AC 2010-1592: A PRELIMINARY REPORT ON UNIFORM OUTCOMES ASSESSMENT OF A COLLEGE-WIDE SET OF INTERNATIONAL PROGRAMS

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A Preliminary Report on Uniform Outcomes Assessment of a College-wide Set of International Programs

Abstract

Globalization continues to be reported as a major industrial trend that will continue and expand. In response, many universities have initiated international internships and/or study abroad programs in an effort to better prepare students for their future work in global settings. This paper presents efforts at Brigham Young University’s College of Engineering and Technology to create and assess new programs to help develop such global competence in our students. An overview of the college’s international programs is first provided followed by a description of learning outcomes for these programs. Assessment results gathered across a set of college programs are then summarized, including survey results from industrial recruiters.

Introduction

Globalization of the engineering profession continues to be reported as a major industrial trend that will continue and expand\(^1\). Many companies are international in scope and the number appears to be growing. Major technological changes have occurred in recent years to help facilitate the globalization of engineering activities. As a result, numerous reports\(^4-6\) have encouraged engineering and technology programs to offer educational activities that promote development of “global competence” in their students. Institutions around the country have responded to these trends and have created a variety of courses and experiences aimed at developing global competence. While a few programs have been in operation for some time, many are new and just beginning to assess their effectiveness.

Over the past five years, the College of Engineering and Technology at Brigham Young University (BYU) has embarked on the development of a coordinated set of educational activities related to this objective of achieving global competence in engineering and technology students. The intent of these experiences has been to improve the ability of our students to thrive in an increasingly international technical environment, and in fact be on a path to developing global leadership\(^7\). These activities have been part of a phased plan that has included piloting of international technical experiences, design of coursework, and development of definitions for global competence, related student learning outcomes and associated assessment tools. The emerging array of international experiences that have been developed by the college faculty have spurred an effort to establish a system of outcomes that would yield the desired global competence\(^8\). In preparation for this refined set of outcomes, the college has studied the results of a preliminary set of assessments that have been uniformly applied to a variety of the college programs over a period of 1-5 years. This set of uniform assessment data has allowed us to compare outcomes from different program models.

The objectives of this paper are to provide a brief introduction to the programs within the College of Engineering and Technology at BYU, describing their structure and learning outcomes, present uniform assessment data from these programs and draw preliminary conclusions on the ability of different program models to achieve outcomes related to global competence.
Program Models

There are a number of possible international experiences that could be deployed to achieve student learning outcomes. To help understand, manage and assess these experiences the college has grouped them into program models with associated objectives. We have defined four models:

1. **Study Abroad Programs**: These are the traditional programs where students spend a term or semester at a foreign location with faculty directors, taking classes and participating in other appropriate activities.

2. **Service Learning Programs**: Service-oriented programs are designed such that the outcomes of the course benefit a needy community in a foreign venue. All such service programs must not only benefit a community, they must also provide a quality engineering experience to the students that are involved.

3. **International Design/Capstone Projects**: International experiences may be integrated with departmental senior design/capstone programs. In this model, groups of students are assigned projects that have international content. In some cases, the students are teamed with students from foreign institutions.

4. **Internships and supervised group projects**: In these programs students work in carefully-selected international organizations as employees for 3-6 months, or under the supervision of a faculty member for shorter one-month group projects.

Learning Outcomes

Learning outcomes for international experiences must be carefully defined and assessed if we are to derive appropriate value from these resource-intensive programs. The preliminary outcomes below address the above program types and represent broad, college-level objectives for student learning.

**Study Abroad Program Outcomes**

Students will:

1. Understand key globalization issues that influence their disciplines, including the connectedness of the world and the workings of the global economy.
2. Appreciate other cultures and learn about communication across cultures.
3. Understand a country’s or region’s context, such as its history, government or economic system
4. Understand opportunities associated with working abroad and gain confidence in their abilities to do this.
5. Be able to place elements of their discipline (water resource management, structural design, product design, manufacturing, etc.) within a global context.

