



2007 AAAS/Subaru Essay Writing Competition for K-12 Educators, Finalist Essay



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Ethologist for a Day: Investigative Behavioral Study in the Zoo

High-school biology students are naturally curious about animals and their behaviors. Conducting an observational study of animals in the wild would be most inviting to many but it is not often feasible. The classroom constraints, medical, and safety issues hinder teachers from having animals in their classrooms.

In an informal learning environment, as in the zoo, biology students take charge of their learning where they reap the benefits of a nontraditional learning milieu. Teen learners capitalize on their social behaviors with student empowered activities. Field studies inspire these students to consolidate scientific concepts and investigative strategies in an exciting and enjoyable way.

Learner driven ethological study cultivates skills in analyzing natural animal behaviors. When students design a study, they identify components of animal behaviors, collect response data, and present these behavioral data and their inferences from field work. Unbolting students from the traditional classroom environment opens the floodgates to many ingenious and creative ideas about behavioral research. Each authentic investigation inspires students to merge the question of how and why animals behave in certain situations. Besides

identifying behavioral patterns and their processes, the study enhances observational research techniques. With increased social interaction amongst students, they accomplish curriculum and scientific inquiry goals while increasing ecological alertness (Van Oostveen, et al 2002, Ayyavoo 1999).

A class activity of this nature has numerous links to societal interactions. The rational is to bring into focus the observation of animal behavior, ecological awareness, and cultural beliefs in education.

Teaching and Learning Behavioral Research Techniques

When learning about animal behavior, it is important to view the interactions between the environment, resource management, and animal welfare. In a nontraditional learning environment, applying interdisciplinary and scientific inquiry skills increases the understanding of a larger conceptual context. Appropriately, students distinguish between correlational studies and experimental explorations as equally valuable research methods. Prior class lessons help to differentiate between the two different investigational styles. In experiments, the independent variable is changed to see the effect on another variable. In correlational studies, the associated variables are observed without manipulating them (Van Oostveen, et al 2002).

Supplementing didactic methods, videos and photos of animals' instinctive stereotypic behaviors are shared with the class. Learned behaviors include characteristics that are acquired through life experiences that occur in a particular situation(s). Imprinting, habituation, and conditioning are a few learned behaviors that are videotaped as evidence (Rise 2005).



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a) Students design authentic behavioral study

Students are offered the list of animals available at the local zoo. Their assignment is to develop an association between any two chosen animal behaviors. An example of a study is, "A comparative analysis of the play behavior between family members among the Orangutans and the lowland gorillas." Another study could be, "Analyzing foraging behavior of Meerkats and Prairie dogs."

b) Supporting student inquiry in a nontraditional setting

A two-week timeline is provided for students to research their chosen animals' predicted behavior in their natural environment. From the complex behavioral patterns, about 10 components of behavior are selected with respect to the topic. An exemplar is presented in class on the possible hypothesis and techniques, including a sample classification system. An example of this response classification system with unrelated responses is shown here.

Code & Component of Animal Behavior	Observable Response	Animal
R1:Feeding from the bottom dish	Focal animal eats from bottom dish.	
R2:Digging into the ground	Focal animal digs into the ground with forelimbs (hands).	
R3:Body Grooming	Focal animal combs its fur with hands or teeth.	

The second observational chart shows the recorded responses over a period of one hour. The response is recorded and prepared on this sheet before the trip. Both the classification system and

observational chart are approved by the teacher before the field trip.

c) Preparation before the trip

Students are reminded to bring their watches and writing materials for this observation. Prepared charts with the classification system expedite the behavioral recording. Digital still and video cameras are valuable support materials for the study. Any student allergies to animals are highlighted and made known through the permission forms prior to the trip.

'Ethologist for a day'

The study of animal behavior based on systematic observation, recording, and analysis is part of any ethologist's job description. The animal's behavior either individually or in cooperative group settings encourages one to focus his/her attention on physiological, ecological, and evolutionary aspects.

For this activity, paired student groups spend about four hours of observation time at the zoo. The students complete one of their observational tasks before and the other after lunch. The common lunch hour becomes a rendezvous point to discuss problems and issues with animal observation. With two chaperones, students' locations can be identified with prior knowledge of their observational schedules. After completing their task, they are encouraged to visit other exhibits and converse with zoo keepers. This freedom of time enables them to visit other animals that they enjoy.

Habitat evaluation & behavior analysis

A minimum of one hour is spent with each of the two animal settings. The longer their observation, the more productive their work becomes. During this time, students observe the animal's vicinity and record any special features in it. Working in a



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pair, students situate themselves where one will keep the 30-second interval time. The other partner will observe the selected behavior that might or might not occur within every 30 seconds. This is entered as a '✓' mark in their chart, allowing time to focus on the animal's responses.

Students analyze the animal's environment in which it is housed. The physical aspect, vegetation, climate density, condition, and materials in its surrounding also are observed and later discussed. Emphasizing the animal's habitat, single or group housing, is significant in studying behavior. In any modified zoo setting, it is important to assess an animal's indoor environment. The presence of enrichment toys, balls, swings, trunks, and artificial structures must be noted.

Class Forum: Oral Defense of behavioral observation

Students are given a week to analyze and interpret their data in a class forum. The assignment requirements include their thesis, evaluation of the animals' ecological environment, behavioral observation charts, and the graphical representation of their data. The study's significant findings are discussed with implications for animal security, its ecological importance, and the evolutionary significance of its behavioral repertoire.

Students present their papers to the class in a relaxed and enjoyable fashion. Photographic and video images are often presented. Evaluation of their oral presentation is performed with peer evaluation, fostering extrinsic value to the study. The compiled booklet with research theses, methods, observations, and discussions of their findings with the respective bibliography are handed in after their oral defense.

This ethological approach reconstructs students' understanding of natural animal behavior in terms of foraging patterns, reproductive courtships, territorial behaviors, cooperative behaviors, and patterns of communication. These are important animal conservative measures. A critical analysis of the animal's housing and significance of the animal's stimuli and behavior becomes a stepping stone to unraveling the complexities of investigating both animal and human behavior.

In conclusion, senior biology students satisfy two biology curriculum obligations. The first is for the Ministry/District. The second is for the Advance Placement biology goals in a nontraditional milieu by adding both intrinsic and extrinsic value to education. Students are exposed to interdisciplinary values with the investigation of animal behavior, environment, ecological, and evolutionary significance with ethical discussions. Supporting this sort of student-controlled investigative learning consolidates concepts and investigative scientific skills in an exciting and memorable way.

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