New Initiatives for Aviation Study Abroad Programs

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Abstract

In 2002 the Aviation Department of Purdue University started a study abroad program. The industry advising committee had emphasized that the aviation industry was quickly becoming a global industry, and new graduates would have to interact and cooperate with people in many different countries. Faculty at Purdue University explored multiple options for study abroad. The most successful of these efforts was the development of a 10 day aviation tour of Europe, organized each year during spring break in March. However, the tour could accommodate only 32 students and faculty felt more students would have liked to participate. This paper discusses the evaluation of past efforts and the development of a follow-up plan to increase study abroad participation within the Aviation Technology Department. At the time of initiation, about 30 students per year were involved in study abroad programs. A new goal to increase this number to 60 students was set. Recently a 10 day aviation tour of Asia was developed with the first tour scheduled to begin during Spring break of 2009. Additionally, a three week maymester course in Europe is currently under development with the first course offering targeted for May 2009. A new plan for increasing student participation in study abroad programs began with a preliminary survey of the students and faculty to determine their attitudes towards study abroad. It was found that one of the major obstacles for student participation in the programs was high cost. Therefore, a fundraising effort was initiated enabling more students to take part in this opportunity. Concerns expressed by faculty on going abroad centered on avoiding long periods of time required away from their normal classes. Faculty reported they would not mind spending a short period of time abroad, ranging from 10 days to 3 weeks, but most were opposed to spending a complete semester abroad.

Keywords: educational travel program, globalization, international internship, partner institution, student participation, study abroad program

Introduction

The globalization of aviation maintenance has impacted the education and training needs of the aviation workforce. Engineers and managers of tomorrow will be expected to function differently from today as they face new ever changing work environments that include multicultural work environments, multi-national outsourcing and new automation technologies. This is not necessarily a new problem. Take for example the development of aircraft during the first part of the 20th century. Early aviation developments enabled business people to travel further and faster than ever before. At the beginning of aviation aircraft were British, French, American or German built and the aircraft industry represented a country's engineering innovation and pride. This has changed over the past decade. For example although many people consider Airbus to be a European aircraft manufacturer, half of its financial investments for aircraft manufacturing are made in the United States. Many Americans (Garvey, 2005) consider Boeing to be their national pride, but companies in China, India, Japan and Europe make many parts for Boeing aircraft models. Therefore two compelling reasons for aviation maintenance managers to have an in-depth knowledge of globalization issues are: continued outsourcing of aircraft maintenance and repair to countries outside the United States, and the increased importance of a global supply chain for new aircraft manufacturing programs.

Training of managers to work with a global perspective

Industry, government and academic leaders (Hirleman et al, 2007) have strongly emphasized the need for United States schools of engineering to matriculate globally competent engineers. Study abroad helps to build mutual understanding among nations, and serves to promote national leadership in the United States, international effectiveness, and economic competitiveness by helping to create a globally literate citizenry. Teaching global competency has become imperative for schools of engineering. Corporations are competing in an international, knowledge-driven economy and many are adapting by creating engineering consortia that blend team members from several nations. The relationship between these multinational team members is critical because a corporation's investment into an overseas technical assignee can exceed $1 million. Despite these major investments (McNulty and Tharenou, 2004), 44% of multinational companies report failed expatriate assignment in the Asia-Pacific region and 63% of companies report expatriate failures in Europe.

Globalization experiences in college

According to President George W. Bush, "America's leadership and national security rest on our commitment to educate and prepare our youth for active engagement in the international community", and according to former President William J. Clinton, "Today, the defense of United States interests, the effective management of global issues, and even an understanding of our Nation's diversity require ever-greater contact with, and understanding of people and cultures beyond our borders" (The Abraham Lincoln Study Abroad Program, 2007). Mr. Durbin and Mr. Coleman introduced the Abraham Lincoln Study Abroad Program bill to the Committee on Foreign Relations. The purpose of the bill is to encourage not less than 1,000,000 undergraduate students in United States institutions of higher education to study abroad for academic credit within 10 years of the date of enactment of this Act (The Abraham Lincoln

