

Bridging the Global Gap between Academia and Industry-An Experimental Study in IT Development

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Abstract---The dynamics of Information technology development has changed nationwide and globally. Finding effective processes through which to develop software is critical to computer science education. The IT industry in China continues to expand rapidly and innovatively, not only in terms of outsourcing, but also in the research and development area. This paper reports an experience and examines the process in developing and teaching a study abroad program that strives to close the global gap between CS education and IT development.

Keywords--- global IT development, computer science education, study abroad

I. INTRODUCTION

INFORMATION Technology is dynamically and rapidly changing as an academic discipline. To stay current, the information technology curricula in universities must be dynamic and responsive to the IT advances and the global business trends. The information technology program at Webster University has gone through a continuous readjustment and improvement to transform some of its courses from the traditional classroom learning format to an E-learning environment. Furthermore, an international study-abroad component, as a part of the course contents, has also been included in many courses. It is a challenge to extend the traditional classroom dimension of an information technology course so that American students will step out of their comfort zone of their home country. Many benefits can be gained by experiencing the globalization in IT development and exploring aspects of diverse culture and society which represent a distinct contrast to the western world.

Being a worldwide institution, Webster University's mission is to "*ensure high quality learning experiences that transform students for global citizenship and individual excellence.*" [1]

COAP 3010/ITM 5900 Global Information Technology Development in the Department of Mathematics and Computer Science was a brand new hybrid course that was developed with Webster University's mission in mind and a

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global perspective to support Webster University's academic environment and to challenge both undergraduate and graduate students in transforming for global citizenship. This course combines online learning and short term travel components. The underlying principle of the course is to encourage students to assimilate into the international experience by traveling across borders to witness first-hand business and IT industry in action.

Aligning with the university mission, this course offered students opportunities to advance their learning through immersive travel experiences to China where the IT development is booming. On-site visits to leading technology companies in Hong Kong, Shenzhen and Beijing provided students with first-hand business knowledge and a direct cultural experience of Asia. Within these corporate visits students were provided an opportunity to interact directly with industry professionals, facilitating a first-hand exposure to cultural issues and various other challenges faced in international business and global technology development. Further, through studying significant technological advancements in China, as well as cultural effects on IT development, the course exposed students to the ways in which the IT industry and business are conducted in eastern countries [2].

II. COURSE COUTCOMES AND COMPONENTS

A very critical aspect of the IT industry in Asia is the outsourcing of software projects – typically collaborations between Asian and western companies [3]. Effective management methodologies are significant to ensure offshore projects are implemented successfully since the process of outsourcing presents many obstacles in many regards [4].

With the above goals in mind, very specific learning outcomes were identified for this course. Upon the completion of this course students will be able to:

- Demonstrate an awareness of globalization
- Demonstrate knowledge of cultural factors impacting technology development
- Demonstrate knowledge of software development processes

- Explain challenges in developing software with geographically dispersed teams
- Explain the impact of outsourcing on software projects
- Demonstrate fundamental knowledge of Chinese/Eastern culture, people, society, and business practice

These outcomes served as a guideline to construct course components and evaluation methods.

The components of the hybrid course consist of six weeks of online learning and two weeks of travel to Hong Kong, Shenzhen, and Beijing. Activities specified in the curriculum include weekly reading, video-taped lectures, weekly discussion focus, weekly assignments, group research projects, and an individual report produced at the completion of the travel.

A. Research Projects

Since we emphasize the corporation visit and research projects as the highlights of the course components students were required to conduct their project based on the following subjects:

Cultural and Language Issues in Outsourcing:

Examine language/culture barrier issues in a software development environment, examine or discover the interconnections between different societies and values, and their impact on offshore software development.

Business Ethics:

China faces many challenges of ethical dilemmas. Students were asked to explore the similarities and differences in business policy and decision making and to review common ethical ground among businesses, and to address concerns in standardizing corporate governance, quality assurance, and intelligence ownership. Further, investigating how to tackle technology theft issues and violations on copyright was recommended.

Remote Management in Outsourcing:

This project was intended to review the many challenges associated with remote management in outsourcing such as communications between business partners, management standards and ethics, consistency/inconsistency of corporation regulations.

Investigations of China's Advancement in IT and R&D:

This project was designed to investigate China's transformation and innovations in IT and R&D in the 21st century. In turn it helped to understand China's policies, strategies and development in the global economy.

Software Development Methodologies:

A project aimed at investigating "Agile methodologies" (Shore 2007) which represent a major transition in the evolution of software development techniques, and have become increasingly prominent in the global software industry.

IT Security:

A project designed to review common security issues in international communication and cross-border collaboration. Strategies for managing these were to be evaluated.

