



Botany Segue: A Photo Essay

Valentina Savo, Y. Han Lau, Will C. McClatchey, David Reedy, Al Keali'i Chock, K.W. Bridges and Zak Ritchey

Research

Abstract

In the context of a class exercise, students enrolled in the Introductory Ethnobotany course at the University of Hawai'i at Manoa were asked to make up names for 40 fresh plant specimens avoiding the use of any previously known common names. One of the aims of this exercise was to collect data regarding the visual reaction of these students. The students came up with names that were related to shape, color and other morphological features of the plant specimens. An effective and meaningful way to understand the results collected from this exercise is to picture what these students actually did in class. Since images are a powerful way to express information, the method used in this exercise is presented here as a photo essay in the hope that researchers and instructors from other parts of the world can conduct similar class exercises with their students.

Introduction

A class exercise to introduce plant taxonomy and the concept of consensus techniques was conducted. This was done as part of the Botany Segue (Lau *et al.* 2009, Reedy in review) of our Introductory Ethnobotany course at the University of Hawai'i at Manoa in Fall 2008. The vast majority of these students were non science majors. As in previous years, a major goal of the Botany Segue was to expose these students to botany in ways that they can easily relate to and consequently have a better appreciation of the discipline. Nevertheless, we were able to collect enough data from this simple class exercise to understand how college students name and categorize plants in a classroom setting. Data collected in 2007 had been analyzed and written up for publication (Lau *et al.* 2009). Since Lau *et al.* 2009 has encouraged researchers from other parts of the world to conduct similar experiments and exchange data in the hopes of finding emerging trends on how students of different political and cultural

backgrounds assign names to plants and categories, we feel that this photo essay will provide a clearer picture on how the class exercise was conducted. In other words, the aim of this photo essay is to complement that publication by providing an alternative way to present the method used.

The class exercise

For the class exercise, forty plant specimens were presented to students who, in groups of three to five, had to give each of the forty plants a name of their desire. Each group was to discuss and reach a consensus on the name and not use already known names for the plants. In addition, students had to organize the plants into categories based on their own classification scheme using a standard card sorting exercise (Bernard 2000).

This is a simple class exercise and the value of the exercise is not so much about how good of a classification scheme the students can come up with but the actual taxonomic and nomenclatural process. From a research per-

Correspondence

Valentina Savo, Biology Department, Roma Tre University, Viale Marconi 446, (00146), Rome, ITALY.
vsavo@uniroma3.it

Y. Han Lau, W.C. McClatchey, D. Reedy, A.K. Chock, K.W. Bridges & Z. Ritchey, Department of Botany, University of Hawai'i at Manoa, 3190 Maile Way, 101, Honolulu, Hawai'i, U.S.A.

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spective, we wonder if students in Hawai'i who come from different cultural and knowledge backgrounds will exhibit similar patterns when it comes to naming and categorizing plants. At a larger scale, we wonder how similar or different students from Hawai'i are from those in North and South America, Africa, Asia or Europe. In principle, this is unlike methods used by different cultures to name and categorize plants in the field. We therefore present a photo essay on this simple class exercise in the hope that it will encourage researchers from other parts of the world to conduct a similar class exercise with their students.

The photo essay

Photographs can serve as a tool to assist other scientists and researchers to understand all the steps that are involved in conducting an experiment (Vogl-Lukasser & Vogl 2005). As it implies, we have prepared a set of photographs to help illustrate the key steps of the exercise. These photographs show the full working process of the exercise which would be very useful for other scientists and instructors who wish to conduct similar class exercises in the future. Moreover, photographs are noted as useful because they convey complex information and in the case of a photo essay, the photographs are not disjuncted from research context (McClatchey *et al.* 2005).