**Service Learning Program Outcomes**

Students will:
1. Learn how to practice a multi-disciplinary design process in the context of a technical humanitarian project and how to adapt the design process to reflect the circumstances of another culture.
2. Be able to implement key elements of leadership and teamwork.
3. Appreciate other cultures and be capable of basic communication across cultures.
4. View themselves as “citizens of the world,” as well as citizens of a particular country; appreciate challenges facing mankind such as sustainability, environmental protection, poverty, security, and public health.
5. Understand key globalization issues that influence their disciplines, including the connectedness of the world and the workings of the global economy.

International Design/Capstone Project Outcomes
Students will:
1. Learn and practice a multi-disciplinary design process in the context of a technical international project and understand how to adapt the design process to reflect the circumstances of another culture.
2. Be able to implement key elements of leadership and teamwork; and be comfortable working in a team of ethnic or cultural diversity.
3. Appreciate other cultures and learn about communication across cultures.
4. View themselves as “citizens of the world,” as well as citizens of a particular country; appreciate challenges facing mankind such as sustainability, environmental protection, poverty, security, and public health.
5. Understand key globalization issues that influence their disciplines, including the connectedness of the world and the workings of the global economy.

Internships and Supervised Group Project Outcomes
Students will:
1. Understand and be capable of practicing basic world-class manufacturing principles in the context of an international professional work environment.
2. Be able to implement key elements of leadership and teamwork; and be comfortable working in a team of ethnic or cultural diversity.
3. Appreciate other cultures and learn about communication across cultures.
4. Understand key globalization issues that influence their disciplines, including the connectedness of the world and the workings of the global economy.

Programs
A variety of programs exist within the college within the framework described above. Short descriptions of each are given in this section. Programs described include both college-wide programs and discipline-specific programs.

Globalization Asia Study Abroad
This is a college-wide program started in 2007 and is offered each spring term (May/June) with a typical enrollment of 16. It consists of a six-week stay in Nanjing China. Undergraduate students are drawn from all majors in the college, and to be eligible, students must have taken major courses within a program (no
entering freshmen are accepted). During the study abroad term in China all 
students take two courses which are held on the campus of Nanjing University. 
The first course (3 credits) focuses on the study of globalization and how it 
interacts with and affects engineering and technology. This course is taught by an 
engineering college faculty member who also serves as the program director. The 
globalization course consists of readings, discussion, organized debates, and a 
term project on the topic related to globalization. The course is augmented by 
extensive travel to engineering and manufacturing company sites in and near 
Nanjing China for discussions with both expatriate and native engineers and 
managers. The second course is a Chinese culture and language course. Students 
with prior Mandarin language skills take Business Chinese and students without 
prior language skills take Introduction to Chinese Culture. These courses are 
taught by Nanjing University faculty. All courses taught in Nanjing 
(globalization and culture) transfer back to the students’ program at BYU. The 
globalization course counts as a senior technical elective in the student’s major, 
while the culture course counts as general university credit.

Global Products in Engineering and Technology (GPET)

A Global Projects in Engineering and Technology (GPET) course has been in 
existence for four years and is a college-wide course. Its purpose is to broaden 
the global learning experience of engineering students by solving real-world 
engineering challenges using multi-disciplinary teams. The program revolves 
around designing and implementing an engineering solution to a critical need in 
an impoverished community. Details of the program have previously been 
published although a few minor changes have occurred since inception. The first 
three programs involved projects implemented in Tonga (2007), Peru (2008), and 
Peru/Ghana (2009) and the current program involves projects in Peru. All of the 
projects completed previously, and the projects currently in development, involve 
technical processes. The program recruits students from all engineering 
disciplines in the college and typically enrolls between 20-30 students. The 3-
credit hour course is a two-semester sequence followed by a two-week 
implementation trip immediately after the second semester.

