Teaching Field Ecology in Central Europe

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Abstract: In general, colleges and universities recognize the value of offering international experiences for students. Relatively few post-secondary institutions, however, offer overseas courses within Biology departments that are taught by regular faculty and available as a course for major credit. Most overseas opportunities for students in Biology involve individual students joining a group arranged by another college/university or a travel company, or consist of an off-campus volunteer or foreign internship program. We were interested in implementing a high-quality, overseas Biology program which was affordable for our students and in which we had direct involvement and control. This paper will describe how our international program developed over a period of years, including specifically how we organized and conducted a 1998 Field Ecology course in Central Europe. A summary of our assessment of the program and planned changes in the program will also be shared.

Keywords: ecology, environmental biology, field biology, international education, program development, Europe

Introduction
One of the most powerful credentials that a student can have on their résumé, whether applying for a job or graduate school, is an international experience (Talbott, 1996). The intercultural and scientific values of having studied or worked overseas are well known and science students are increasingly encouraged to participate in international learning opportunities (Brennan, 1996) and to build a science career by crossing national borders (Ruediger, 1997). In addition, more individuals who are considered as cultural minorities in the United States are studying abroad (Anderson, 1996; Craig, 1998). A number of public and private institutions offer international study experiences within a variety of disciplines and lasting for varying lengths of time. While a number of students from Elmhurst College have participated in these types of courses, a number of factors deter many students in other colleges and universities from participating in these educational and cross-cultural experiences. One deterrent is the financial burden of international travel and another significant factor is that many students lack the experience and confidence of travelling without their immediate family. In response to these, the Department of Biology at Elmhurst College explored the possibility of developing an international program in which our majors could travel overseas, accompanied by faculty they know, and at a reasonable price, so that the opportunity would be open to as many of our day and evening majors as possible.

The Stimulus for an International Biology Program
The decision to make a commitment to some type of international program was influenced by the fact that most members of the department had previously traveled internationally and several had taught, studied or completed research in foreign countries. Thus we had a core of biologists with an international interest, although some degree of faculty development was and remains an important component in our efforts. Over the past twenty years, departmental faculty have periodically offered January term courses in Mexico, the Galapagos Islands, Peru, the Florida Keys, and Hawaii on topics ranging from herpetology to tropical ecology. In addition, a few of our majors have spent a semester in a foreign country, such as Costa Rica, studying biology.

To develop a more substantial “International Biology Program”, we decided to build on our strengths and previous experiences and begin by offering courses aimed at learning Biology in two
widely divergent foreign regions, namely central Europe and tropical America. Not only are these regions different ecologically, but they offer exposure to different cultures and different scientific establishments as well. We have discovered that one of the interesting and instructive aspects of an international biology course for students is for them to see who is practicing biology in a given country or area, what is their background, how are they going about the practice of their science and how is that similar or different from what we see in the United States.

Beginning in 1992, the Biology Department and the Department of Foreign Languages, cooperated to offer a graduate level summer course in which pre-college teachers from the Midwest spent three weeks in Germany. The program grew out of a desire to improve pre-college science teaching in classrooms in the United States. Germany was chosen since it is a highly industrialized country that has been successful in producing excellent scientists and a well-educated citizenry. Participants in the program visited selected schools and class sessions as well as spending adequate time exchanging ideas and methods with their German counterparts. The program resulted in our making many contacts in the German educational system at many levels, and with biologists and other people in national parks and nature preserves. Developing that program and offering it more than once has provided some invaluable experience in setting up international study experiences.

Our previous experience with Mexico and Costa Rica coupled with the hiring of a faculty member of Hispanic heritage who has contacts in Mexico, will be useful in preparing a sound tropical biology program over the next few years. Ultimately, we may alternate our foreign destination from one year to the next if the program continues to progress and courses focused on different regions are developed.