Study Abroad Program, 2007). The National Academy examined the globalization issue in a recent report entitled *Educating the Engineer of 2020: Adapting Engineering Education to the New Century*, concluding, "United States engineers must become global engineers .... The engineer of 2020 and beyond will need skills to be globally competitive over the length of her or his career." (Committee on Engineering Education, 2005) The National Association of State Universities and Land Grant Colleges' Committee for International Education (NASULGC), which was composed of a variety of academic leaders from all fields, prepared a summary of the characteristics that define a globally competent student. In sum, the committee concluded a globally competent student has the following five characteristics: (a) has a diverse and knowledgeable worldview, (b) comprehends international dimensions of his/her major field of study, (c) communicates effectively in another language and/or cross-culturally,(d) exhibits cross-cultural sensitivity and adaptability, and (e) carries global competencies throughout life [6]. Incorporating global competencies into the engineering curriculum will require additional investment by universities.

The United States repeatedly falls short on indicators of international knowledge, awareness, and competence. Despite such shortfalls (DeLauder, 2004), schools of engineering are increasingly expected to prepare globally competent engineers. Hirdeman et al (2007) found four methods that can effectively integrate globalization into the daily engineering curriculum. These methods are:

(a) adding a topical course into the curriculum,
(b) strengthening the language requirements within the curriculum,
(c) incorporating international case studies into existing technical courses, and
(d) infusing study abroad opportunities with engineering-based teamwork.

Although 75% of students think it is important to study or participate in an internship abroad during their academic career, less than 1% of all enrolled American undergraduates study abroad. Of these participants, engineers are among the least represented. The majority of students who study outside of the US are students in the social sciences, humanities, and foreign languages, while students who major in engineering, business, mathematics, computer science, or education are underrepresented in study abroad programs. Within the total enrolled United States undergraduate population (Commission on Abraham Lincoln Study Abroad Fellowship Program, 2007), approximately 10.7 percent of United States students majoring in business have studied abroad, 8 percent of United States students majoring in engineering have studied abroad, and 5.9 percent of United States students majoring in education have studied abroad.

Company provided globalization training

Brown (2006, p. 9) states that organizations must put more emphasis on cultural diversity and institutionalize rules for promotion. For example, promotions will only be awarded if one has lived and worked in multiple environments. The rise of Asia, Latin America and Eastern Europe into the international aviation market will bring to the forefront new corporate norms, organizations, and business executives. Managers who will succeed in this new world order for aviation will be those who embrace traditional concepts of leadership, such as mentorship and succession planning, while also being fluent in a new global, corporate language. Marquez (2005, p. 50-52) found that companies are discovering that leadership does not come ready-made, and leadership can not be developed only through reading or study. Hands-on experience has proven crucial for companies. A key reason for the return of expatriates before

the official end of their foreign assignment is the uncertainty and frustration resulting from poor cross-cultural adaptation. Jassawalla, Truglia, and Garvey (2004, p. 836-837) found that the implications of a study of cross-cultural conflict and expatriate manager adjustment included: (a) selecting expatriate managers with high emotional intelligence, (b) providing extensive pre-departure cultural training that consists not only of cultural facts but also interpersonal skills such as active listening, conflict management, and ethical reasoning, (c) utilizing sensitivity training techniques to better prepare managers for new situations, and (d) sending the expatriate on one or two pre-sojourn visits to familiarize themselves with the host culture and workplace norms even before the actual expatriate assignment begins.