Global Product Development

This course was first started in 2004 with a typical enrollment of 16. Since 2008 it 
is being offered every other year during the spring term and typically lasts about 
three and one half weeks. Extensive travel is involved. Students are generally 
graduate MBA/ME (PD) students or students having received their BS in ME. 
The course is designed to expose students to a variety of product design and 
manufacturing companies in various countries and their engineering practices and 
policies. Typically the course has taken students to countries in Asia including 
mainland China, Japan and Hong Kong or countries in Europe. Students meet 
with engineering managers in the various companies and compare and contrast 
how they make product design and manufacturing decisions. Cultural sites in 
countries are also visited and students meet with U.S. expatriates to learn what it
is like living and working for a company located overseas.

**Singapore-Fundamentals of International Product Design and Development**

This course was first started in 2009 with a small trial enrollment of six students. The course lasts slightly less than 3 weeks. Currently the course is offered each year for primarily freshman, sophomore or junior students from mechanical engineering, manufacturing engineering technology and industrial design, and others interested in product design. The course is offered jointly with two US universities and the National University of Singapore (NUS, which has about 5,000 engineering students). Students visit companies and design firms in the U.S. and Singapore and also have classroom instruction at NUS from four faculty members: two experts in international product design from NUS, and one each from the two US universities. Students learn the fundamentals and principles of a structured design process in a classroom setting. The highlight of the course for students is working in a cross-cultural team of students from all over the world. The teams design and build a prototype of a consumer product using the facilities and resources available at NUS. Reports are written and presentations given of the chosen consumer product developed.

**Mexico Engineering Study Abroad (MESA)**

The MESA program is a discipline-specific program operated out of the Department of Civil and Environmental Engineering and has as its focus each year the development of a solution to a critical hydrologic problem largely determined by counterpart teams in Mexico. The program has evolved over the past seven years with an average enrollment of 16 students. The program is somewhat of a hybrid project/capstone and service learning program. Many of the projects have evolved into senior design projects for BYU and/or Mexican students and some have formed the basis of research that has been completed and published or is ongoing. It is service learning in the sense that the projects serve the local Mexican constituents as demonstrated by one project where an improved channelization of a river designed by teams of students was constructed for a small municipality. An additional component of service is that technologies developed at BYU have been passed on to Mexican professors and students for further use in their studies. The program is run as a semester long class where the majority of the communication between teams is handled from a distance by email and phone (Skype), with a culminating visit by the BYU students to Mexico to resolve misunderstandings, complete work, and present results to sponsoring agencies.

**China Megastructures/Megacities**

China Megastructures is a 3-credit hour senior/graduate study abroad program held during May-June each year. It is discipline-specific within the Civil & Environmental Engineering Department and its pre-requisites include undergraduate courses in structural analysis and either structural steel design or
reinforced concrete design. The program was first offered in 2008 with 18 students, and again in 2009 with 20 students. A second emphasis in transportation is being added in 2010 titled "China Megacities", with the undergraduate transportation engineering course as a pre-requisite. The program best fits the International Design study with separate courses offered for the structures and transportation emphasis and students can choose to take either one or both. The two courses travel together on the same two-week trip to China visiting some of the largest buildings, dams, and transportation networks in the world.

Individual Internships and Faculty Supervised Group Projects

International internships for both individuals and groups have been carried out in the manufacturing engineering technology (MET) program at BYU since 2004. Individual students have typically been employed for 3-6 months by companies in China, the Philippines, Mexico, and Vietnam. Students are mentored by a manager within the company and are given an assignment to carry out a significant manufacturing-related project during their stay. In addition to individual internships, MET professors have led small groups of 4-5 students on projects which last only one month. The advantage of the one-month group internship is two-fold: 1) students who may not be able to work abroad for 3-6 months can still gain valuable international work experience, and 2) faculty learn about the issues involved in international manufacturing while supervising the students. A total of about 30 students have completed international internships or a supervised group project since 2004. Sponsoring companies include those that produce carbon fiber composites, glass products, custom furniture, printing cartridges, ultrasonic welding machines, and light fixtures. When individual students are sponsored, companies typically pay for airfare and housing, while also providing a small monthly salary. For the group projects the cost of the airfare and housing is borne mainly by the student, because most companies are reluctant to pay for expenses when the project is of short duration.