Developing The European Program
After learning of the basic design of our planned program, it was with great enthusiasm and cooperation that our German colleagues became part of the planning, coordinating, and implementing team. We proposed to enroll a group of 24 college/university-level Biology students who had participated in a rather extensive pre-travel preparatory program, including the design of ecology projects which could be completed on-site in Europe. As a part of their preparation students would utilize library resources, the Internet and e-mail communication between the U.S. and Germany.

The details of the itinerary in Europe and specific class activities were worked out by communicating (mail, e-mail, fax, and phone) with European biologists, other scientists, officials and those who were to provide accommodations and land transportation. The instructors visited the University of Munich and various study sites under consideration one year before the intended travel phase. This opportunity was supported by financial assistance from the Elmhurst College International Education Program within the College’s Center for Professional Excellence, by the Faculty Development Committee, and the Office of Continuing Education. Most of the European biologists, other scientists and professors who were to be part of our program were visited personally to work out the finer details of our goals and activities. This visit also allowed us to evaluate those places where our students would be housed to ensure that they would be appropriate for our group.

An association with the University of Munich allowed us access to laboratories and special field sites of interest for environmental studies. In addition, the biologists at the University were experts who provided invaluable information and insight into ecological matters in Central Europe.

The European Nature Preserve site was selected because it is a wetland area on a major bird flyway between northern Europe and Africa and a key place for observing both common and rare European bird species. A laboratory was available to us at their Environmental Station, and this preserve is close to other sites (such as the Bavarian National Forest and moraines near Salzburg) of interest to us. The Alps offered ecosystems for altitudinal vegetation zone studies and the opportunity to learn about alpine nature preserves in Berchtesgaden National Park.

Program Goals

**Course goals included:** to study managed ecosystems (forest, stream, wetlands and alpine areas in national forests, national parks and the European Nature Preserve); to learn about environmental research and ecological issues of interest to Germans; to conduct field research projects on biodiversity, vegetation zones in the Alps, and human influence on ecosystems; to observe German and Czech ecosystem management strategies; and to study the geography, history, art, and cultural diversity in Bavaria, northern Austria, and the Bohemian National Forest section of the Czech Republic.

The Europeans have more commonly seen American students from other disciplines (e.g. Art, History, Language, Politics, etc.) coming to study in Europe. Thus, the prospect of working with a group of American Biology students appealed to European scientists and other officials. Our goals for the 1998 program included both biological and cultural objectives.
International educational experiences allow for personal growth and development resulting in increased confidence and self-reliance. As importantly, first-hand knowledge of and interactions with the people of a particular area often breaks stereotypes. This is important not only for the students' perception of a particular group of people and their culture but also for the people in the host country and their perception of Americans. Our perceptions of other cultures and the state of the environment often comes from the reporting of news stories or television programs. This may not be a correct and balanced reflection of reality. One goal of this course has been to give students a truly global and realistic view of society in central Europe. To this end, activities were included such as lodging with local families in some of the areas visited and extensive informal contact with German biologists and others.

The Nature of the Course and Its Participants

Prerequisites: Since we wanted the course to be taught and learned at the level and in a manner appropriate for biology majors and minors, enrollment was restricted to either biology or environmental management majors who were in good standing at the College and who had completed at least one full year of biology classes.

The Students: Class size limit was set at 24 and the class was fully enrolled. Due to the late withdrawal of one student, the 1998 travel group included 23 students (19 women, 4 men). Five of the students were graduating seniors.

The Faculty: In order to appropriately manage student projects and field work in Europe and to ensure the quality of the overall experience for students, three faculty members (2 male, 1 female) led the program. Dr. Beth Vlad has expertise in Plant Taxonomy, Field Botany and Environmental Biology and, having lived in Germany as a child, is familiar with various aspects of German culture. Dr. Kent Kerby’s primary expertise is in Botany, Genetics and Molecular Biology, and Environmental Biology. He has done scientific research in Denmark and is familiar with Central Europe. Dr. Frank Mittermeyer is a microbiologist who has extensive study and practical experience with the ecology of Central Europe and is fluent in German. This course was counted as one course for each faculty member in determining workload and compensation for the year.