Initiatives of the Purdue University Department of Aviation Technology

The leaders in government, education, and industry have indicated that globalization is a vital part of the education of future aviation professionals. As a result, the last several years Purdue University's Aviation Technology Department has been actively engaged in creating a series of global experiences for both students and faculty. There are few industries as truly global and interconnected as aviation, and students need to learn with a global perspective if they are to be successful in their aviation careers. In 2002, the Aviation Technology Department began a long-term project seeking to integrate concepts of globalization into all courses and curricula, while expanding opportunities and requirements for students to participate in international travel and education. A standing faculty committee was created with the following mission: (a) Investigate the need for globalization of the curriculum, (b) develop globalization strategies, and (c) foster the implementation of these strategies. This committee continues to meet, ensuring this on-going effort is sustained. As part of this initiative the committee developed a long-term plan describing the following globalization strategies which were presented to the faculty. The plan was accepted as a whole, and implementation of recommendations began immediately. The time-action plan developed was to:

1. Create a long term globalization plan *(task completed).*
2. Integrate international and cultural issues into the curriculum *(task completed).*
3. Incorporate globalization graduation requirements into departmental curricula *(task completed).*
4. Develop and encourage student study abroad experiences *(program identification completed, effort ongoing).*
5. Increase student participation in international internships *(ongoing effort).*
6. Integrate globalization activities into the departmental strategic plan *(task completed).*
7. Develop independent sources of income to enhance student study abroad program *(initial stages started, ongoing effort).*
8. Develop and teach aviation specific courses in the Oxford summer study abroad program *(course development completed, courses taught twice, ongoing effort).*
9. Develop and conduct aviation specific international travel and study trips *(development completed, five study trips completed with over 100 students participating, department developing second trip to Asia to commence in 2009).*
10. Develop and implement aviation specific cooperative international education programs *(institutions identified, agreements to be signed, program to begin 2009).*

The first nine of these objectives have either been achieved, are nearing completion and/or are ongoing. The department instituted and incorporated the internationalization of the students and faculty as part of both the departmental and College strategic plans. Most applicable departmental courses now include international components. Increasing numbers of Aviation Technology students are participating in formal study abroad programs as well as international internships. The Aviation Technology specific educational travel program to Europe has been very successful with a trip to Asia coming online in 2009. Aviation specific courses have been also taught at Oxford and faculty exchanges have been facilitated with the Civil Aviation University of China (CAUC).

The Aviation Technology department now requires that every student meet a specific globalization requirement in order to graduate. As part of their academic career, every one of the 600 students will be required to complete one or more internationalization activities to graduate. Faculty would prefer all students to study abroad because research and personal experiences have shown that the hands-on experience is more effective than taking a language or humanities course. Additionally this travel incorporates fun recreational activities within the local culture, making the course less likely to be viewed by students as just another requirement or a waste of time. The goal is to take students on a spring break study abroad experience during their freshmen or sophomore year, exposing them early on to international travel and study abroad opportunities. This would be followed by a summer study abroad or internship during their junior year.

At the onset of the study abroad initiative, the goal was to reach a larger audience for the study abroad trips than the previous average of just 5 or 10 percent of the student population. Faculty also recognized that if the only activities of the study abroad course centered on visits factories and aviation museums, student willingness and enthusiasm for spending as much as $2500.00 to $3000.00 would be low. A marketing plan was developed to sell the course to a larger student audience with the idea that students must perceive aviation study abroad as a good value. The aviation tour of Europe was deemed successful because a mix of learning and recreational activities immersing them into the local culture in addition to the learning agenda. As an example, in addition to visiting museums and manufacturing facilities related to aviation, there was also a focus on travel and exploration of historic elements of the country such as visiting various cultural and international World War II landmarks.

The spring break study abroad trip to Europe

Faculty members of the Aviation Department officially organized a study abroad course trip, Aviation Tour of Europe (Sterkenburg and Dubikovsky, 2007), six years in a row. The course trip actually consists of two courses: AT452, a pre-trip preparation course meeting once a week for two hours for eight weeks, and SA308N consisting of actual travel to Europe. During AT452 international topics on culture and business practices are covered, also providing a good opportunity for students and faculty to get to know each other. The program began with just 10 students and one faculty member, but has since grown to 32 students with more on a waiting list. The program is very popular with the students and all available seats are filled within a few weeks. Given the popularity, the number has been limited to 32 students, due to transportation limitations and faculty oversight ratios. The plan was to visit London and Duxford Air-museum in the United Kingdom, take a ferry from Portsmouth to Caen, tour the WWII American

Cemetery and Omaha Beach in Normandy, spend time in Paris and finish the tour in Amsterdam. While in one sense such a trip results in a physically demanding schedule, students almost unanimously report that the experience is ultimately rewarding. This is also a good opportunity for faculty to learn about undergraduate students' interests, goals and behavior.

