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A Different Approach to Teaching Forestry

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Abstract. This paper is the result of an experiment which took place at the University of Agricultural Sciences and Veterinary Medicine of Cluj with forestry teaching staff, when giving scientific explanations. The most memorable professors have always been those who did more than teach the subject matter of some discipline. They espoused an underlying theme that established a perspective or framework within which to structure the details of the subject being taught. This paper describes a theme that reveals the structure of certain scientific explanations relevant to a study of forestry. Because our suggestion emphasizes research explanations that belong to the field of forestry, it helps a student distinguish a sensible explanation from one that is not. The paper is intended to provide an example of a theme for an introduction to forestry that we have found useful. It is neither the only possible theme nor necessarily the best, but it does demonstrate what a "theme in a science course" means to us. Hopefully its usefulness will be apparent to the students. Some of the main results of our attempt are as follows: integration and implementation of the research in question into the teaching practice; breaking the psychological barriers such as fear of change and failure in new endeavours; resistance to changing one's teaching philosophy from a traditional to a more alternative mode of practice. The members of the teaching staff improved their teaching technique and students enjoyed a different way of acquiring knowledge.

Keywords: science, education, research, teaching method, cognition, alternative

INTRODUCTION

This paper is the result of an experiment which took place at the University of Agricultural Sciences and Veterinary Medicine of Cluj with students of forestry, when they were given scientific explanations. The most memorable professors have always been those who did more than teach the subject matter of some discipline. They espoused an underlying theme that established a perspective or framework within which to structure the details of the subject being taught. This has been, along the last decades, the concern of many teaching teams, who tried to find fit approaches for making students work and research in an enjoyable manner.

In the 1970's and the 1980's, this attempt was quite shy (Bower, 1986), trying to introduce research elements into teaching, but in a very theoretical way (Kothari, 1986). As the methodology of teaching progressed, more experiments came out, proving that such approaches were reasonable and effective with a devoted participation on the part of the students. As Peter McPhee points out, „across much of the globe, the world of teaching and learning in higher education is being shaped by various phenomena: a larger, more demanding and more diverse student body, a pervasive language of quality and accountability, rapidly changing technological possibilities yet uneven levels of student familiarity with them, and expectations by students and employers that graduates will be equipped for rapidly changing and globalising workplaces" (Fry, 2009).

This paper describes a theme that reveals the structure of certain scientific explanations relevant to a different approach in the study of forestry. Because our suggestion emphasizes research explanations that belong to the field of forestry, it usually helps a student distinguish a sensible explanation from one that is not. The paper is intended to provide an example of a theme for an introduction to forestry that we have found useful. It is neither the only possible theme nor necessarily the best, but it does demonstrate what a "theme in a science course" means to us. Hopefully its usefulness will be apparent to the students.

MATERIALS AND METHODS

At the beginning of any forestry course, the students seem more attracted by field work, miracles of nature, environmental areas that are inhabited by particular species of animals, plants, or other types of organisms. Attending the course is a mere obligation and research seems a far-away target. Gradually, several key elements, meant to make students more and more eager to extend the information, are introduced into the course (Schiering, Bogner and Holmberg, 2011). They attend the course with a gradual increase of attention and interest and, at one moment, they even ask for more information (Rider, Hasselberg, Waluszewski, 2013). This is a key point, where the students' research starts. The first source of information preferred by students is obviously the Internet, but they must be helped to become aware of the fact that this is sometimes, an approximate source (Tanner, Chatman, and Allen, 2003). Guided by the teaching staff, they begin to get information from more thorough sorces like: Bachelor, Master and Ph.D. theses, easily accesible national journals and magazines, international journals. Of all these, the local and national sources are preferred „Bulletin of UASVM Cluj-Napoca, Horticulture"; „Agricultura"; „Transilvania" - a plant protection journal; „Silviculture and Cinegetics Review"; "Bucovina Forestieră"; "Analele Universităţii «Ştefan cel Mare» din Suceava – Silvicultură"; „Revista pădurilor"; „Diana"- journal for hunting. If taken gradually and rationally, under the guidance of the teaching staff, all these sources, combined with the theoretical knowledge acquired during the course and with the abilities and information gained during the practical activities, lead the student to a macroview of the facts and phenomena studied. Their understanding requires a thorough knowledge of educational principles and concepts under the guidance of a research group leader. Dissemination of results in a fit scientific environment and their publication in scientific articles, published in scientific journals, represent a step forward in the development of a student as a good future engineer or scientist.

According to Ross, „a thematic relation is a temporal, spatial, causal, or functional relation between things that perform complementary roles in the same scenario or event. For example, cows and milk are related by a production theme, and sails and anchors are related via a boating theme. Thematic relations are distinct from mere associations, scripts, and ad hoc categories. They also contrast and complement taxonomic (categorical) relations such as "fruits" and "furniture." Thematic relations and taxonomic relations arise from distinct processes, as evidenced by numerous neuropsychological and behavioral dissociations. Thematic relations may be apprehended uncontrollably and rapidly according to how frequently and recently they have been encountered. They exert profound effects on many core cognitive processes, including similarity, categorization, memory, language, inference, and analogy, and they exhibit robust processing differences across individuals and cultures. In sum, without such thematic thinking, models of cognition will remain categorically limited" (Ross, 2011). Similarly, we developed experiments with interested students, starting from very simple elements in the field, forest, and getting to the clear understanding of distinct processes and phenomena, which take place in nature, in the habitats we are interested in. The

teaching staff research group leader will have in view cognitive processes like similarity, categorization, inference, analogy, which help the student progress, without a significant effort, from mere observation to the level of research remarks.