Pre-travel Phase of the Course: Beginning in September, 1997 our overall plan for the pre-travel portion of the course was to help students prepare both mentally and physically for a successful and enjoyable educational experience in Europe. Students were given reading assignments and seminar style meetings were scheduled biweekly during Fall, 1997 and then nearly every week during the Spring, 1998 semester. Information was presented to the students by several invited guest speakers from various departments on campus on the historical, cultural, geological, and ecological background of the areas we would be studying. This was also the time for student teams to select, investigate and then make an oral presentation on the project topics they were preparing to complete in Europe. It quickly became clear to students that we would be doing serious biology work in the course and not simply going on vacation to Europe. One of the benefits of having the pre-travel work in the course and not simply going on vacation to Europe. One of the benefits of having the pre-travel meetings was that it gave the students and instructors many opportunities to interact, which allowed the instructors to observe any potential personality conflicts within the group. The students benefited from the interaction by being able to learn from each other and to make better roommate choices before the travel phase.

The variety of topics that were covered by guest speakers gave the students a more nearly holistic view of the interconnectedness of our global society, as well as the ability to compare and contrast American ideologies and stereotypes with those of the European and German cultures. Some of the topics included were: Ecology of Central Europe, Environmental Ethics, Urbanization in Central Europe, History of Southern Germany and surrounding area, Art and Architecture, Physical Geography of Southern Germany and the Alps, National Parks Management in the U.S. and Germany, German and U.S. Environmental Attitudes, Policies and Politics, Everyday Life in Germany, The German Language (practical phrases, some biology terminology), and Intercultural Awareness. Students were given information about the day-to-day itinerary, the cities and natural areas they would encounter, the type of field work they would experience, the European scientists they would meet, the monetary systems in the three countries they would visit, practical tips for what to take overseas, how and when to apply for a passport and the International Student Identity Card, and how to conduct themselves while travelling.

Students kept notebooks during these meetings in order to have written records of the information and also kept a record of their background research pertaining to their projects. Expectations that they had for the course, as well as what they expected to learn about their projects while in Europe were also noted. They also presented questions pertaining to their project topics for other students to consider and answer during the course. Questions to be addressed to the German experts and scientists, who were to be involved as part of the course overseas, were also included in this notebook.

The presentations given by the students during these meetings were an opportunity for the rest of the class to see what types of investigations were going to be carried out by their peers. It was an excellent way to focus the students on their projects, have them begin planning their research methods and locations, and
gather background research and supporting documents far in advance of the actual completing of their projects and final papers.

All of the professors, students, biologists and others who were part of our program in Europe, were fluent in English. One difficulty in implementing a rigorous language requirement in this course was that most of the student participants were of junior or senior standing. As such, their class schedule was fixed. However, all had previously studied a foreign language and some were fluent in a second language spoken at home. Early in the academic year, one of our German professors introduced the language, and phrases were added through the seminar series. Each student received a German language self-study tape and book which were provided at no cost by Inter Nationes e.V., Audivisuelle Medien of Bonn, Germany.

Two other pre-travel activities were a special informational meeting on campus in which the group gathered together with parents, spouses and friends, and a dinner together at a German restaurant near the campus. In addition, students engaged in some fieldwork in and around our local area as a way to prepare for work in Europe.

This somewhat ambitious program of pre-travel preparations was considered essential in helping to prepare the students for their travel, research, and interpersonal interactions while in a foreign country. Since the travel portion of the course was to be more than 3 weeks long, it was felt that it was vital that the students have a thorough understanding of many of the differences that would be encountered by them in the various aspects of life. The instructors wanted prepared, high quality student participants, who would be good ambassadors for the United States. A consequence of the pre-travel work was the development of a sense of cohesion and camaraderie within the group.

The following are examples of student field project work: identification and comparison of plant species at different elevations, the use of lichen species to predict air quality in various locations, studying evidence and impacts of acid-rain injury to ecosystems, comparison of bird species seen in Europe with those of the U.S.

