

## **The Benefits of Active Learning: An International Case Study from a Student's Point of View**

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### **Abstract**

This paper describes a unique international, cross cultural, multidisciplinary, experiential course taught at Indiana University-Purdue University Indianapolis (IUPUI), a large, urban university in the United States. The course was developed out of a partnership with the Berufsakademie Mannheim (BA-M), a cooperative education university located in Mannheim, Germany; and in cooperation with several corporations located in and around Mannheim, Germany (ABB, BASF, MVV Energie, and DaimlerChrysler) as well as a small community partner, the town of Ladenburg, Germany. The course GO GREEN, stands for Green Organizations: Global Responsibility for Economic and Environmental Necessity. This paper focuses on the benefits of the active learning methods used in the course and the benefits of the course through the eyes of the students who took the course during the summer of 2003. The challenges and opportunities in continuing to offer the course will also be discussed.

### **The GO GREEN Course**

The GO GREEN course was originally developed to teach engineering and technology students about sustainable developments and methods using best practices in industry as real life examples. However, after the course was initially designed and conceived it was decided that students from all areas of study could benefit from the topic and it was opened to all Indiana University- Purdue University Indianapolis (IUPUI) students. Universally “sustainable development” represents development that meets that needs of the present without compromising the ability of future generations to meet their own needs. Germany’s industries were targeted because of their known sustainable practices as well as an opportunity to give students a global business perspective. A prerequisite of a one to three credit hour course in “sustainability” was required along with a junior standing.

Objectives of the GO GREEN course are:

- To acquire a base knowledge of issues in sustainability as they relate to businesses and industries internationally and nationally
- To examine and evaluate case studies of sustainable practices in business and industry
- To visit international industries and organizations that practice sustainability to gain first hand knowledge of operations
- To identify trends and business practices in various sustainable organizations
- To utilize information from the course to apply sustainable knowledge and methods in the workplace upon return
- To acquire knowledge of the German culture and some basic language skills (enough to be polite)

The GO GREEN course involved presentations, short lectures, industry tours, site visits and discussions with sustainable leaders in BASF, ABB, DaimlerChrysler, MVV Energie, and the town of Ladenburg, Germany. The German entities were then compared to similar entities in the United States in a ten page paper that was due approximately one month after the visit to Germany. Course readings included models and case studies of sustainable organizations such as Interface, Nike, Coca-Cola, Apple, Shell, and Coors. Additionally, students kept a journal while they were in Germany to record their daily experiences of their industrial visits and their cultural interactions and experiences.

The GO GREEN course was offered for the first time during the summer of 2003 with seven students enrolling in the course. Five instructors, each from different disciplines, were involved in the course (Interior Design, Organizational Leadership and Supervision, Mechanical Engineering, German Language, and Executive Administration).

The seven students enrolled in the course were diverse by major: a German language major, an Informatics major, two Construction Technology majors, two Organizational Leadership and Supervision majors, as well as an Interior Design major.

### **Learning 101 --A Student Perspective**

George Bernard Shaw once said, “What we call education and culture is for the most part nothing but the substitution of reading for experience, of literature for life, of the obsolete fictitious for the contemporary real.” The traditional teaching methods of most colleges could largely be described as George Bernard Shaw perceived generations ago, hollow representations presented as a replacement for experience. The attempt to create good employees from college students is a battle typically fought with book and ballpoint in hand. Any kind of training in real-world experiences is scarce in academia. The daily challenges of today’s workers are often foregone in higher learning institutions for theoretical instruction, leaving students unprepared for their career despite the thousands of dollars spent and time invested in their education. In fact, for many, their first training starts on the first day of work after graduation. This creates a

gap between what industry needs and the product that actually comes out of the university—the graduate.

One solution to the dilemma of having more qualified graduates ready for industry is incorporating active learning in the curriculum: learning through listening, observation, interaction, and activity. Today, engaging students in a world filled with information and distractions, we need to create learning environments for students that promote a multidimensional approach <sup>1</sup>. The GO GREEN course at IUPUI is an excellent example of overcoming the problem emphasized by George Bernard Shaw. The course instructors for GO GREEN used a series of intensified sessions which included short lectures, cultural interactions, international industrial site visits, case studies, readings, class discussions, and independent student work. The combination of all these experiences enabled the students to learn from seeing first hand examples of sustainable practices in industry that included real-world challenges. In addition, the course inspired student creativity by providing a catalyst for new ideas while awakening an awareness and appreciation for cultural differences.

