Teaching Tips/Notes

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Motivation for Class Team Projects in Agroecology: Potentials for Super Teams

Creating high levels of motivation for class team projects involves assurance that individual contributions will be recognized, thoughtful design of ground rules, and convincing students about the long-term value of the exercise for future employment. Various methods have been used to identify individual as well as team contributions, in response to student concerns. The importance of setting up clear norms for teams to follow have been explained (Patterson et al., 2005), and general teamwork challenges thoughtfully summarized in a review by Whatley (2009). We have tested several team project models including imbedding instructors and teaching assistants in the teams [highly time-consuming], providing in-class time for some team meetings [valuable strategy], and grading both individual sections and overall team reports [current method in Agroecology at UNL]. In this teaching tip we provide record of a highly successful "super team," composed of the Agroecology course instructor, the seminar's graduate teaching assistant, and three highly motivated undergraduate students. Together the super team embraced the challenge of exploring systems learning in Agroecology, and the value of an interdisciplinary team perspective to students, faculty, and future employers.

Learning objectives for team projects include preparing students for future positions in industry, government, NGOs, and academia; helping students better appreciate their personal strengths in a team situation; and honing communication skills including the abilities to discuss and compromise when there are differences of opinion on how to proceed with a task. When recruiters from agriculture and food industry companies visit campus interviewing potential new employees, it is noteworthy that they assume a certain level of technical competence and question students about their experience in team building and participation, their communication skills, and their potential to address the public with confidence about environmental and social issues. For this reason many instructors include team project activities as an essential component of courses, especially at the senior level and in capstone experiences.

Methods for introducing and conducting team project activities in this course have evolved through instructor experience and in response to student evaluations. Long-concerned that students were not totally motivated in team projects in the conventional course setting, we have been searching for alternatives. In the 2003 Agroecology course at UNL, four students responded in highly creative ways to a mid-term question about the importance and potential consequences of successful interdisciplinary approaches to education. In response, we invited the students to join a small study group to further explore the topic outside of class, together with the instructor and teaching assistant, and develop a manuscript for publication based on their research findings.

The immediate reward was to submit their team draft in place of the second mid-term exam, while the long-term incentive was the potential for an in-depth team research experience in an area of mutual concern, with the potential for a publication, something recognized as important by the graduate student team member and undergrads who were considering further academic degree programs. We were inspired by the model used by Prof. David Pimentel at Cornell Univ., who convened a select group of undergrad and grad students each year in a seminar designed to explore a topic of contemporary and critical interest to society and to create a journal article produced by the team (for example, Pimentel et al., 1994).

Our five-person team met throughout the semester on campus or at the instructor's home, developed an outline of important topics, and decided on a division and distribution of labor. During preliminary discussions and telling our individual stories, it became apparent that each of us had taken different paths to arrive at an awareness of the importance of interdisciplinary research and thinking. An early activity was to each write a short synopsis of this experience to share with the others. We also recognized that one of the prime motivators for our undergraduate students during their final year of study was potential to successfully interview and enter the job market. We needed to know how valuable they considered courses from a range of disciplines, and thus how important team projects would be as motivators for systems studies.

It was also important to learn from faculty who were undergraduate advisors what importance they put on an interdisciplinary undergraduate experience, since they were the people directing students toward specialization or generalization in their course choices. Lastly, we needed to quantify, if possible, the criteria that companies were using in their interviews and review of credentials of our graduates with respect to an interdisciplinary focus of their studies. We designed three questionnaires for the groups – students, faculty advisors, industry personnel specialists and recruiters – to see if their opinions differed on the value of a broad, systems-oriented undergraduate education. The results of the local surveys confirmed much of what we read about interdisciplinary education, and provided some justification to continue to use team projects as an important component of Agroecology courses.