The spring break study abroad trip to Asia

Over the last decade there has been a tremendous build-up of aviation infrastructure in countries like China, India, South Korea, and Singapore. The economies of these countries are growing at a faster rate than many economies in the rest of the world. As a result there are now significant demands for new aircraft in Asian countries. Many large maintenance, repair and overhaul facilities have been established in these countries which perform third party aircraft maintenance operations for western air carries. The development of the Boeing 787 aircraft model as one example has stimulated the global aviation supply chain, bringing large orders to Japanese companies for the manufacture of large composite fuselage and wing sections. Because of the importance of this region of the world for the aviation industry, faculty thought that it would be a good idea to develop an aviation study abroad trip to Japan and China, allowing students the opportunity to experience these very different cultures and examine the opportunities existing in these countries. An idea was to use the same formula for this trip as for the European trip. The aim was to create an intensive 10 day trip that included the same framework of combined learning objectives, cultural experiences, and recreation. In fall 2007, one faculty member visited Japan and toured various areas of educational interest. Results of the exploratory trip were mixed. Travel time from the U.S. to Japan is much longer than going to Europe and the travel costs are much higher. It was determined that it would not be feasible to visit more than one country – such as combining such a visit with a trip to China – as was the case during the European trip. As a result, planning would need to take into account a slightly more limited in-country travel itinerary and higher costs than that of the European trip. With this in mind, while a short term trip to this particular region is possible, the Far East region could also be suitable for a semester long internship program.

Aviation maymester study abroad program in Europe

A preliminary survey of 100 Aviation Technology students indicated 95 percent of students were interested in study abroad. They cited the main reason for not participating in study abroad programs was the high cost associated with these programs. The majority of students also expressed interested in maymester or summer programs that did not extend graduation time.

Based on this information a group of faculty members from Purdue University's Aviation Technology Department have developed coursework for a three week, maymester-like program that could be taught both in the US and at a foreign institution. Teaching these courses at a foreign location while enrolling both Purdue and international students from the host institution provides a more in-depth exploration of the international experience than is possible with the spring break trips. This proposed program will both fulfill the globalization requirement of the Aviation Department and give students the opportunity to take additional course work to broaden their experience.

As envisioned by the faculty, students in this program will eventually obtain nine hours of credit for their experience. Prior to the maymester course, they will enroll in AT 452, which is an international awareness and global cultures course already taught by the department. While at the foreign location, students will enroll in two of the following three courses: AT 300 Global Aviation Systems, AT 258 Air Transportation and/or AT 358 Aviation History (Those courses would be rotated, offered two of the three every year). The courses will be taught in residence at the cooperating institution with the students from both universities enrolled.

There is a plan to offer the first maymester study abroad program in 2009, and investigation is under the way to determine several locations for this program. Faculty would like to work with an aviation institution in the UK or Ireland and use that institution as a base of operations. Students would travel three weekends to cities in France, the Netherlands and other major European countries. They will spend one week on campus at the start of the program to get a head start on the required coursework and to get to know each other. After that they will travel to Europe for three weeks, and during the weekdays (Monday through Thursday) the students will attend classes. During weekends they will travel to other places in Europe to find information for their research projects.

Preliminary school visits and contacts have already been established, and faculty plan to visit another institution in Ireland in the spring. After careful consideration of language problems, scheduling and cost to the students, the departmental committee has suggested that the program initially be established with a sister institution in the United Kingdom or Ireland. Based on previous travels and discussions, two partner institutions in the United Kingdom were identified and tentative agreement was reached with London Metropolitan University and the University of Salford-Greater Manchester University. These two schools have cooperated with each other in the past and are eager to set up joint ties with an American University with an active aviation program. Another option is a university in Dublin, Ireland, which would be a good match for the aviation curriculum. Although Dublin is not as central as London, low cost airfare is available through Ryan Air, which flies to many European destinations from their Dublin headquarters.

