

GER Guided Reflection on Student Learning  
ENT 203 – Introduction to the Honey Bee & Beekeeping  
Instructor – John T. Ambrose

**Course: ENT 203, Introduction to the Honey Bee & Beekeeping**

**GER Category: Natural Science**

**GER Objective #1:**

Provide instruction and guidance that help students to use the methods and processes of science in making hypotheses, solving problems, and making decisions.

**Outcome (for Objective #1):**

Students should be able to discuss the importance and economic value of honey bees, with emphasis on honey bee pollination of plants and the production of various bee products and their effects on the U.S. economy.

**Evaluation of the Outcome:**

Students will demonstrate their achievement of this outcome by preparing and delivering group presentations on the following topics:

1. The use of the word honey in the name of food and non-food items such as Honey Nut Cheerios.
2. The use of bee products in “Health Food Products”
3. The use of “buzz” words such as organic, natural, raw etc on honey labels.

For each specific topic students will be expected to address the following:

1. On the use of honey in product names – what is the manufacturer’s basis for the use of the word honey, does it affect the cost (to the consumer) of the product, does honey add to the nutritional value of the product, and is the honey the primary sweetener in the product?
2. On the use of bee products in health food products – how common in the practice based on a survey of retail merchants in the Raleigh area, what is the scientific basis for the use of the products, and what is the benefit to the consumer?
3. On the use of buzz words on honey labels – what is the manufacturer/producer’s reason for the use of the words, are there guidelines defining the use of the words, and what is the affect of such words on product cost to the consumer?

The students in the class were divided into groups and each group was assigned one of the above topics. A period of approximately one month was assigned for the researching and developing of each presentation. Course lectures relevant to the various topics were presented during the presentation development time. Group presentations on each topic were evaluated by a team (3 individuals) of outside examiners who used a rubric to assess each group’s delivery based on the points listed above. The same review team was used for all of the presentations.

### **Results for Outcome #1:**

Each group (3 groups with an n of 24) received at least a B (83-87%) grade on their presentations. In general the students did a good job of answering the questions associated with the various topics. They did a particularly good job on such questions as the manufacturer/producer's basis or reason for using the product or descriptive words, the cost to the consumer, and was honey the primary sweetener in food products that had honey in the product name.

Other questions were less clearly answered in the presentations. These questions included the scientific value of adding bee products to health food products, the availability of guidelines for the use of buzz words on honey labels, and to a lesser degree, the nutritional value of adding honey to a product. However, all of these questions were addressed to some degree. The difference between the set of questions that were less well answered and the first set is that the second set involved issues that are not clearly regulated or defined. Each student group did explain that the lack of such definition or regulation does make some of the product claims questionable and that consumers should be aware that not all claims can or must be substantiated.

### **GER Objective #2:**

Provide instruction and guidance to help students to articulate, make inferences from, and apply to solving problems, major concepts, principles, laws, and theories of science.

### **Outcome (for Objective #2)**

Students will be able to appraise the possibility and consequences of a potential problem involving honey bees such as the probability that Africanized honey bees (AHB's) will arrive in North Carolina and the consequences of such an occurrence.

### **Evaluation of the Outcome:**

Students will demonstrate their achievement of this outcome by preparing a three page research paper that addresses the following topics:

1. Based on such factors as your current knowledge of the distribution of the AHB's, the biology and behavior of the AHB and the already established European honey bee in N.C., and the geography and climate of N.C. do you think that AHB's will become established in this state in the near future (10 years or less) and why?
2. Assuming that the AHB's did become established in the state, what would be the consequences to agriculture and human health and safety based on your knowledge of the state's agricultural system and the AHB's biology and behavior?

### **Results for Outcome #2:**

The average grade on this paper was an A minus (92% based on 92 out of a 100 points for n=24). The grade was based on scoring rubric that evaluated the answers in the papers based on the student's ability to logically extrapolate possible outcomes from general

scientific hypotheses and known facts. For example, comparing North Carolina's geography and climate to areas that already have established AHB populations to determine if the bees could survive winters and summers in this state on an ongoing basis.

Overall students provided reasonable answers to all of the questions with the issue of AHB impact on human health and safety being the topic that was least well addressed. This was the one question where the student's general concern to the threat posed by stinging insects was most apparent and led to responses that were dictated by emotion as well as scientific principles. It was interesting to note that those students who had participated in an optional class demonstration that involved actually handling a swarm of ~15,000 honey bees were less influenced by personal feelings in their responses.

### **Improvements Made in the Course as a Result of This Process**

Overall I was very satisfied with this process and it has helped me to make changes to the course that I think will improve student learning and also student interest in the course. I had been using the group presentations as part of the course for the last several years, but this process helped me to focus the assignment. It also made me more aware of the students' limitations in dealing with issues (questions) that were not specifically addressed in class or some reference material such as guidelines (or the lack of guidelines) for labeling honey and food products that contain honey. Since this course is also a First Year Inquiry Course that is based on critical thinking, it alerted me to the fact that I should place more emphasis on gray areas where specific information is not available. Based on the Africanized Honey Bee papers I have also decided to make the class demonstration on handling a bee swarm a class requirement (except for students who are allergic to insect stings). This should help students to more closely match what they learn about bee behavior with the students' own feelings and biases about stinging insects. I plan to continue using the evaluation processes outlined here in my future teaching of the course.