

2006-69: CREATING CULTURAL UNDERSTANDING IN ENGINEERING TECHNOLOGY CURRICULA

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Creating Cultural Understanding in Engineering Technology Curricula

Abstract

Global industrial opportunities have expanded exponentially, changing the educational and experiential needs of today's graduates. With more and more opportunities to interact with other cultures through customers, subsidiaries, joint ventures, and organization expansions, engineering and engineering technology graduates need a deeper understanding of the cultural differences that await them.

At the University of Dayton, the Engineering Technology department has taken a two pronged approach to creating cultural awareness and understanding in the curricula. Students interested in expanding their knowledge of other cultures can take IET 415, Management of Technical Organizations, a course specifically designed to discuss cultural management issues in today's global economy. More adventurous students can participate in cultural experiences offered by either the ETHOS or study abroad programs offered at the University of Dayton. The first section of this paper describes the structure of the course, including a look at the pros and cons of offering such a course. The second half of this paper provides insight into a recent study abroad experience in China involving engineering technology students.

IET 415 Management of Technical Organizations

IET 415, Management of Technical Organizations, began as a traditional organization and management course. Over time, based on the input of our industrial advisory committee, the course evolved into a course focusing on four key topics:

- developing a working knowledge of current business management practices
- understanding the effects of globalization on organizational competitiveness
- understanding how cultural diversity, ethical conduct and social responsibility affect decisions in the workplace
- developing a working knowledge of teams, teamwork, negotiation and personnel management in a diverse work force.

In today's environment of global competitiveness, all four of these topics take on a world-wide perspective. Our graduates may work in the U.S. for a multi-national U.S. corporation or work in the U.S. for a multi-national foreign corporation or work with multi-national customers. In many organizations, a stint overseas is often expected, so our graduates may work in another country for a multi-national U.S. corporation or work in another country for a multi-national foreign corporation. An introduction to cultural and business practices throughout the world is important for their success upon graduation.

Based on these four topic areas, the Management of Technical Organizations course (Figure 1) is divided into three sections:

- Management Today
- Globalization and International Management
- Personnel Management

The Management Today section provides the background and underlying foundation for the course. Topics include: traditional and non-traditional organizational structures, current employment environments and current issues being faced by organizations. Much class discussion revolves around topical business articles that provide insight into how existing organizations handle management issues.

The principle focus of Globalization and International Management is cultural differences among countries. Topics include: managing a diverse workforce, international business partnerships, living and working abroad, managing employees in another country, and managing workers from another country in the U.S. Discussions are also held on ethical behavior and societal responsibility and how cultures affect these issues.

Personnel Management focuses on managing a diverse workforce. Employee diversity, teams, and teamwork are emphasized in this segment of the course. Students discuss leadership issues as well as investigate how to keep employees on track and on target toward organizational goals and objectives. Students cover communication issues from a manager's point of view. This is also the section of the course that discusses U.S. labor legislation, employee rights, compensation, wage determination, and negotiation.

Two key student projects form the basis of much class discussion. Each student is expected to research an assigned country in detail. Their detailed presentation to the class is expected to cover business etiquette, cultural orientation and context, business practices, negotiation practices, business travel, business entertaining, protocol, gestures, and customs such as greetings, meal etiquette, and dress. Country presentations are limited to the 25 or so countries where our students might be expected to work. These countries include European countries like Italy, England, France, and Germany; Asian countries like China, Japan, and Korea; India, Brazil, Russia, and Australia. This exercise makes students aware of different cultural practices in business and encourages them to find commonalities between their country and the countries under discussion. Because each presentation follows a standard format, it is also effective at enabling a student to acquire a depth of knowledge in one specific country while learning to compare and contrast information from a number of countries.

The second assignment is designed to give students insight into the complexities of international business. Students are required to find and present a current business article related to a course topic of their choosing. The companies in the articles are followed throughout the term as their business dealings unfold. In class discussion enables students to develop a working knowledge of current business management practices and to understand the effects of globalization on those practices. For example, during one semester, students tracked Rupert Murdoch's attempts to obtain recognition for his TV network activities in China.

Throughout the semester, as the student presentations take place, in-class discussions relate student presentation material with topics covered in the text. Thus students are able to gain an

understanding of how diversity in industrial settings, and cultural contexts and practices will affect personnel management, negotiations, teams, and teamwork. These discussions also build student understanding of how cultural contexts and practices affect an individual's and an organization's social responsibility, ethical conduct, and other business practices.