RESULTS AND DISCUSSIONS

The experiment in question, had 3rd year students and Master students as target groups, attending the courses mentioned in Tab. 1. The increase of students' involvment was gradual but steady and the results were beyond expectations. They are registered in Tab. 1.

Tab. 1

Students involved in research activities

No	Subject matter	No of students - October	No of students - February	No of students - June
1	Forestry afforestation and monitoring	7	20	46
2	Forestry certification	5	12	19
3	Forestry ecosystems management	3	10	15
4	Forestry cultures for hunting purposes	8	12	15
5	Installation technologies for agroforestry cultures	6	11	17

The main results of the experiment are connected with the characteristics of the target group; this involves a previous minute case study for most students implied. Some of the consequences of this experiment are connected with the integration and implementation of the research in question into the teaching practice, breaking the psychological barriers such as fear of change and failure in new endeavours, resistance to changing one's teaching philosophy from a traditional to a more alternative mode of practice.

Undergraduate students in forestry have the opportunity to participate in the Afforestation Circle; in this framework they take part in various actions like: planting seedlings in nurseries; maintaining the cultures from the planting areas of Baciu; preparing the soil for seedling plantations; gathering data from forestry monitoring networks; performing identification and research activities for special value trees from Cluj-Napoca; caretaking and completing the seed and fruit collection of the Afforestation Laboratory; conceiving a handbook and a calendar about the work in the planting areas; offering consulting to volunteers in the afforestation campaign; taking part in radio and television broadcasting, meant to promote a correct civic and forestry attitude among the population. Talking about urban trees students suggest services, which they could do for the aesthetics of the city and for the health of the population. They notice that the city life is tough for trees: droughts and compacted soil keep water from reaching roots, canine waste can burn tree bark, growing spaces are small, and trees are even physically vandalized. They suggest volunteering for the maintenance, health, and longevity of urban trees, which would help the city make the most out of its green spaces.

This experiment has above all a research target, but it is also a civic engagement project that addresses the needs of our community, provides opportunities for change, and plays a role in the personal development of any young person involved. The students and their program advisers involved in this experiment design a civic engagement project that addresses a need, provides an opportunity for change and plays a role in addressing some

professional and personal concern. The experiment is meant to outreach a program, that builds social and community awareness among the students.

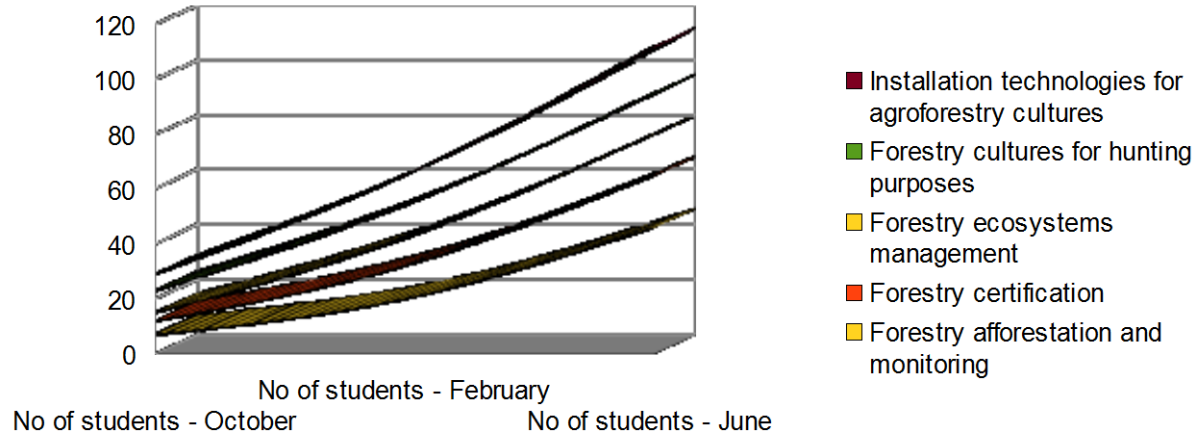

Fig. 1. The involvement of students in research activities

The figure above shows the students' involvement in three key periods of the academic year and points to the obvious increase of the students' participation. Both undergraduate and graduate students considered the experiment period not just a mere activity, but an opportunity to improve themselves as professionals and as citizens.

CONCLUSION

The importance of this paper lies in the fact that it furnishes methods for introducing the elementary notions of research, necessary to any student. The target group involvement in the experiment was meaningful and consistent; it was a process of implying the students in every facet of the educational process for the purpose of strengthening their committment to education and community. The students got used to the democratic impulse in forest management by incorporating civic engagement into forest planning and policy development. Civic engagement encompasses a wide range of activities from public meetings to advisory committees of the Forestry Directory. It is an opportunity for both teaching staff and students to reflect and assess the state of forest maintenance, as it relates in particular to the role of local and non-local inhabitants in the process of forest management. Data gathering and evaluation of civic engagement is important to improve efforts, develop guidelines for resource managers and identify the strength and limits of civic engagement, as it is currently practiced across Romania. The members of the teaching staff improved their teaching technique and students enjoyed a different way of acquiring knowledge.

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