

# Outdoor teaching

Pål Axel Olsson

**Abstract**— The aim of this study was to evaluate the students learning through an inquiry survey connected to the excursion and follow-up lecture course. Students were asked what they remembered from the excursion and from the follow-up classroom lecture, and how this connected to their different senses. The students considered almost only hearing and seeing to be involved in what they remembered from the lecture, while also touching, smelling and to some extent tasting contributed to what they remembered from the excursion. There were significant gender differences in that female students believed that touching and smelling contributed more to what they remembered than male students did. Overall the evaluation indicated that the spoken word during outdoor teaching should be focused to guide the other senses. Students often prefer interactive lectures and group-based activities and an excursion could very well be mixed up with group-based problem solving.

**Index Terms**—ecology, environment, gender, geology, landscape, outdoor

## I. INTRODUCTION

Impressions are important for all types of learning. When we experience something that is interesting, funny, shocking or beautiful we remember it better than things that leaves us without strong impressions. Outdoor teaching is a way to increase the impressions and the strength of impressions, and it can also be expected to involve more of our senses than common classroom teaching (1). Using more of the different senses seems to increase the ability of students to take in facts, and understand them in a broader context (2). At the same time we meet pedagogical challenges in clarity, learning transmission and focus. Things cannot be clarified in written word. An obstacle in outdoor teaching in ecology can be that very much of ecological processes and factors are explained through species distributions, and if the students don't know the species the teaching gets more difficult. The ability of students as well as among people in general to name plants has been decreasing (3,4).

The aim of this study was to evaluate the students learning through an inquiry survey connected to an excursion and follow-up lecture given in 2010. During the excursion we visit 5 places and we give rather much time for the students to be on their own without the guidance of teachers. We have organized walks, and then stop on pre-planned places where we gather everyone. There are numerous possibilities for the students to experience the nature with all their senses.

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## II. METHOD

The course moment investigated was an ecology/geology excursion for the Environmental Engineering program at Lund Technical University. During the time of the excursion the students followed one course in Terrestrial Ecology and one in Geology and the studied excursion was a joint venture where the geological map is used to explain vegetation structure, cultural history, soil properties and microbial life in the soil. The excursion was held by the teacher in the Geology Course (Conny Svensson) and me (one of the teachers on the Terrestrial Ecology course). The excursion has been given in a rather similar way for the last 10 years. Each year the students (usually around 60) are divided in two groups so that the excursion is given for around 30 students on two separate days. The excursion is mandatory. The year of this survey (2010) we had 67 students and all joined the excursion. A few days after the excursion, a lecture is given that explain and discuss the excursion. After the 2010 lecture the students were asked to fill out an inquiry, and they had not been told before the lecture that this was going to happen.

The inquiry had the following questions:

1. Your are man/woman?
2. Rate the contribution of each of your senses to what you remember from the excursion (as %)
3. Rate the contribution of each of your senses to what you remember from this lecture (as %)
4. Mention three things you learned during the excursion
5. Mention three impressions you remember particularly well from the excursion
6. How do you rate the tempo during the excursion (too high, appropriate, or too low)?

There were 54 students answering the inquiry (35 women, 17 men and 2 that did not give their gender). The inquiry was anonymous. The results of the inquiry are presented as means with error bars representing 95% confidence interval for question 2 and 3. Examples of the answers to questions 4 and 5 are given.

## III. RESULTS

In the inquiry of 2010, 53 out of 54 answered that the tempo of the excursion was appropriate, and only one considered the tempo to be too low. When students were asked what they learned they often described rather wide phenomena, such as: more about the geology of Skåne, agricultural history, acid litter, mycorrhiza, connections between geology and vegetation and structure of a heath. When they were asked about their impression they were much more concrete, and

then they also mentioned things outside the general topic of the course. Examples of impression were: seeing a salamander, nice place, Connys digging, the cold water, broken window of the bus, beautiful landscape, the sea view, Conny eating peat/dirt, jumping on a bog and the taste of cranberries. The beauty of the landscape was mentioned by many. Also, many remembered the feeling of walking on a peat bog.