GO GREEN is a course designed for students from various disciplines that instructs students in global awareness and responsibility for economic and environmental applications in various industries and services. During the GO GREEN course, German companies leading their markets toward utilization of environmentally friendly methods are studied and visited. The following paragraphs illustrate how the teaching methodology (active learning), as applied to this course, follows a student through an awareness process that led to knowledge then applying the knowledge to a particular career or chosen field to be both environmentally and socially responsible.

Initially, preparation for the overseas portion of the trip of the GO GREEN course began with independent student research into each German company to be visited. Presented as case studies, the study of the German companies allowed the student to develop a general understanding of the given industry. The process involved a student inventory of the industry's products, services, environmental practices, policies, and practices. The case study method of teaching encouraged critical thinking, problem solving skills, and creativity by demonstrating varied complex solutions to environmental and financial challenges. Students developed an understanding of the cycle of demand and the consequences of the methods used to provide a supply.

An integral component of the course was learning from multiple sources and in diverse ways of approaching and solving problems. The format of the course supported this objective two ways: maintaining a small class size and utilizing case studies that could be analyzed by many different disciplines. The small class size enabled the students to develop positive functional relationships with one another and the instructors. Similar to work groups utilized by many companies to address international issues, the work groups were composed of students from a variety of backgrounds, ages, and chosen career paths. Both the format of the course and the curriculum encouraged flexibility and teamwork.

The most challenging and exciting segment of the course was the international travel to Mannheim, Germany. Unable to speak German and unfamiliar with transportation methods, students were forced to independently and jointly adapt to the new surroundings. Learning to use the train and bus system was challenging, however, achievable if you were to explore your surroundings and experience the city and German culture. Although somewhat limited, there was plenty of time to see and live German daily life, visit museums, and talk to the German people. As part of the course activities, site visits were scheduled with several companies and with the Berufsakademie, Mannheim. Each company provided in-depth information about their company history, products, sustainable methods, and equipment designed to conserve Germany's limited natural resources. Company tours enabled students to see and analyze, up close, how complex technical systems functioned and how they were developed to enhance resource utilization. The industries visited included a local utility company, automobile company, waste treatment facility and a local community known for sustainability and resources conservation. Industry representatives answered questions regarding technical functions, efficiencies, productivity, and social interests in an open manner. Thus, students were able to witness the benefits and consequences of various environmental practices, to possibly be applied, later, within the student's chosen career field. In order to remember their experiences, students kept a daily journal, writing about their daily experiences at the industry visits and their daily encounters and cultural experiences while in Germany. Journal writing is an informal reflective type of writing that is considered a student-centered learning activity<sup>2</sup>.

In addition to the academic benefits of the course, a better understanding of the differences between cultures encouraged personal growth. Although the time in Germany was limited, there was enough time to provide some insight into the priorities, interest, and customs of the German people. The Germans interacted with displayed kindness, willingness to accommodate, eagerness to share and learn, and patience. The one cultural difference that stood out was their balanced lifestyle. Despite the industrial atmosphere of the town of Mannheim, and the aggressive pace of business, shops and stores closed early in the evening and on Sunday to enable people to prioritize family life or simply encourage a more balance lifestyle. As Americans, our attempts to meet everyone's needs at any given time has resulted in many individuals being forced to work hours that take them away from valuable time with family and friends. Although suitable to the complicated lifestyle of a student working through college, there are important aspects to living a fulfilling balanced lifestyle.

Germany, a country roughly the size of Illinois and limited in space, has encouraged international trade and necessitates positive relations with its geographic neighbors. Interaction with various peoples and customs appears to have created a greater tolerance among the German people for different customs than is customary to the average American. For the student able to participate in this course experience, knowledge of the culture and social structure within Germany, as a political and technological bedfellow of the United States, will provide a competitive edge upon entering into their chosen field.