Assessment

A very important aspect of any study abroad program is the assessment of how the program meets student outcomes and competencies following completion of the course and how the program impacts the future (e.g. recruitment) of the students. Within each study abroad program, student competencies have been identified and assessed to continually strengthen student learning. All programs focus on one or more of the college-wide strategic student outcomes related to global awareness, innovation, leadership, technical excellence, and high character. It is apparent that global awareness is a component of all study abroad programs although the specific competencies related to global awareness vary between programs as a result of the program focus. For instance, the Global Projects in Engineering and Technology (GPET) program has a strong humanitarian focus whereas the Global Product Development program has a greater focus on international industrial processes. Additionally, some programs include a highly innovative component whereas others have a strong focus on leadership. As
expected, the focus of the assessment can vary between programs due to the variability of the course objectives and associated student competencies. However, it is also important that similar assessment occurs across the programs to provide insights among the various programs.

In this work, survey-based assessments are discussed even though, in some cases, more direct assessments have been implemented at the course level. There are three different sets of assessment results discussed in this section. The University’s International Study Program Office assesses all international programs on campus each semester. The first set of assessment results we present are from this set and provide comparison data between all the programs described above. The second set of results is from a survey completed by industrial recruiters of our students and, once again, represents assessment data applicable to all international programs in our college. The third set of assessment results presented are for a specific program – the MESA program-- and provide insight into alumni reactions to international programs a few years after they participated and have been out in industry for some time.

**International Study Program (ISP) Assessment**

An assessment was administered by the International Study Program Office following the completion of each international program. The voluntary assessment sent to all program participants was a survey that included 21 questions, some with multiple parts. Several questions related to the background of the student, whereas other questions were specific to the international experience. Written responses were requested for some questions whereas other questions contained a Likert scale from which to respond. Although the scales ranged from 1-5 for some questions and 1-7 for other questions, all results were adjusted to a scale of 1-5. The following questions were selected for this paper to assess the impact of the international experience on the students.

1. Please rate your overall level of satisfaction with your international experience in comparison to a semester at the BYU campus. A rating of 1 means “not at all satisfied” and a 5 means “completely satisfied”.
2. Now that you have completed your international experience, please rate your preparation class as to how well it increased new knowledge and awareness. A rating of 1 means “no increase” and a 5 means “extreme increase”.
3. Now that you have completed your international experience, please rate your preparation class as to how well it prepared you to be culturally sensitive and to relate to locals. A rating of 1 means “no preparation” and a 5 means “very good preparation”.
4. Comparing the course you have taken during your international semester with other university courses you have taken on campus, please indicate your overall rating for these courses. A rating of 1 means “exceptionally poor” and a 5 means “exceptionally good”.
5. Overall, how do you think your experience will affect your life after you have returned home? A rating of 1 means “long-term negative effects” and a 5 means “long-term positive effects”.
6. Prior to this experience, how much time have you spent living outside your native country?
7. Did you serve a religious mission and was the mission outside of the US?
8. Understanding culture and being able to integrate into new cultural settings is a primary objective of all ISP programs. Looking back on your international experience, what things can you identify as being most significant in affecting your cultural knowledge and competence, and your social integration into a new cultural community?

9. Please comment on how your general attitudes and perspectives on life or the world may have changed over the course of your semester abroad. What led to these changes?

Survey responses from several programs are discussed below. The programs include: 2008 Global Product Development (GPD), 2009 Singapore-Fundamentals of International Product Design and Development (Singapore), 2009 Global Projects in Engineering and Technology (GPET), combined 2008 and 2009 Globalization Asia (Asia), combined 2008 and 2009 China Megastructures/Megacities (China), and combined 2008 and 2009 Mexico Engineering (Mexico). The survey responses for the above programs were 2, 5, 7, 10, 13, and 15, respectively. Although the voluntary survey did not result in a 100% response rate, the results of the survey still provide some important insights.