The inquiry showed that the students estimated that all their senses contributed to what was remembered from the excursion (Fig 1a). This was in strong contrast to the lecture where they estimated that hearing contributed the most, followed by seeing, while only two people claimed that any other of their senses (touching) contributed to what they remembered from the lecture.

Seeing contributed equally in excursion and lecture while hearing contributed much lower in the excursion than in the lecture, and was replaced by memories of touching, smelling and tasting. The comparison between male and female students showed that women claimed that touching and smelling contributed to what they remembered, more than men did (Fig. 1b). For the rest there were no significant differences.

#### IV. DISCUSSION

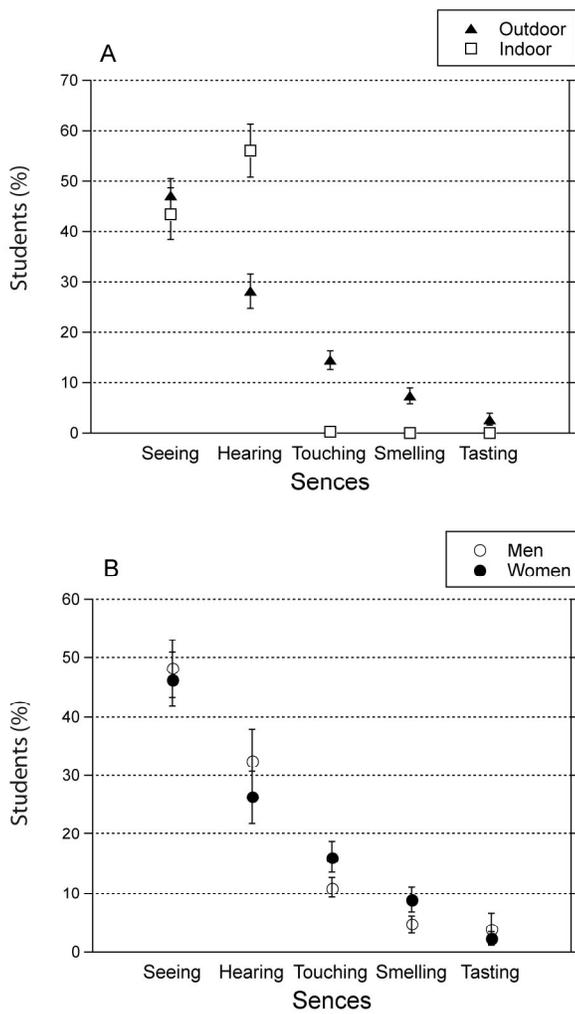
The results of this study show that the hearing on outdoor teaching has less of impact and could thus be reduced and thereby leaving more time for the students to experience with other senses. It seems clear that the students used less of their focus on hearing when they were on excursion, and thus had more of focus to spend on other senses.

Outdoor teaching can be developed much further and complemented with interactive environments on the web (5,6). It has been shown that students often prefer interactive lectures and group-based activities (7), and the type of excursion described here could very well be mixed up with group-based problem solving. The importance of naming organisms and phenomenon that are observed in the nature is essential for communication and for a deeper understanding of the processes that rule our environment (8). This is, however, difficult to communicate in the field and complementary indoor activities are needed.

Although there may be a problem with less knowing about names on plants and animals (3), others have shown that undergraduates with little botanical background can, with only little introduction to aiding device, do precise work on describing vegetation (9). This is encouraging and also hints about the great potential of using interactive web-based environments. By learning about key species, students can relate abstract processes back to the organisms (8) and thus reach the "Extended abstract" level in the SOLO taxonomy (10) and learned facts can be generalised to other ecosystems.

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**Fig. 1.** Results from questions 2 and 3 of the inquiry given as percentage of the each population. A: Comparison between outdoor and indoor teaching in how the students estimated of the contribution of their senses to what they remembered (means  $\pm$  confidence interval, n=54), B: Comparison between female and male students in how the students estimated of the contribution of their senses to what they remembered from outdoor teaching (means  $\pm$  confidence interval, n=35 for women, n=15 for men).