The structure of the course can be unwieldy at times. Students are encouraged to discuss the current topics and countries following each presentation. Because of active participation on these interesting topics, there are days when the discussion cuts into time to cover material from the text. The instructor has to practice good time management skills in order to cover the necessary material that supports the student presentations.

IET 415 is a required course for students majoring in Industrial Engineering Technology, but not for other majors and is offered only once a year. Non-IET students hear by word of mouth about the structure and content of the course. During any given year, enrollments vary from as few as 12 students to as many as 25 depending on the interest of students. Enhancing enrollment in the course requires knowledge and effort on the part of the faculty advisors too. We make a concerted effort to get the word out about the benefits of taking such a course.

Summer Study Abroad in China

The University of Dayton has had a Study Abroad program for many years. The Interdepartmental Summer Study Abroad Program (ISSAP) has included programs in Morocco, Paris, London, Florence, Dublin, Hawaii, and Costa Rica, and many others. In the summer of 2005, an initial pilot study abroad in China was conducted. The program consisted of five courses; two engineering technology courses, a history, an art and a Chinese culture course. Three faculty participated; one each from engineering technology, history and art. A Chinese assistant accompanied the group on the tour. Twelve students; six engineering technology students and six from arts and sciences took part. The group spent a total of 33 days in China and visited five major cities. The students were exposed to a broad range of Chinese culture, both social and technical. The program included tours of museums and other historical places as well as tours of manufacturing facilities in China.

Courses Taught in China

The two Engineering Technology courses taught in China were IET-308 Production Management Methods and IET-415 Management of Technical Organizations. The Production Management Methods course includes Lean Manufacturing concepts, Just-In-Time, Kaizen, small lot production, setup time reduction, total productive maintenance, pull production, focused factories, standard operations, and defect-free manufacturing. The IET-415 Management of Technical Organizations course was described previously.

Before leaving on the trip, each student was given a subject to research using the Internet, library, magazine/journal articles, etc., and make a presentation on while in China. The presentations compared US versus Chinese ways of managing production and people.

As part of program requirements, all students kept a daily journal to help them remember and reflect upon their experiences in China. Students were encouraged to include sketches, photos, or paste material onto the journal pages that would help them to remember specific details.

The courses included tours of plants in China and students explored differences or similarities in Production Management methods used in the US, such as Lean Manufacturing, Just-in-Time, and Supply Chain Management compared to methods used in the Chinese plants. Students in the Management of Technical Organizations course compared and contrasted differences in management techniques and styles. Students studied diversity in the workplace concepts and experienced it first-hand.

Beijing

Two Chinese students from Beijing University accompanied the group while in Beijing. We experienced our first Chinese meal, served family-style with dishes in the center of the table passed around on a large Lazy Susan for all to share. In Beijing, the group visited the Great Wall, the Temple of Heaven, the Forbidden City and Tiananmen Square.

The first manufacturing plant visited was the NCR plant in Beijing, which manufactures ATMs for the Asian market. The Plant Manager provided a general overview of the NCR facility by about the mission, workforce, facility area, production output, etc. The Manufacturing Manager was from Scotland and the only non-Chinese person in the plant; he discussed their manufacturing practices and policies as well as what it was like to live and work in China. The Human Resources Manager discussed some of the policies and statistics concerning management of the workforce. During the plant tour, each member of our group was escorted by one of the Chinese workers. This was our first experience in trying to communicate with a Chinese person and was very enlightening as most of the workers spoke little or no English.

Nanjing

The group spent about two and one-half weeks at Nanjing University (NJU). We were housed in the Nanjing University Nanyuan Building. Classes were held almost everyday, including holidays and weekends, except when all-day excursions to local tourist sites were scheduled.

The classes alternated, beginning with the Art class, then an Engineering Technology class, followed by the History class, and then the other Engineering Technology class. There were problems with computer compatibility, Internet access, etc., that were not completely resolved, even with the help of the NJU Information Technology personnel. Thus, classes were largely taught using the traditional whiteboard methods, rather than PowerPoint slides.

At Nanjing, students began to really experience the Chinese culture. They ate breakfast in the NJU student cafeteria and most meals were on their own in the city. This allowed them to explore the variety of eating and entertainment establishments and street vendors. Students learned to move around the city, either by walking or using local transportation, mainly taxis or busses. Students learned to communicate with the aid of a few Chinese words and phrases that they learned along with translation books and sign language.

