

International Partnership in Engineering Education

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Abstract

Many companies are engaging in international businesses due to rapid growth in the global engineering market. Communication skills and cultural awareness are very important for working in multicultural teams for multinational corporations. Currently, many universities in Asia and other parts of the world are offering their master's degree programs in the English language in order to serve the industry and to fulfill the socio-economic needs of the population. Many foreign universities are interested in collaborating with American universities to enhance their program. Those foreign universities, which allow study abroad, have become more competitive. Offering one-semester study in the United States to students in foreign partner universities will benefit both foreign and American universities. Our paper will address these issues and focus on those benefits that can be achieved from partnering institutions of higher education. The students from the foreign universities will receive the most invaluable experience while studying in the United States. Students will have great opportunity to enhance their educational objectives. In addition, they will also improve their English skills. Only a few students can afford pursuing graduate study abroad because it is very expensive. Since the one-semester cost is more affordable, it will provide opportunity for more students to gain experience under such a program. The universities in the United States will get more income from their foreign counterparts. The exchange program may be only limited to summer semesters. This option will also help the U.S. institutions, particularly when the numbers of American students enrolled during summers are reduced. By partnering with the foreign universities, the host university's reputation will be recognized worldwide. The creation of student diversity from different countries will create a multicultural environment from which students will benefit. Furthermore, the program creates cultural understanding that becomes an asset to the international competitive market. The benefits of abroad studying are highly recognized now; however, the drawback to this program is often based on self-initiative by students. Universities need to become more active in promoting international exchanges. Cooperation among institutions is essential for successful implementation of the one-semester program.

I. Introduction

Study abroad is an essential component of higher education. It provides an opportunity for students

to overcome the cultural differences in other countries and develop their personalities that cannot easily be acquired through course work alone or be obtained as a tourist. With the development of global market place, more and more companies are doing businesses overseas. Many engineers are now practicing on a global rather than a local or national basis. It is important for every engineer to understand how the engineering industry operates on a global basis. It is also vital that the engineers have both international knowledge and a solid background in engineering subjects to be successful in an international environment. Communication skills and cultural awareness are very important for working in the international organization. These skills can be acquired from the exposure to study abroad programs before graduation.

II. Benefits of Study Abroad Program

Students will gain experience and knowledge by living abroad. In addition, they will learn about people's perception, develop tolerance, and maintain flexibility of living in an environment with which they are not familiar.

In an engineering environment, communication becomes an essential skill when working in a team. With the globalization of the marketplace, the 21st century offers opportunities that go beyond the borderline of any country. Knowing more than one language becomes a positive impact in building one's career. In major projects around the world, multinational groups of engineers work together. In the United States, foreign students will have opportunities to learn and practice English both inside and outside the classroom. This situation will force them to improve their language skill rapidly. American students will also have an opportunity to learn and practice foreign languages with international students outside classroom.

Students who have the opportunity to work in a team project combining with students from several countries in their graduate courses will have a better understanding of the role of teamwork in their future international work projects. For instance, students will face problems that may be similar when working with multinational teams. They are language limitation, differences in cultures, attitudes, and perceptions. A friendly classroom atmosphere will provide opportunity to expose the international experience and learn how to work in a diversified environment. Both American and foreign students will learn how to adapt themselves to get their work successfully done.

International students need to manage their everyday life, study habits, and learn how to make decisions on their own when they live alone in the United States. International students develop more self-confidence, maturity, self-discipline, independence, time-management, and tolerance. These personal characteristics are acquired because of participation in the study abroad programs.

Another important benefit of the program is that students will have opportunities to make new friends and establish network in a foreign country. Since graduate students have a higher potential for management level positions, a network of friends may lead to business partnerships in the future.

The creation of student diversity from different countries and cultures is very important in understanding people. Such diversity creates a better perspective in a classroom environment, which leads to classroom interaction; and, this may result in new directions of teaching and research.

The technical expertise (e.g. computer skills, advance construction and equipment techniques, etc.) that international students receive during the study abroad could ultimately benefit American companies that operate overseas. The availability of technical expertise may result in cost saving. The American companies can hire native experts at a lower cost because the average salary of engineers in developing countries is generally much lower than that of American engineers. Moreover, the companies can save a lot of money from relocation expenses.

The college tuition fees in the developing countries are normally much lower than developed countries. The tuition fee is set in the reasonable range for the native people. The lack of funds is a major constraint in developing countries. Without funding, universities in developing countries are not able to update their laboratories or offer courses comparable to developed nations. Furthermore, the computer facilities, both hardware and software, are limited. Their libraries are lacking many new books and journals. By studying abroad, students will have a chance to study in courses that may not be available in their home country. Their library access is unlimited in the developing countries. This provides foreign students with the opportunities to use their own talents to build upon their knowledge and research skills.

Students will always remember and greatly value their memories of living abroad. The experience gained from living abroad will enable them to communicate better with their business counterparts. The business climate of multinational corporations will be enhanced by hiring students with international experience because they are more equipped to handle real-life problems which they will encounter in multinational engineering corporations.