Within the civil engineering and construction technology professions, the Germans are able to sustain resources by reusing most materials, typically disposed of upon demolition in the U.S., either directly or through recycling processes. Instead of destroying existing structures,

unique rehabilitation methods were used to improve utility. In addition, technology for draining systems, plumbing facilities, and gray water re-usage reflect the high value placed on clean water. This also was apparent in the agricultural practices seen among crop fields. The erosion control and water quality practices were much more common and lush than seen in the United States. Having seen good conservation practices successfully applied, enables students to apply this knowledge to their professions in the future.

Overall, the GO GREEN course assisted in preparing students to deal with real technology, real-life challenges, cultural differences and global issues. It inspired creativity by providing a catalyst of new ideas. The format of the class and the active learning/teaching methods used achieved this goal and enabled the students to both personally and professionally grow. Experiences in active learning are personally rewarding and self-perpetuating<sup>3</sup>. Upon later reflection, I was struck by an expanded and renewed understanding of a principal I thought I already recognized. As Dr. Jeffery Borenstein said, “Just when you think that a person is just a back drop for the rest of the universe, watch them and see that they laugh, they cry, they tell jokes ... they’re just friends waiting to be made.” Regardless of cultural differences, the same basic needs drive humanity as a whole and individually; how we perceive the world often comes down to how we deal with one another. Although, I realized this concept as it fit into my world, my interactions with the German community provided me with a more complete understanding of the way humans seek to interact with one another. I have felt inspired to close the gap between Americans and our European neighbors and to accommodate the technological and social interest of my country, and theirs, as I develop my own career. The world seems a little smaller today.

### **Other Student Comments**

The very best part of this class from the instructors’ point of view was the satisfaction knowing that the students truly learned from and enjoyed their experiences while taking this course. This course was design specifically so that students would learn about and experience German culture in addition to learning about sustainable practices in an international setting. Learning about cultural differences was as important as understanding sustainable development and why Germany and the European Union (EU) are more advanced than the United States. Below are some quotes from the student papers that show their satisfaction and some evidence of learning in the course:

*“When I first was introduced to sustainability, I thought that meant recycling and planting trees. Through this class I realized it is that and much more. By being interdisciplinary, this course allowed students from all backgrounds to learn the importance of sustainability. Everyone was able to take something different away from this class. By restricting this class to students in one department, it would inhibit students from applying sustainability to all aspects of their career.*

*From this trip to Germany, I was personally able to gain a better knowledge of German culture. From learning about their sustainable practices, I was able to understand many of their other cultural differences. Also, in any career that I may use my knowledge of German in, I will also be able to use my knowledge of*

*sustainability, and who know what that might involve.” Alison Land – German Major Student – GO GREEN Summer 2003.*

*“The learning and usefulness from this interdisciplinary study can be measured in a number of ways. First, did I learn anything? Absolutely. This experience was not only in a topic of study I already had some interest in but it gave me the opportunity to round out the remainder of my undergraduate education in a study abroad experience through a different department. Second, did I have fun? Some people might think that fun isn’t a pre-requisite for learning. But think of how much more this topic has been ingrained into my memory and knowledge base because I enjoyed the experience. Third, I was able to meet new people and network in different fields of study and interest.*

*The readings were successful in adding perspective to the subject. I feel they increased the understanding level of why the things we were learning were important. Without some of the required readings there would not have been the same perspective or experience in the field.*

*The visits to the sites in Germany were critical to making the whole experience an applicable and memorable one. I am much more of a hands-on person and being able to see what these companies are doing in green design and sustainability allowed me to better understand the topic.*

*The US-German comparisons also helped broaden my general knowledge base about sustainability. It added perspective on what companies are doing here.*

.....