The European Phase of the Course

Our itinerary in Europe began with a week of field and laboratory work in cooperation with biologists at the University of Munich, Freising campus. The second week focused on study in and near the European Nature Preserve on the Inn River north of Salzburg, Austria. The final week emphasized ecology of alpine habitats in the German and Austrian Alps. Throughout our stay in Europe, a motorcoach was available to take us where and whenever we wanted to go.

To supplement independent team field studies by students, special presentations were made by German professors and biologists engaged in study or research on topics including forest genetics, to biodiversity, nutrient fluxes in ecosystems, the impact of acid-rain, ecosystem management strategies, and current environmental problems in Germany.

In addition to special birding opportunities at the European Nature Preserve, students collected and identified insects, made determinations of water quality as based on German standards, and learned of techniques being applied to maintain biodiversity and to reintroduce species.

Students were expected to keep track of their daily experiences in Europe and reflect on the differences and similarities between the United States and central Europe. Students kept a daily journal and a separate field notebook for data from the different ecosystems encountered. On the last day in Germany, each student team gave a presentation summarizing the findings of their fieldwork. Upon return to the U.S., students had one week to complete a paper on their field project work in Europe and hand in the paper, their field notebook and daily journal. All of these were reviewed as a part of the student's evaluation. In addition, all students were evaluated on their conduct during the course, including their attendance and participation in all course activities and their personal behavior while in Europe.

Keeping the Cost Affordable for Students

In our 4-1-4 academic year, tuition for full-time students allows them to enroll in Fall, January Term and Spring Semester courses without paying additional tuition. Students taking Summer Session courses, however, must pay additional tuition on a per course basis. Since our program included seminars, meetings and other group activities that began in September, 1997 and ran through June, 1998, we were granted permission to list the course as a Second Semester course. This made it possible for students to have course tuition included in regular fees and made it possible for students to apply some financial aid toward course expenses.

Since the amount of time involved in our program was extensive, we were encouraged to consider awarding students 1.5 or 2.0 course credits, however we offered the course at 1.0 course credit.

Without utilizing a travel agency, we made arrangements for accommodations, land travel and all educational and field experiences in Europe (including the rental of laboratory space, equipment and the use of chemicals at the Environmental Laboratory of the European Nature Preserve).
Modest honoraria were paid to select experts who worked with our group. For example, one evening was spent with an expert on bat biology. Air transportation was purchased through an agency. We solicited bids via FAX and e-mail for all expense items in our budget and this resulted in significant savings. All of this, plus the aid of contacts (biologists) in Europe who were very willing to help us make arrangements, reservations and bookings kept student costs down. Our contacts also made it possible for us to have students stay in family homes for at least part of our time in Europe. We did rent these rooms but at a very minimal cost. Since membership in the class was established early, we were able to make bookings well in advance of the trip and typically, at a lower cost than if they had been made later.

Students raised some funds to support the group and Biology alumni were contacted by letter and asked if they would be interested in supporting this international opportunity for our students. The result of these various activities was that the actual cost to each student, before receiving financial aid, was about $2000.

Student Evaluation of the Program

A student survey was distributed at the beginning of the course. Students were surveyed about previous travel, ownership of a passport, reasons for interest in the course, languages studied, willingness to fundraise, and reasons for interest in travel to Central Europe. The purpose of this form was to ascertain the level of interest present in the student population for the program, and to formulate a course structure that would enable the instructors to best prepare the pilot group for the program.

A post-travel questionnaire was designed to gather assessment responses to the course plan and structure. Some questions pertaining to changes in student perceptions about themselves and other countries as a result of this experience were also included on the form.

The overall student response to pre-travel preparation was that it should involve a more concentrated amount of information given in a shorter period of time. Most students responded that a short, practical course in German would be beneficial. The students all felt that it was a worthwhile experience for them both scientifically and culturally, and that their preconceived notions had, in many cases, been turned upside down.