One whole day was devoted to lectures presented by NJU professors. Professors gave presentations on Chinese Language, Music, Legends, Geography, and Cooking. A visit to the Nanjing Art Institute (NAI) allowed the University of Dayton students to interact with NAI Art students who translated the UD students' English names into Chinese names. The NAI visit included presentations by Art Professors, and a famous Chinese artist painted original pictures for each student. This was followed by a visit to a musical performance at the Institute.

Suzhou

After Nanjing, the group went to Suzhou, specifically the Suzhou Industrial Park (SIP). SIP is a master planned community that borders the city of Suzhou. Over 200 foreign-invested enterprises have committed to the community. When fully developed, the SIP will accommodate a population of 600,000 and provide jobs for 360,000 employees. The group stayed in the modern SIP hotel and a classroom was reserved for us at the Higher Education Town. Hsu³ indicates that international alliances develop student learning in ways not learned in traditional educational settings. The University of Dayton has formed a 3+1 agreement with Shanghai Normal University (SNU). At Suzhou, six students from SNU joined the group from UD. Although Chinese people are known for forming relationships with foreigners slowly, the SNU students quickly melded into our group. They attended all our classes and participated in hands-on classroom group exercises and accompanied the UD group on plant tours. Tours of manufacturing plants in Suzhou included the He Jain Technology Company, Ltd., Emerson-Copeland, and Delphi Corporations. The format for the plant tours was similar to that discussed previously for NCR Beijing. Information learned on the tours of Chinese plants was with blended with textbook material and compared and contrasted US manufacturing and management methods. The last part of the trip was spent in Xian and Shanghai.

Creating Cultural Awareness in the Curriculum

For programs desiring to start a course similar to IET-415, the syllabus is included as Figure 1. If not considering a similar course, then programs could start by identifying courses in their curriculum where cross-cultural concepts can be integrated. Two approaches can be taken, first, integrate examples and discussions of foreign country and business practices appropriate to the course. In this approach, each faculty member needs to find and utilize examples that relate to their course material. Here, implementation falls to the interest and imagination of the individual faculty member. Depending on the level of enthusiasm, this can sometimes result in a rather disjointed effort. Strong departmental leadership and interest are keys to success.

The second approach is to realize that these courses would also be candidates for teaching in a Study Abroad program. Establish a relationship with an appropriate university. This takes time, effort, and connections. Look for those connections through your graduates, they often work for organizations with multi-national ties. After establishing the connection, meet with the faculty and determine which courses would be most suitable for both participants. Closer to your visit, ensure that facilities for both faculty and students are available on campus during the required period of time. Careful planning ahead of the visit will enable you to enhance the course offerings with plant visits and cultural exchanges. Contacts to arrange tours of overseas plants

can be obtained from industry colleagues, Alumni, and Industrial Advisory Committee members. Establishing such an experience takes time and cooperation, but it is highly beneficial to all participants.

Students' Evaluation of the Trip

Students' evaluations of the trip were very positive. All the students indicated that they learned a lot about working with people from other cultures. The students rated the study abroad 3.92 out of 4.0 points. Some of the students' comments include:

“When I came I had several ideas of what to expect about the Chinese. I came to find out that most of them were not true.”

“I learned that there are many alternatives to the “Western” way of business. It can be advantageous to look at other cultures and their methods and tactics.”

“Getting to see first-hand what the Chinese are doing and how they prepare to get these things done, only makes me want to prepare as best I can, because their future looks extremely promising if it continues the way it was.”

“Overall, this trip has broadened my perspective on how business is done internationally, and how management can be handled. Before this summer, I would never have expected to see an American or other non-native employee managing any foreign companies. Now, I know that with the right structure, cultural barriers can be understood and dissolved without having an overwhelming negative impact on a certain society.”

“I learned as much about myself during this trip as I learned about China...I realized the things that were important to me were often brushed aside to do things that I didn't care for. I found out in China that I can be happy without going out of my way to have a good time. Seeing the humble lives of the Chinese and low-key manners, I don't really believe anymore that spending more time on my technical interests will make me and my life boring.”

“In addition to reinforcing my believe that stereotyping is rarely right and learning to keep my surroundings in mind, as well as appearances can be deceiving, I have concluded much. Speaking on a technical side, business is run differently, people think differently, and people respond differently in different areas of the world.”