**ISP Results and Analysis**

Figure 1 shows the assessment data for Questions 1-5. The x-axis of the figure refers to the survey questions noted above. As noted, almost all responses had a score >4. These responses indicated that the students had very good experiences with their preparation course, excellent international experiences, and were greatly impacted in a positive way by the experience. The GPD program showed two low responses for Questions 2 and 3 although the low results may have been affected by the low response rate to the survey. When looking at program responses for each question, there are not any notable trends besides the aforementioned GPD program. Questions 1 and 4 are similar in nature and the results show that the international experience was just as valuable or even more valuable than experiences at the university. Results from Questions 2 and 3 showed that the preparation class was valuable such that it increased the student’s awareness and cultural sensitivity. This is very valuable since cultural sensitivity is very important in the workforce, even if one does not participate in an international assignment. As for Question 5, students felt that the international experience would have a long-term positive effect on their lives.
Figure 1: International Study Program Survey Results

For Questions 6 and 7, the combined responses for all programs showed that 31% spent less than 3 months living abroad whereas 69% spent at least 12 months or more. Since 67% of the respondents stated that they had international missionary experiences, most of the living abroad experiences were a result of these missionary experiences. This high percentage of living in another country prior to participating in an international program is obviously a strength to the programs since students already have some idea of how to interact in different cultures. However, even with the prior international exposure, Figure 1 shows that the students were still greatly impacted by the programs. This demonstrates the importance of these programs in an educational setting.

Responses from various programs for Question 8 included the following.

- Going to a country and seeing the way people live, conversing with locals, and classroom discussions of forces at work within a country all helped me to learn a great deal about Chinese culture. I think doing as the locals did - eating what they eat, traveling as they travel, etc. - also helped me to gain a greater cultural knowledge of China.
- Seeing multiple cultures, interacting in a group with people of other cultures, time in small groups or alone among people in the culture.
- I actually did not feel this course provide enough cultural experience.
We were forced to implement projects that the people wanted, not what we thought was best. We had "book smarts" but working with the native people, we learned a lot about "street smarts", community needs, and adapting projects to what is available.

Similar to the responses noted above, almost all of the responses were positive. Of the positive responses, several noted that the most significant aspect for increasing their cultural knowledge was living and interacting with the people. Very few mentioned that the preparation experiences at the university were the most significant aspect. As is evident from these statements, it is very difficult to be truly instructed in global awareness issues at the university setting without experiencing the culture itself.

Responses from various programs for Question 9 included the following.

- Before this study abroad, I was mainly concerned with news in the US and almost assumed that the world revolved around us. As I went to China I realized how important it is to be aware of the international scene.
- I learned a lot about how different people live and about how different institutions and governments have been set up to facilitate that. Systems different than ours are not wrong, just different. I think I also learned a lot about myself. I often take for granted the conveniences afforded to me but I can see that I've been given much. I've also seen how the most important things in life are those things which are the most basic and simple.
- I learned how small the world is becoming and what an advantage it can be to understand other cultures and peoples.
- Nothing changed!
- I have had many international experiences already [but] I felt like I had the space to become even MORE open to other cultures, as opposed to changing my perspective on a large scale. I always learn more and develop my attitude and personal beliefs as I increase my interaction internationally.
- Globalization is real and happening. The world is getting much smaller.

A majority of the responses involved aspects related to the reality of globalization, the greater appreciation for the life of others, the recognition that people around the world are important, the expanded vision to help people around the world, and the importance of understanding others. There were only two or three responses that stated that their attitudes and perspectives on life were not greatly changed. It is difficult to know whether this is because they already had an international experience. However, it is evident that most students were greatly impacted by their international experience.

**Recruiter Survey**

Much of the motivation for developing competencies in engineering students to practice engineering in a "global engineering world" is based on what we see companies doing in their global expansion. In addition, as noted in the introduction section of this paper, many have written about the need for preparing our students to be "competent globally". But what of the companies that actually hire our graduates? What do they feel about "globalization" and what...
value do their recruiters place on students who have been involved in learning activities to increase their global competence in engineering?

A survey of recruiters from approximately 39 companies was administered during the fall semester of 2009 at an on-campus college recruiting fair. The survey was intended to give recruiters an opportunity to comment on their opinions concerning the effects of globalization on their current recruiting policies and practices. The questionnaire is shown below:

College of Engineering & Technology International Experiences Employer Survey

One of the college’s strategic initiatives has been to provide more opportunities for students to receive international educational activities, including study abroad and internships. We would appreciate receiving your perspective on the value your company places on these experiences.