All students felt that their level of cultural understanding had been expanded, and that they had gained more confidence in themselves as travelers and as biologists. They felt that they had gained a more meaningful picture of what it means to have a global view of environmental issues. The students felt that this definitely was a worthwhile course and experience and they recommended repeating it. Other suggestions for change included: a smaller class size, more clearly defined rules during free time, changing the number of overnight stays in certain study sites, and perhaps focusing studies in fewer areas. These ideas have already had an impact on the planning for the next offering of this program in 1999.

Conclusion

This Biology program was considered to have been a successful learning experience by all who participated in it, including both Elmhurst students and professors, as well as European contributors.

A very positive impression was left behind in Europe and we have been invited back to the University of Munich and other sites in which studies occurred. A special invitation has been received for our next group to participate in forest ecology research going on in Bavaria and the Alps.

International study courses, regardless of the subject, are multidisciplinary in nature. The seminar series allowed professors from different departments at Elmhurst College to contribute to the success of this course. Not only did the students benefit from the expertise offered by these instructors, but these guest lecturers were provided with a course model that can be applied to any discipline.

Following the assessment process and some rethinking of our course design, we have organized a class that begins in January 1999 and ends with travel and study in Europe during June 1999. We will be revisiting some places that were part of the 1998 program and the main emphasis will be on studying variations in ecosystems seen at different elevations from the alpine foothills to the highest Alps. Though a very brief exposure to German words and phrases was included last time, we are working to organize a more effective exposure to practical language skills for travelers. Opportunities that will allow interested students to complete extended study and/or internships in Europe as a follow-up to our program are also being investigated.
While one goal of this course is to offer international study experiences to as many students as possible, we believe that a class size of 15-18 students would allow us to more effectively accomplish our goals. In addition, while fundraising did contribute to a small reduction in the overall costs to the student, a great deal of time is associated with these activities. This factor must be weighed when considering the benefits of fundraising. We are however, investigating corporate and grant funding support for our students.

Acknowledgement

We are extremely grateful for the efforts of our German colleagues and biologists and particularly Wolfgang and Eleonore Spierling who were and remain a major force in helping to coordinate and implement our course activities. Dr. Karl-Eugen Rehfues of the University of Munich deserves special recognition for his coordination of field and laboratory experiences. We also wish to acknowledge the input given by Dr. Wally Lagerwey, Chair of the Department of Foreign Languages and Literature, and Director of International Education at Elmhurst College. In addition, we want to thank all those who supported the development of this program, and most particularly Dr. Michael Bell, Dean and Vice President for Academic Affairs, Dr. Larry Carroll, Director of the Center for Professional Excellence, and Dr. Richard Roughton, Dean of Continuing Education.

Literature Cited


Call for Applications

John Carlock Award

This Award was established to encourage biologists in the early stages of their professional careers to become involved with and excited by the profession of biology teaching. To this end, the Award provides partial support for graduate students in the field of Biology to attend the Fall Meeting of ACUBE.

Guidelines:

The applicant must be actively pursuing graduate work in Biology. He/she must have the support of an active member of ACUBE. The Award will help defray the cost of attending the Fall meeting of ACUBE. The recipient of the Award will receive a certificate or plaque that will be presented at the annual banquet; and the Executive Secretary will provide the recipient with letters that might be useful in furthering her/his career in teaching.

Application:

Applications, in the form of a letter, can be submitted anytime during the year, but must be received a minimum of two months prior to the Fall meeting. The application letter should include a statement indicating how attendance at the ACUBE meeting will further her/his professional growth and be accompanied by a letter of recommendation from a member of ACUBE. Send application information to: Dr. William J. Brett, Department of Life Sciences, Indiana State University, Terre Haute, IN 47809; Voice -- (812)237-2392 FAX (812)237-4480; E-mail -- lsbrett@scifac.indstate.edu

If you wish to contribute to the John Carlock Award fund, please send check to: Dr. Marc Roy, Executive Secretary, ACUBE, Department of Biology, Beloit College, 700 College St. Beloit, WI 53511.