Outcomes of the team research, information evaluation, and synthesis included two manuscripts for potential publication. In one paper, we outlined our different routes to appreciating the importance of a broad perspective in education. One team member studied philosophy for three years, changed to environmental ethics, then to horticulture, and finally studied agronomy with a specialization in ethics of land use and potentials for diversification of peri-urban food production. Another began in chemical engineering, changed to biological systems engineering, and then settled in agronomy to prepare for a future career in farming and the ag industry. A third team member studied agronomy from the start, with a second major in international studies to prepare for development work. Another team member knew during the first two semesters that environmental studies was not broad enough, thus used an available option to create an individualized program of study that included sociology, political science, and development in addition to environmental specialization. The instructor began in production agronomy, specialized in plant breeding, worked with small farmers in the developing world and finally focused on sustainable agriculture and agroecology. The stories were so diverse and compelling that we summarized them in a manuscript, “Discovering the whole: multiple paths to systems learning”, that was accepted and published in a teaching journal (Schneider et al., 2005b).

The results of the survey of students, advisors, and employers revealed a wide range of opinions among those surveyed, with students more enamored with the idea of a broad, interdisciplinary course of study than many of their advisors. The latter expressed interest in interdisciplinary perspectives, and were concerned that the opportunity cost of taking too many courses outside the major field would not help their advisees and eventual graduates to be competitive in a job market that they perceived as seeking mostly specialists in soils, plant protection, plant breeding, or other narrow field. The employers surveyed were highly receptive to the idea of interdisciplinary education for undergraduates. They embraced the concept that graduates needed a broad education and appreciation of the complexity of the real world they would face. One employer stated, “You should provide the education, and we will provide the training for the specific tasks people are expected to accomplish.” Thus there appeared to be a disconnect between student interests and faculty advising, and a closer correspondence of what students were seeking and the criteria used by employers in their choice of new recruits. In reflection about the process, we surmised that the survey itself was a potential educational tool with all three groups who may now develop more insight about the importance of interdisciplinary study (Schneider et al., 2005a).

In summary, we explored the motivations, process, and outcomes of interdisciplinary team projects in a course in Agroecology. Accepting that a broad perspective on issues and challenges in the farming and food system would only become more complex and difficult in the future, we were convinced that a systems perspective that embraced multiple disciplines was essential to tackle the uncertainty of sustainable food production with climate change, scarce production resources, changing diets and competition for food, and current inequities of the distribution of costs and benefits within the present system. It was clear that each of us had taken a different route to the appreciation of a systems approach that required tools and perspectives from multiple disciplines. From the survey results we found that students, advisors, and employers were in some agreement about the value of interdisciplinary studies for undergraduates, but there was concern especially among advisors that the demand was still for specialists in unique aspects of agriculture.

In general, the information we discovered has been useful in providing motivation to students in subsequent agroecology courses about the value of team projects in class, and more broadly the importance of building capacities for team work that will be useful in future job settings. Everyone on our small “super team” decided that this was a valuable personal and professional experience, and that similar opportunities should be afforded to students in the future. We have yet to find viable ways to

extend this type of intensive experience in team building and group research to the entire class, in part due to the limited time and energy of instructors. Intrinsic motivation of students continues to be a limitation, and just providing an example of the model along with examples of successful outcomes appear to be inadequate to entice most students to pursue this intensive activity.

References

Patterson, M., A. Carron, and T. Loughead, 2005. The influence of team norms on the cohesion-selfreported performance relationship: A multi-level analysis. Psychology of Sport and Exercise 6:479-493.

Pimentel, D., G. Rodrigues, T. Wang, R. Abrams, K. Goldberg, H. Staecker, E. Ma, L. Brueckner, L. Trovato, C. Chow, U. Govindarajulu and S. Boerke. 1994. Renewable energy: economic and environmental issues. BioScience 44(8):536-547.

Schneider, M., A. Colglazier, R. Beutler, C. Pollard, and C. Francis. 2005a. Student, advisor, and employer opinions on interdisciplinary education in agriculture. J. Natural Resource & Life Science Education. 34:101-106.

Schneider, M., A. Colglazier, C. Pollard, R. Beutler, and C. Francis. 2005b. Discovering the whole: multiple paths to systems learning. NACTA J. 49(2):15-22.

Whatley, J. 2009. Ground Rules in Team Projects: Findings from a Prototype System to Support Students. J. Information Technol. Educ. 8:161-176.

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