<table>
<thead>
<tr>
<th>Rating scale:</th>
<th>1- strongly disagree; 2- disagree; 3- neutral; 4- agree; 5- strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>My company has opportunities for employees outside of the United States, or with foreign partners or suppliers?</td>
</tr>
<tr>
<td>2.</td>
<td>International experience will become even more important for my company in the future.</td>
</tr>
<tr>
<td>3.</td>
<td>My company would be more likely to hire a student who had a study abroad or international internship experience.</td>
</tr>
<tr>
<td>4.</td>
<td>When it comes to hiring, my company sees no additional value in a study abroad or international internships, compared to classroom training on international issues.</td>
</tr>
<tr>
<td>5.</td>
<td>My company has greatly benefited from hiring employees that participated in an international experience.</td>
</tr>
<tr>
<td>6.</td>
<td>International experiences enhance a prospective employee’s abilities in…</td>
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<tr>
<td></td>
<td>Leadership.</td>
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<td></td>
<td>Teamwork.</td>
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<td>Character Development.</td>
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<td>Technical Competence.</td>
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<td>Motivation/Career Goals.</td>
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<td>Other:</td>
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</table>

My company hires in the following area(s):

- [ ] Chemical Engineering
- [ ] Civil and Environmental Engineering
- [ ] Construction Management
- [ ] Electrical and Computer Engineering
- [ ] Other: □

- [ ] Industrial Design
- [ ] Information Technology
- [ ] Manufacturing
- [ ] Mechanical Engineering
Would you be willing to suggest and provide contact information of someone in your company who would be interested in providing us further information now and in the future with respect to your company’s interests in hiring students who have international educational experiences?

Any additional comments:

Discussion of Survey results

Figure 2 shows a graphical summary of the responses to the survey. The numbers noted below the horizontal axis refer to the questions noted in the survey in which employers were asked to rank each statements from 1 to 5 (1 strongly disagree, 5 strongly agree).

![Figure 2: Recruiter Survey Results](image)

With regards to global career opportunities (Statement number 1), it is interesting to note that over 75% of the respondents strongly disagreed or disagreed that there were opportunities for employment outside of the United States with their company. This high response may have affected some of the results of their response to the additional statements since such companies would likely not rely on international experience for recruitment or the evaluation of job performance. Similarly, 51% stated that they did not feel that international experience is important for the future of their company (#2). Only 13% agreed or strongly agreed that their company would more likely hire a student with international experience (#3). Interestingly, 46% stated that classroom training on international issues is not as valuable as actually participating in...
an international experience (#4). As for a company benefiting from hiring students with international experience (#5), 34% strongly agreed or agreed as compared to 33% that disagreed or strongly disagreed. These results show great parity in the need and benefit of students having an international experience.

As for how an international experience is perceived to enhance an employee’s ability (#6) in given traits, greater than 63% agreed or strongly agreed that the two greatest traits benefitting from an international experience are global awareness and character development. While global awareness was expected, character development was an attribute rated far above leadership, teamwork, innovation, and technical competence. The third greatest trait was identified as leadership (37% agreed or strongly agreed). It is unclear as to why character development and leadership traits appear to a recruiter to be enhanced through an international experience. Nevertheless, very few companies (from those surveyed) would be more likely to hire a student with international experience.

These results are both interesting and challenging. Our feeling after receiving these survey results is that additional research needs to be completed by surveying decision makers in companies that hire our students in addition to recruiters before firm conclusions can be drawn. In addition, the recession may be having a marked effect on the recruiter’s responses versus the responses that may have been given before the current recession.