Informed consent was obtained from students who participated in this exercise. While photographs were also taken in 2007, none of those were used in this photo essay as we did not make provisions for explicit consent to use them for publication. All photographs were taken using a Canon EOS Rebel XSi camera with 18-55 mm lens when the exercise was being conducted. The photographs presented here were chosen to provide the most meaningful and logical explanation of the exercise with minimum accompanied text. Other than image cropping and resizing, the photographs have not been substantially modified.

Most of the plant specimens were collected from cultivated plants in the vicinity of the university campus (Figure 1) in order to ensure that the specimens were fresh. Certain fruits and vegetables (e.g. eggplant, potato) were purchased from nearby supermarkets. All of the plant materials, except for fruits and vegetables, were put in standard jars filled with water to keep the plants from dehydrating. A number was also assigned to each plant specimen.

The class exercise was conducted in a botany classroom at the university (Figure 2). Students were exposed to a colorful environment with pictures of plants and structures of plants on the walls (Figure 3) which served as additional visual stimuli for the students. The classroom environment is important as it has been shown that a positive



Figure 1. Fresh plant specimens were collected before the start of the class exercise.



Figure 2. The botany classroom where the class exercise was conducted.



Figure 3. Posters with botanical information are displayed on the walls in the classroom.

environment can have a positive effect on problem solving (Sinclair *et al.* 1998).

The plant specimens were arranged in the same exact configuration as in a prior semester in Fall 2007 (Figure 4). This was important in that it allowed us to maintain a certain level of consistency across semesters.

In general, local nomenclature of plant names is predominantly based on morphology, ecology (habitat), and functionality (Berlin *et al.* 1966, Berlin 1973, Ceuterick & Van Damme 2006). As such, a varied range of plant parts such as branches, leaves, flowers, fruits, and roots were used in the exercise. In addition, the plant specimens also exhibited a varied range of features such as scent, color and shape (Figure 5) which were distinctive features that students could easily distinguish. Students could therefore touch (Figure 6 and 7) or smell the specimens (Figure 8) as they decided on a name (Figures 9 and 10). However, as the experiment was conducted in a classroom setting, ecological information such as plant habit was not available to the students.

In the second part of the experiment students were instructed to sort the plant names into approximately 3 to 6 categories based on similarities and differences (Figures 11 to 13). The categorization process was perhaps the most demanding step of the whole exercise and different group behavior was observed at this point. Some groups showed somewhat equal cooperation among members while others clearly showed some kind of leadership emerging within the group (Figures 14 and 15). Nevertheless, it was clear that these different social patterns did not quite hinder the students from frequently using the noun-adjective combinations to name plants and monomial nouns to name categories (Lau *et al.* 2009). This naming process could potentially be compared to the social acceptance of a neologism as it is firstly used by an individual (or small group) and then becomes widely accepted even though the two processes may not be exactly the same. After the students were done categorizing the plant specimens (Figure 16), all data was consolidated and analyzed for patterns in ways that these students named and categorized plants. Lastly, all plant specimens were made into herbarium vouchers (Figure 17) and deposited at the University of Hawai'i Herbarium (HAW).



Figure 4. The plant species used were the same as those used in the Fall 2007 semester and were arranged in the same order as that semester.