Program feasibility

To make the program financially viable, at least 15-20 students would be required to participate in the proposed maymester program. Based on enrollment of the spring break trip and discussions with students, expectations are that at least 10-12 students would be able to travel in the first year. Experience suggests that the number of students will increase quickly once the course is underway and shows a pattern of success. Similar to the spring break offerings, faculty believes the majority of participants will be Aviation Technology students. However hopes are that students from other academic majors within the university will enroll as well.

Cost and external funding

Program organizers anticipate a $3,500.00 fee for the maymester study abroad program including airfare and housing. The fee is not cheap, but students will be able to complete nine hours of college credit and their globalization requirement, and they will not have to pay a separate maymester fee as they would if completing a maymester on the Purdue's West Lafayette

campus. Faculty realizes that high fees are sometimes a hurdle for increasing student participation, and are actively seeking internal and external funding opportunities. Faculty members have contacted Aviation Technology alumni and corporate sponsors for financial support.

Why a maymester structure?

Most students in Aviation Technology are unable to participate in a semester or yearlong study abroad opportunity due to the large number of Federal Aviation Administration mandated courses in the undergraduate curriculum. Course scheduling and limitations in enrollment make it difficult for students to leave the university campus for either a semester or an entire academic year and still graduate in four years. The goal remains to matriculate the students in a four year period wherever possible. This means that the study abroad requirement must be accomplished during spring break, maymester or summer semester. A preliminary internal survey of Aviation Technology faculty indicated most instructors do not wish to be away from home for more than three weeks at a time, and there was little interest spending an entire semester abroad.

What countries are interesting in aviation study abroad?

Traditionally most study abroad programs go to the United Kingdom, France, Italy, Germany and Spain. The reasons students often cite for study abroad programs in these countries in particular are: interesting culture, language, arts, and family ancestry from one of these countries. Statistics from the Purdue University study abroad program indicate that for the year 2007-2008 China is the most popular destination for engineering and management students. A popular country for starting programs for U.S. schools has traditionally been the United Kingdom (UK) because of the language and similar culture. However as other countries, such as China, India and Japan emerge into the world market of aviation with easier access to their educational institutions, new options for collaborating with these countries should be explored. These countries are rapidly becoming recognized as competitive players in aviation maintenance and manufacturing. Exposing students to these environments where the language and cultural differences are more pronounced would provide an excellent opportunity to expand and challenge their thinking and global concept of the industry. As experience with the English speaking countries grows, the study abroad program in the Aviation Technology Department will begin expanding into these countries and cultures as well.

How to increase student participation

Given the importance of international experience for graduates entering the aviation industry, student participation in study abroad programs must grow. Program organizers are targeting at least 50 percent student participation. Two identified avenues for increasing participation in specific aviation study abroad courses are: (a) making study abroad a mandatory graduation requirement, where students would have no choice but to participate. However, it is believed that this is only fair if the institution provides funding sources internally or externally and (b) developing study abroad courses that incorporate learning objectives with recreational exposure to the host country's cultural activities. With this option it has been observed that students are willing to pay higher fees if they are offered a truly unique experience.

Both approaches have been used in combination, where a globalization requirement for language or other related coursework was added and could be taken on campus as an alternative to international travel, and the Aviation Tour of Europe option.

Conclusion

Study abroad opportunities are critical for the future generation of engineers and managers. Universities play a major role in preparing students for a global market place. The Department of Aviation Technology incorporated a globalization requirement in the curriculum and after initial successes a committee of faculty members is expanding study abroad opportunities for the students. Program participants would like to increase student participation to at least 50 percent of the student body and a new spring break trip to Asia and a maymester trip to Europe are scheduled for 2009. A student survey showed the primary reason for students not taking part in study abroad programs is the high costs of those programs. External and internal funding opportunities need to be developed to give all students the chance to participate.

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