Alumni Survey

Anecdotal evidence provided by faculty directors immediately after a study abroad programs indicates very high student satisfaction rates. Student assessments can be biased by a “feel-good” attitude that seems to be commonly associated with taking an international trip. For this reason a follow-up survey to alumni of the MESA program was administered to determine if after graduation and a few years of experience their perceptions about the program, and the outcomes developed were similar. The survey asked alumni to rate their development in the core class objectives of leadership, technical competence, teamwork skills, cultural/global awareness, and technical Spanish language skills. It further asked them to rate whether the MESA program had:

1. Helped prepare them better for the job market.
2. Given them an advantage in the job market over others who had not participated in international study abroad experiences.
3. If they still applied skills learned from their international study experience.

The MESA alumni survey was sent to 40 former MESA participants in order to assess their perceptions of the MESA program one to four years later and after spending some time in the job market. These individuals participated in MESA in any year from 2005 to 2008 and of those, 22 (55%) responded. The respondents were asked how much they agreed or disagreed with MESA helping them develop key engineering attributes of leadership, technical competence, teamwork and global awareness. The results are shown in Figure 3. It is helpful to visualize each individual response to observe the spread of the data. As can be observed in the graph, the majority of the respondents either agreed or strongly agreed, except in the development of Spanish skills, where we have a significant amount disagreeing or feeling neutral about it. This
can likely be attributed to the fact that roughly half of the students in the program are fluent in Spanish while the other half are not. The program does not focus on learning Spanish and so only those who are already fluent in Spanish are likely to feel their skills have been enhanced by the program.

![Figure 3: Alumni Perception on Development of Five Key Engineering Attributes](image)

The respondents were also asked their perceptions on how MESA prepared them for the job market and the results are shown in Figure 4.

![Figure 4: Alumni Perception on Preparation for Job Market](image)

Fifteen of the twenty-two respondents either agreed or strongly agreed that MESA helped them be better prepared for the job market. When asked whether MESA gave them advantage in the job market over others without a study abroad experience, there was a greater spread in the data. One respondent disagreed and eleven were either neutral or somewhat agreeing. It might be
difficult to determine the truthfulness of this statement. An employee may not always know during an interview process whether he/she was selected or others were not because of a study abroad experience. In addition, they may or may not find out about it after they are hired. Nevertheless, this is a very important aspect of long term assessment of the program. Nine of the respondents somewhat agreed when asked if they still apply principles/skills learned or developed in MESA. Eleven respondents either agreed or strongly agreed.

**Conclusions and Future Work**

The College of Engineering and Technology at BYU is nearing the end of its first five years in conducting a set of international programs to help promote global competence among our students. These range from individual courses with internationally-oriented projects to service learning programs to full-term foreign living experiences. All programs have a globalization content as well as other areas of focus (interdisciplinary teamwork, service, cultural understanding, discipline-specific technical focus etc.). This paper presents and discusses the first set of assessment data for these programs based on surveys administered by the University’s International Study Program Office, by the college, and by individual programs. The assessment data confirms our previously-held sense that students almost uniformly view their international experiences as positive in terms of giving them a much broader view of the world in which they intend to pursue their technical careers. Of interest, the question regarding long-term positive effects on their lives elicited the highest score of any question. Also of interest, when asked open-ended questions about what they valued from their international experience, the students strongly tended to focus on better understanding of other cultures and the world rather than on the development of new discipline-specific technical skills. Our first experience with a recruiter survey this past fall provided surprising results. Although the majority of respondents indicated that there were few international opportunities within their particular companies, only 25% agreed that there was no additional value in study abroad experiences compared to classroom study of international issues. Additionally, 63% agreed that the two greatest traits benefitting from an international experience are global awareness and character development. Finally, the alumni survey for the MESA program indicates that student attitudes regarding the value of their international experience seem to be as positive a number of years after the experience as immediately following.

As the title of this paper suggests, these results represent a preliminary report. As we continue with the operation of our international programs, we intend to continue to assess our programs, adjusting and modifying the assessment instruments as needed. Specifically, based on these preliminary results, we intend on adding additional questions to the university assessment process and, as noted in the body of the paper, we also intend on measuring industry’s views on international programs by also surveying managers in addition to on-campus recruiters. As our assessment sample size continues to grow, we hope to be able to draw additional information from it that will help us understand the relative value of the various programs we operate and be able to continually improve them. We intend to report the results of our ongoing activities in the future.

**References**