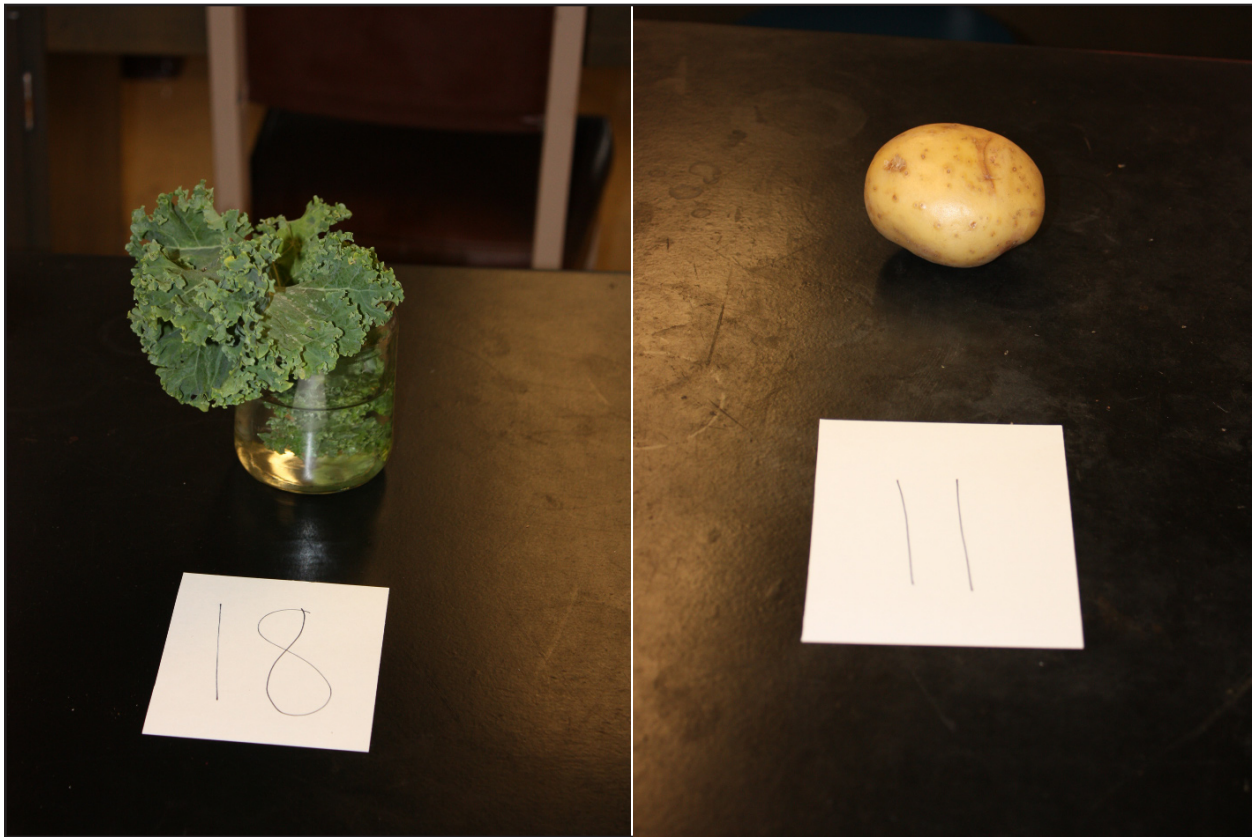


Figure 5. A varied range of features such as color and shape served as visual stimuli to the students.



Figure 6. A student experiences the texture of a leaf of a plant specimen.



Figure 7. A student explores the flower of a plant specimen while her partners observe.



Figure 8. A student smells a bowl full of aquatic plant specimen while his partner observes.



Figure 9. A group of enthusiastic students discuss and decide on a name for this plant specimen.



Figure 10. Students having fun coming up with names for the plant specimens.



Figure 11. The instructor of the class explains the card sorting exercise to a group of students.



Figure 12. Students categorize the plant specimens based on similarities and differences.



Figure 13. A student deep in thought as his partner sorts the plant names into different categories.



Figure 14. Different patterns of group behavior such as collaborative discussion occur during the card sorting exercise.



Figure 15. Some kind of leadership generally emerged within group the card sorting exercise.