B. Corporate Visit

A variety of types of industry and an academic institution was arranged to expose students to the technologies being developed in China, and to give a greater understanding of the ways in which business is conducted. Each visit was designed to introduce a slightly different perspective on technology development, and to raise awareness of the common challenges faced when conducting business in China and in collaboration with global organizations. Corporate visit provides a live experience for students to witness first hand production in IT development. The corporate visits included:

Hong Kong Metro Control Centre:

The MTR Corporation was established in 1975 as the Mass Transit Railway Corporation with a mission to construct and operate an urban metro system to help meet Hong Kong's public transport requirements.

Hong Kong Science Park:

Established in May 2001 and offers one-stop infrastructural support services to technology-based companies. The 22-hectare park is located in Pak Shek Kok and serves as a regional hub for technology innovation and development.

Hang Seng Management College:

A leading private institution providing opportunities to local students to pursue degree education.

Foxconn:

An Apple partner in China, which is also famous for its nanotechnology, heat transfer, wireless connectivity, material sciences, and green manufacturing processes.

Huawei:

The largest networking and telecommunications equipment supplier in China and the second-largest supplier of mobile telecom infrastructure equipment in the world.

China Unicom:

A telecom company that operates fixed and mobile communication services in the nation and across Asia. China Unicom is also an Apple partner in China.

Oracle Beijing:

The Oracle Beijing Campus, located in Haidian district in ZhongGuanCun Software Park (ZPark), China's Silicon Valley, and is Oracle's cornerstone in China.

Microsoft Research and Development Beijing:

Microsoft's research and development center conducts fundamental, curiosity-driven research with the goal of realizing Microsoft's vision of future computing.

Founder International:

The Founder Group has come a long way to become a well-known IT enterprise in China advocating technological innovation. It has over 80 wholly-funded companies and joint-ventures both home and abroad.

The opportunity to interact directly with Chinese IT professionals would only be possible through corporate visits. Indeed, each of the student learning outcomes for the course was directly impacted by the corporate visits and the face to face discussions with the global IT professionals.

C. Cultural Activities

Effective collaboration can only truly be achieved when a sufficient level of cross-cultural understanding has been reached. The outcomes to achieve culture understanding were defined as: students will demonstrate an awareness of globalization; knowledge of cultural factors impacting technology development; and fundamental knowledge of Chinese/Eastern culture, people, society, and business practice. Through these activities we were able to expose students, some of whom had never travelled outside of the United States, to the life of the local population. Moreover, with the help of local connections, students were able to sample many local food delicacies off the typical tourist paths – something that a regular visitor would not be able to experience. We firmly believe that this exposure provides an even greater appreciation for the local way of life, and enables students to relate to the Chinese people in a far effective way. Given the cultural foundation acquired through the visits, we observed that students were able to interact more effectively with individuals in a corporate setting. The benefits of cultural effect was observed immediately as quoted from students:

“You can read and/or study about the Chinese culture and companies that are based in Hong Kong, Shenzhen or Beijing, but to travel to China, speak face-to-face with corporations and to literally ‘walk in the Chinese footsteps’ has made me respect their culture and how to better deal with some of their business issues.”

“... the result was a lot of corporate and cultural experiences that have added a great deal of value to this course and have also opened my eyes to the Chinese culture for my future business endeavors”

Clearly, if such an impact had been made within a few days, their ability to collaborate going forward would be even greater.

III. DISCUSSION

A significant component of this course is to offer students opportunities to advance their learning through immersive travel experiences in Hong Kong, Shenzhen and Beijing. This course served its purpose in combining online academic learning with on- ground travel that provided students with a live experience to see how global IT development and production perform in China.

The overwhelming sentiment from this course was one of great success. We believe that through the combination of corporate visits and cultural activities, each of the learning

outcomes was met. The student projects ensured that all students not only investigated a specific aspect of global IT development, but also had a goal in mind during the corporate visits. This goal actively encouraged the students to interact with presenters from the various corporations, and initiate a healthy dialogue. Feedbacks and testimonials obtained from students regarding their experience are exemplary:

“The trip to China was awesome in so many ways for me. As I have stated before, having the opportunity to actually experience what has been spoken or taught to me in several post-graduates classes in regards to China has been just another true experience for me traveling abroad.”

“I was able to meet people I otherwise would have never had an opportunity to meet. I loved how diverse the group was, having a different point of view helped expand my view point and I was able to learn more.”

“Besides my personal liking I also had the chance to network with business people in all three cities. I see a lot of possible collaborations between us and potential partners in China. May it lead me to a successful business!”

“Seeing a country that unifies traditions and modern technology in such a way was a very valuable experience. I met a lot of great people, learned new facts about the global and Chinese IT market.”

IV. CONCLUSION

In the era of globalization, changes in business dynamics impose a great effect on academia. IT development and computer science education must evolve to incorporate an awareness, critical technical knowledge and business understanding of an increasingly global industry. COAP 3010/ITM 5900 Global Information Technology Development was designed to reflect the global nature of IT discipline and strived to fulfill the gap between academia and industry that usually exists in the IT development curriculum. A direct communication and collaboration with global IT industry professionals provided a great benefit in bridging academic learning with real world industrial experience.

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