*My role as a customer, citizen, manager or decision maker will be different in light of this new awareness. I hope to retain this spirit of importance and need for change as I make decisions and choose products.” M. Craig Bowen - Multi-Media Student - GO GREEN Summer 2003.*

*“Obviously we toured and learned how some pretty major companies operate and apply sustainable practices to their operations. These companies have placed a value on sustainability that could be qualified in dollars. This sends a message that is hopefully echoed around the world that sustainability is important. Its importance on an industrial level is huge because industry has a higher impact on the earth and all of us. However, this experience has also shown there is a need on an individual level to apply the same basic sustainability principles of reducing, reusing, and recycling to our everyday life. The every-person culture of recycling in Germany needs to be ingrained into American culture. I have seen on this trip that Germany leads the U.S. in the adoption of sustainable practices. I now also see the need for us to step up and be responsible for ourselves and our impact on those around us.” M. Craig Bowen - Multi-Media Student - GO GREEN Summer 2003.*

*“The language difference originally was concerning, but after arriving I found that most people could speak English without much difficulty making it easy to communicate. Another pleasant surprise was the friendliness of the German people, who on more than one occasion, went beyond the norm to be helpful and*

*accommodating.....Just as things became more familiar and similar they also remained different, adding to the enjoyment of the trip. The lessons learned in Germany went beyond the expected.” Christina Osborn – Interior Design - GO GREEN Summer 2003.*

*“.....The experience of visiting another country with nearly all the same attributes and fewer resources to work with makes me appreciate the fact that I am an American. It also reconfirms to me how important it is to be tolerant, understanding, and open-minded to the ideas of others.....” James Young – Construction Technology Student – GO GREEN Summer 2003.*

These quotes summarize just some of the remarkable learning experiences that the students achieved in this interdisciplinary course during the summer of 2003. This course was a learning experience for everyone involved, including the instructors. While the professors presumably know more about their subject matter than do their students, learning doesn't just occur on the student side<sup>4</sup>. In this multidisciplinary course, everyone involved was in the learning mode. It was a great experience for everyone.

### **Challenges and Opportunities**

The cost of the program is the biggest dilemma for our students. While the costs are not outrageous, working students are always poor and looking for ways to fund the travel expenses of the trip and the course. At the high end, the trip may cost up to \$2,500 (in addition to the cost of the course), however, there are ways that expenses can be trimmed. Some students last year spent as little as \$1,500 for their trip. The faculty are working on ways to find scholarships and grants to help support the overseas course.

In addition to taking the course, two of the undergraduate students did research projects while they were in Germany. One student researched green roofs and another student researched building materials. They both received small grants from the campus to accomplish their research. The funds assisted in additional stays and travel while they were abroad. More student and faculty research opportunities will be pursued with industries and our academic partner, the Berufsakademie, Mannheim in the future.

This was the first study abroad course for the IUPUI School of Engineering and Technology. The school is very grateful to the German industry sponsors who welcomed our students and faculty and provided all of them with a unique opportunity to look at their sustainable practices and developments. The course instructors are looking forward to adding new industries to the course in the future. Currently, plans are underway for subsequent yearly offerings of the course.

## References

1. Goff, R.M., The Art of Creating an Active Learning Environment, in the 2002 proceedings of the American Society for Engineering Education Conference and Exposition, Montréal, Quebec Canada, June 16-19, 2002.
2. Zimmerman, A., Lima, M., and Christy A.D., Student-centered learning activities, Resource: Engineering and Technology for Sustainable World. August 2003 v10 i8 p9(1).
3. Grasha, A.F., Introduction: encounters with active learning in four disciplines, College Teaching, Summer 2002, v50. i3. p82 (1).
4. Raney, D., Whose Authority? Learning and Active Resistance, College Teaching., Summer 2002 v51 i3 p86(6).

## Biographical Information

### PAULA BATY

Paula is a senior standing student in the Department of Construction Technology. Paula will graduate in May 2003 with a Bachelor of Science. Paula is a member of the Construction Specifications Institute (CSI), the Society of Student Constructors (SSC), and the American Society of Agricultural Engineers (ASAE). She is employed part-time and summers as an Engineer Student Trainee with the USDA Natural Resource Conservation Services. Paula received an undergraduate research grant from IUPUI for research work she did in Germany during the summer of 2003 on green vegetated roofs.

### PATRICIA L. FOX

Patricia L. Fox is the Associate Dean for Administration and Finance and Assistant Professor of Organizational Leadership and Supervision in the Purdue School of Engineering and Technology at Indiana University-Purdue University Indianapolis (IUPUI). She is one of the instructors of the GO GREEN course at IUPUI. Pat currently is the Chair Elect of the Engineering Technology Council. She received her MBA from Butler University.