III. Option of One-Semester Abroad Study

Study abroad is very expensive. Many people can not afford it, especially those in developing countries. One-semester of studying abroad is considered an alternative because it is more affordable to international students. International study programs in the university curriculum are quite common but they are comparatively rare in the field of engineering, especially for graduate level students [1]. Once a student has enrolled in an engineering program, it is difficult to get an opportunity to study abroad. Many foreign universities do not offer study abroad programs in Engineering curriculum. For those who want to study abroad must get approval by professors. It is often based on the self-initiative of a student. Therefore, universities need to become more active in promoting overseas study. In order to encourage students to study abroad, universities need to incorporate the study abroad program as an option in their catalog. Study abroad is no longer a luxury item in the college program because it has become an educational and occupational

requirement in the globally interdependent world [2]. Most foreign students are attracted to universities in the United States because of their prestige, advancement in technologies, and the English language used in the classroom environment. Since most students learn English as a foreign language in their schools, it is natural that they will attend those institutions that offer the study abroad program.

In the study abroad semester, the students would pay the same tuition fee to the host university as other international students. This equality in tuition fee will attract more host universities to become partners. These partnering universities could also profit by allowing more international students into the program. More students would participate in these one-semester study abroad programs if the TOEFL and GRE requirements were lowered. However, the foreign universities need to offer more English courses to their students in order to improve their English language skills prior to acceptance in the study abroad program.

The host universities may offer the one-semester program only during the summer semester. At this time, their student enrollments are low. The tuition fee from the foreign students in one-semester abroad study program will be a good source of income to the partnering universities. For example, Australia decided to treat education as an international trade industry in 1985, and by 1994, it was earning over a billion U.S. dollars a year from foreign students [3]. In addition to earning income, the university's reputation will be enhanced and recognized worldwide.

The commitment and cooperation of the faculties from both institutions will play a major role in the successful implementation of such a program. Officials from both institutions may travel the world and sign any number of contracts. Faculty members also need to be involved in the process. The curriculum and educational quality of the foreign countries should be related with the partnering universities. Thus, the foreign students will have enough knowledge and feel more confident in the Engineering subjects without falling behind in the curriculum while study abroad. The native and the foreign universities must work together to come with an agreement of what courses will be available to the foreign students.

The continuation of the program needs to be considered. After returning home, the available courses should provide enough alternatives to students to enroll in the courses that are different from what they studied in the host universities. Study abroad credits should be transferred and counted towards the degree requirements in the foreign country. Otherwise, students will not participate in the study-abroad program. A degree will be awarded to foreign students by their native universities.

IV. Examples of Short-term Study Abroad Program

Engineering schools from around the world have established partnership with institutions in the

United States and other countries to send students to study abroad. However, most of these programs are available only for undergraduate students. For example, Middle East Technical University in Turkey (METU) has made agreement with the partner university in two types. The first type is exchanging students between METU and the partner universities on one-to-one basis. A student from METU will study in the partnering university while accepting one student from the partnering university to study at METU. The other type is accepting students from METU as the “visiting students” for studying at the host universities for one semester or an academic year. For the first type agreement, exchange students pay tuition to their home university and are exempt from fees at the host universities. For second agreement, visiting students go as non-degree students for a period of one semester or academic year but pay their tuition fees at the host universities. Several universities arrange for in-state tuition for visiting students. [4]

The National University of Singapore (NUS) offers a one year study abroad program with partner universities around the world to its undergraduate engineering students. The students pay the normal NUS fees and their own airfare and living expenses. If students are interested in study in non-English speaking universities, the students are recommended to take intensive one-month language courses at the host universities. [5]

Students at the Technical University of Denmark (DTU) are highly encouraged to take one or two semesters study abroad because they are increasingly employed in jobs that require international partners. Approximately 30 percent of DTU’s students spend at least one semester abroad during their study time of 5 years. Since DTU considers internationalization to be an unavoidable and necessary process to pursue, the objective of having all students spend at least one semester abroad earning credit points to be added to their record at DTU by 2010 was set. [6]

The agreement between Milwaukee School of Engineering (MSOE) and the FH Lubeck (FHL) involves switching studying periods between two universities. Most courses of this study program are offered in English, even those that are held in Lubeck. MSOE-students come to study at the FH Lubeck for two semesters with FHL-students. After these two semesters in Germany, MSOE-students finish up their last year of study in Milwaukee, while their German classmates follow them after their on-the-job training. The students spend their last two semesters at the MSOE. After passing the degree examination, the students receive their final diploma from both MSOE and FHL. [1]

V. Conclusion

For those industries that are actively participating in the global market place, the need for students under study abroad program may be substantial. Study abroad is an investment of the future. One-semester study abroad is an alternative choice that offers the opportunity for engineering students to get international experience in a cost-effective way. Study abroad provides tremendous benefits to students; therefore, this program should not be provided only for undergraduate students, but also for graduate students. The success of partnerships between native and foreign

universities under study abroad program will produce greater results than what are described here. The globalization of the market place is a driving force that demands the establishment of study abroad programs. For any country to compete in the global market, they need to build a bridge for communication and better understanding. Study abroad may lessen the culture gap and bring people of different nations closer together.

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