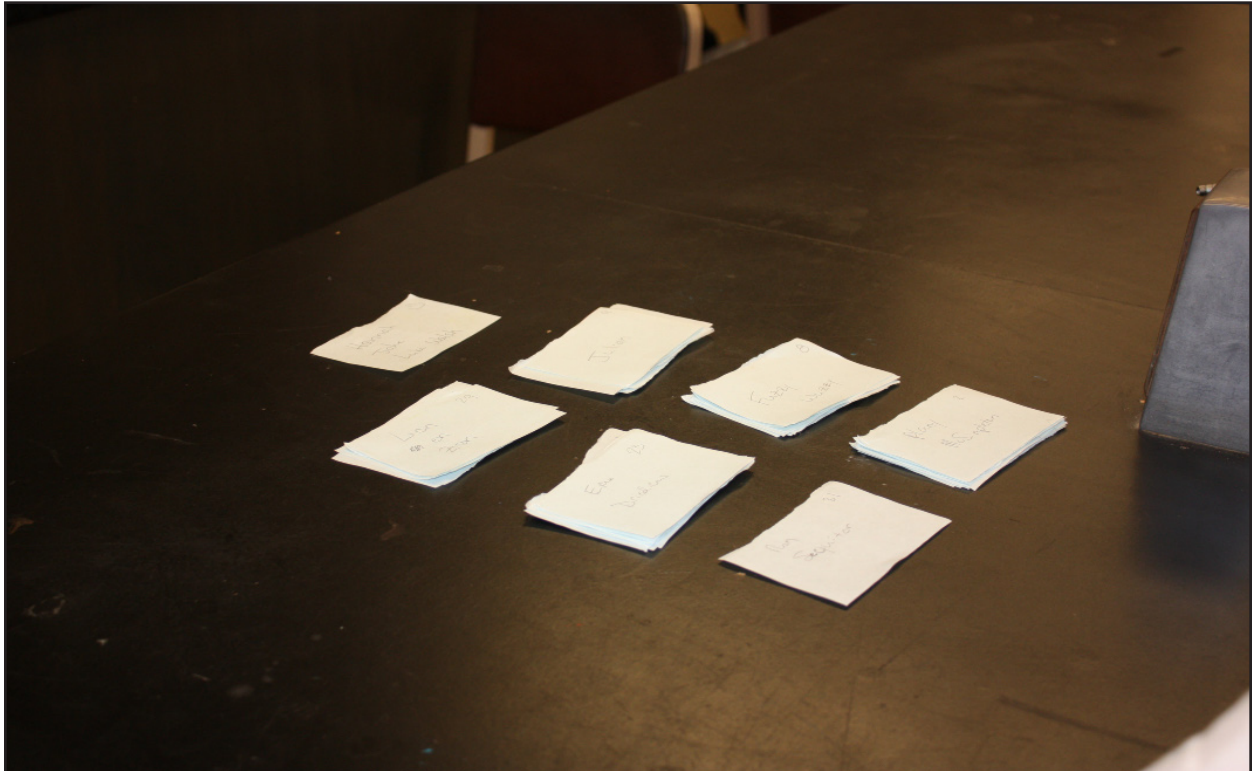


Figure 16. A completed card sorting exercise where each pile corresponds to a category.



Figure 17. A plant specimen that was made into a herbarium voucher to be deposited at the university of Hawai'i herbarium.

Conclusions

These photographs are not only explanatory of an ethnobotany class exercise but also serve to illustrate human reactions such as curiosity and interest in a creative botany exercise. The creativity of the students was stimulated through the naming and categorizing processes where they experienced the importance of highlighting distinctive or peculiar features at the plant name level and looked at similarity at the category level. In certain instances, a binomial system of an adjective and noun was used. This system is particularly evident when Hawaiian words were used since Hawaiian grammar has the noun first, followed by the modifying adjective. This experience is useful in the understanding of scientific nomenclature and concept of species and folk taxonomy. One important thing to note about the class exercise is that the plants were selected to include a wide range of texture, shapes and colors. As such, we recommend that researchers who are interested in conducting the same experiment to use the same plant species that we have used. In cases when a particular species is not available, another species bearing similar morphological characteristics may serve as a substitute. Lastly, one variation of this experiment may be to have the students identify the plants using names that past students have come up with over the years. This will provide us with further insights if students share similar thoughts.

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