Future

Based on the success of this pilot trip, another summer study abroad trip to China is currently being planned. Beginning summer of 2006, students from SNU will come to UD to complete the last year of a degree in Engineering technology. A new International Residential Learning Community is planned to begin in the fall of 2006. This unique community is being developed for American and International students who want to have an international/intercultural living environment. The students from Shanghai Normal University will live in this community during

their time at UD. This will enhance the cultural experience of both American and International students.

Conclusions

With the constantly expanding global industrial opportunities, faculty must develop experiential opportunities for students to create a deeper understanding of the cultural interactions that they will face⁵. Combining classroom work with a study abroad can be an effective way of accomplishing this goal. Classroom material can make students aware of the need to be able to work in an international environment, but the study abroad provides the experiential learning that cannot be duplicated in the classroom. This two pronged approach to creating cultural awareness and understanding was extremely effective in helping to prepare students to work in the global economy.

Bibliography

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**IET 415
COURSE OUTLINE**

COURSE NUMBER AND TITLE: IET 415 Management of Technical Organizations

CREDITS AND CONTACT HOURS: 3 semester hours, 45 contact hours

COURSE DESCRIPTION: Study of the structure of industrial and service organizations; study of the duties and responsibilities of a manager or supervisor in a technical organization in developing an effective project or production team. Study of labor administration; labor legislation and current labor practices.

PREREQUISITES: None

CO-REQUISITES: None

TEXTBOOK: Schermerhorn, J., Core Concepts of Management, Wiley, 2004

COURSE OUTCOMES:

Upon successful completion of this course, students should:

1. Understand a variety of organizational structures and how work is performed within these structures.
2. Develop a working knowledge of current business management practices and understand the effects of globalization on organizational competitiveness.
3. Understand compensation practices and wage determination.
4. Develop a working knowledge of teams and teamwork, such as how to get the most from their performance and how to increase their effectiveness.
5. Be familiar with the history of organized labor, collective bargaining agreements, and grievance and arbitration procedures.
6. Understand and utilize basic concepts related to negotiation.
7. Understand basic concepts related to personnel management.
8. Understand basic how social responsibility, ethical conduct, diversity, cultural and other current business issues influence organizations.

MANAGEMENT TODAY

- | | | |
|---|---|-----------|
| 1 | Management Today | Chapter 1 |
| 2 | Organizational Structures | Chapter 8 |
| 3 | Current Topics in Employment Environment, Diversity, and Competitive Advantages | Chapter 2 |

GLOBALIZATION AND INTERNATIONAL MANAGEMENT

- | | | |
|---|--|-----------|
| 4 | Globalization and International Management | Chapter 3 |
| 5 | Ethical Behavior and Societal Responsibility | Chapter 4 |

Test 1

PERSONNEL MANAGEMENT

- | | | |
|---|-------------------------------------|------------------------------|
| 6 | Time Management | pgs. 70-71 |
| 7 | Communication | Chapter 14 |
| 8 | Compensation and Wage Determination | Supplements, Chapters 10, 12 |

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|----|---------------------------------------|-------------|
| 9 | Managing Personnel | |
| | Teams and Teamwork | Chapter 13 |
| | Change Leadership | Chapter 15 |
| | Controlling to Ensure Results | Chapter 7 |
| | Test 2 | |
| 10 | Labor Legislation and Employee Rights | pgs. 159-60 |
| | Wagner Act | supplements |
| | Taft-Hartley Act | |
| | Norris-LaGuardia Act | |
| 11 | Collective Bargaining | supplements |
| 12 | Negotiation | pgs. 227-29 |
| | Test 3 | |

Presentations

Two in-class presentations are required for this course. One presentation involves discussing a current labor topic. The second presentation involves presenting information about a foreign country.

Presentation #1: Current Events.

Please select a current magazine or newspaper article related to the course material. Prepare to present and discuss the article with your classmates on your appointed day. The class period prior to your presentation, please provide your classmates with a handout which briefly summarizes your topic. Articles may be selected from reputable newspaper, internet, magazine, or news program source. Articles must be approved by the professor. Provide a copy of the article for the professor.

Presentation #2: Countries

Please select a country from the list provided. Prepare a presentation containing information that a business person would do well to remember when doing business in that country. Your information should include: business etiquette, cultural orientation and context, business practices, negotiation practices, business travel, business entertaining, protocol, gestures, and customs such as greetings, working hours, dress, formality (or lack of it), meal etiquette, meeting situations, and the cultural differences for males and females. Be prepared to compare and contrast your country with other countries including the U.S.

Figure 1 IET 415 Syllabus