or not. How can we get students to be more comfortable in and better connected to the outdoor environment so they can relax, use their powers of observation and ultimately, start asking questions themselves about their natural surroundings?

One way is to get them outside more often. An effective method is an extended field class summer trip like Mountain Ecology (Davis, 1993). The students camp in the habitat that they are studying and become immersed in all aspects of that environment. Another method is to conduct outdoor field investigations either on campus or at a local natural area. But how can we get this outdoor experience to be user friendly? How can it be more interactive? How can we get the information that is learned to last longer and be applied later?

Recent studies on teaching strategies have shown that the best learning occurs when students are working in small groups on a specific task or specific question. (Angelo, 1993) These studies also say that information is retained longer when lectures are minimized and replaced with interactive learning sessions where students teach students (Angelo, 1993). The instructor acts as a coordinator, a mediator, a resource person, someone who fills in needed information. Students study a topic and explain the meaning of the concept to each other in their own words using analogies and examples from their everyday lives that make sense to them. This encourages student ownership of that information because they have spent time themselves figuring it out and listening to others explain the topic as well. (Roy, 1996; Angelo and Cross, 1993)

I have used this teaching strategy in several of my outdoor field ecology classes and in several outdoor laboratory sessions in my introductory biology class. In small groups the students read the landscape, observe the living components of the immediate natural environment and answer focus questions about that environment. There are two goals of these investigations. One is to introduce the students to the major plant and animal components of a specific habitat. The second is to use this awareness to reduce anxiety, stimulate appreciation and foster the ability to ask questions about their environment on their own. In this paper I will describe a simple outdoor lab exercise involving students giving tours of a particular habitat to fellow students.

Materials and Methods/Logistics

Prior to the investigation, students were given a brief description and summary of the habitat which they were to read. This summary gave the students an idea of what plants and animals to expect in this area. They were reminded that observations and information gained here will be used to compare with other life zones or habitats later.

Habitat tours—The class was divided into teams of 4 students. Each team was assigned a certain topic that they investigated. In my most
recent Mountain Ecology class, a two week camping trip that investigated and compared the living components in altitudinal life zones at several mountainside sites in Wyoming, 4 students were in a plant team and 4 students were in an animal team. Each member of the team was given a worksheet that contained specific questions for that team to answer (see box at right). Each team member had a notebook, a field guide for the area and binoculars. Each team was given 45 minutes to go out and investigate an area within 1/4 mile radius of the campsite or parking lot and focus on the questions answered on their sheets. They were asked to keep track in their notebooks of what they saw and questions that arose. They were encouraged to use their field guides and discuss with each other what they were seeing and hearing during their investigation time. Students were encouraged not to pick or sample flowers or vegetation and not to disturb animal signs so that the upcoming tour could see and learn about them later. Field guides that work well are those that include many pictures and descriptions of plants and animals in an area. An example would be the Audubon Nature Guide Series. I used a book called Western Forests by Whitney for my Mountain Ecology class.

When students returned from their group investigations, they took the other student team and the instructor on a tour of their surroundings. They tried to teach the other students about what they saw and other answers to questions from the worksheet. When one student team had completed their tour, the second student team took over. They showed the others what they had observed and learned from their investigation. Team members were kept the same but the assigned plant or animal emphasis was switched when a new habitat was visited.

Assessment
After each tour students were given time to write more in their notebooks about what they saw and learned. This time gave them a chance to look at the field guide and habitat description again. They were encouraged to include diagrams, sketches, personal comments and further questions that might be answered later.

After visits to 2 or 3 habitats, students gather with the instructor to begin talking about comparing 2 of the habitats. The instructor may start by giving a few examples of questions like why can’t Aspens survive in the Subalpine zone or why do yellow-bellied marmots get more gregarious as altitude increases? Students ask and answer many of their own questions during this session and, as a result, become knowledgable and more confident when it comes to write the required paper which compares the plant and animals communities of two
life zones. Students are then given more time to adjust and complete their notes. They are asked to write a statement about the effectiveness of these habitat tours as useful methods of learning about their natural surroundings.

Students hand in the comparison paper and their notebooks to be evaluated. A written exam on plant and animal identification and ecology is also given. They are graded on how well they answered the questions from the tour sheets, on adequate depth in writing about ecological topics that were discussed, on their exam performance and on their overall participation in the tours and discussions.

Disadvantages

The habitat tour technique may be limited to relatively small lab classes and the time it takes to run a tour for each team. Lab classes of twenty students may be the maximum working size. These classes could be divided into 4 or 5 teams. A 3 hour lab session would go by quickly if each team is given 30 minutes to investigate and twenty minutes each to give a tour.

Another approach would be to have the teams start their investigations during the initial lab period and revisit their areas 3 or more times during the upcoming week. This would help them become more familiar with the territory and the living components there. Maybe even one or more night visits could be required. Tours would be run during the next lab period.

It is difficult to get everyone participating in all the lab teams. It may be suggested that each team member must present at least two of the findings during the tour.

Conclusions

I have used habitat tours successfully in several of my outdoor class sessions. The tours get students talking to and teaching other students. They are truly learning from each other. In several groups there was disagreement about the identification of an insect or a flower. They started to question each other and criticize the identification logic that the other students were using. They had their field guides out and were paging back and forth comparing size, color, and predicted habitat. They were asking questions among themselves. They were taking ownership of the information that they were learning. They were becoming aware of, respectful of and better connected to their natural environment as a result of taking these habitat tours with their peers. In many cases students could not wait to go on the next tour to see what they could find. Take the initiative and push back the boundaries of biological education - have your students take you on some habitat tours.

Literature Cited


