THE ADJUSTMENT EXPERIENCE OF FIRST-YEAR INTERNATIONAL UNDERGRADUATE STUDENTS IN ENGINEERING

by
Whitney Barnes

ECE 497, Senior Research Project
ECE 499, Senior Thesis

Department of Electrical and Computer Engineering
University of Illinois at Urbana-Champaign

December 17, 2010

ABSTRACT

International students are valuable to domestic universities as they inspire intercultural learning, foster understanding of diversity and global issues, and contribute financially to the US economy. Although international students benefit universities, they encounter adjustment difficulties that differ from those of domestic students, such as language barriers, cultural differences, and academic adjustments. Little research exists on this subject; therefore, the challenges of international students are often overlooked by universities. Through qualitative and quantitative analysis, this study identifies the challenges that engineering international students experience. A survey and group interviews were conducted with first-year engineering students to identify the adjustment factors. While the domestic and international students identified similar adjustment issues, international students had more difficulty with making American friends, understanding cultural references, adapting to American food, and getting acquainted with unfamiliar teaching methods and assignments. This study will increase awareness about the adjustment factors that international students face so that universities will better help them succeed.

TABLE OF CONTENTS

PAGE

-

1. Introduction

In Mexico, Aarón Martinez was seen as the brightest student in his high school, city, and, of course, his parents' eyes. He was one of the first in his area to be accepted to a top university in the United States to study engineering. However, when Aarón started his courses, suddenly he had to adjust to a new environment where being the brightest student was not so easy anymore. He struggled to learn difficult math material, and to read texts in English in history and humanities courses. He survived first semester, but second semester was a different challenge.

When courses in his second semester became harder, Aarón had no one on campus who really supported him. Aarón knew other students in his classes and dormitory, but he never made a strong connection with a group of friends. Very few students from his home country attended the same university, and he never could relate with the Mexican-American students. He tried communicating with other domestic and international students, but his thick Mexican accent made him feel insecure.

Eventually, he fell so far behind in assignments that he became depressed and stopped going to his classes. Soon, he failed all of his courses and returned to Mexico. His parents were extremely concerned about the son they were so proud of, who suddenly failed out of college. He came to the conclusion that college just wasn't for him; however, his parents would not let him give up. His parents forced him to reapply, and in the fall, he returned to school with a new attitude. He wanted to show everyone that he deserved the title of being the brightest student.

He studied harder, made a group of study friends, and graduated two and a half years later. He never received a grade lower than an A-minus. Now a graduate student, Aarón is pursuing a PhD degree in engineering, as he wants to be a professor and inventor. Aarón thanks his parents for their encouragement to try again. Reflecting on his own experience, he knows that he almost did not complete college because he never got the support that he needed. Now Aarón is a mentor to Hispanic undergraduate students. He does not want students to struggle like he did because they were never able to fully adjust.

Cases like Aarón's are not so uncommon among university students. Many students struggle through their first semesters, but those who work hard and persist usually earn an undergraduate degree. Aarón simply needed encouragement and adjustment time to succeed. International students, like Aarón, are usually unfamiliar with the American lifestyle and academic expectations in American universities. If they do not receive the support that they need, they might become depressed, earn lower grades, and in a worst case, drop out of school. Because Aarón's parents cannot support all international students, universities should play a supporting role for all international students to prevent each from struggling with adjusting.

Many past researchers suggest that Aarón was not alone in his struggles. Compared to domestic students, international students have a more difficult adjustment experience with living comfortably and studying effectively. However, domestic and international students should have equal opportunities in college. International students that have a more difficult adjustment experience may initially have a less positive experience than domestic students. The research conducted in this thesis finds that both international and domestic students have adjustment difficulties, but international students have more difficulty with language barriers,

cultural differences, and academic expectations. The adjustment factors can be overcome when international students are given help and time to adjust to their first semester at a US university.

2. Literature Review

2.1 Importance of International Students

Within the past 50 years, the enrollment of international students in US universities has increased steadily, despite some minor fluctuations (as seen in Fig 2.1) [13].

B. INTERNATIONAL STUDENT TRENDS

In 2009/10, the number of international students in the U.S. increased 2.9% over the previous year to 690,923 students.

Year	Total Int'l Students	% Change	Total U.S. Higher Education Enrollment*	% Int'l
2000/01	547,867	6.4	15,312,000	3.6
2001/02	582,996	6.4	15,928,000	3.7
2002/03	586,323	0.6	16,612,000	3.5
2003/04	572,509	-2.4	16,911,000	3.4
2004/05	565,039	-1.3	17,272,000	3.3
2005/06	564,766	-0.05	17,487,000	3.2
2006/07	582,984	3.2	17,759,000	3.3
2007/08	623,805	7.0	18,248,000	3.4
2008/09	671,616	7.7	19,103,000	3.5
2009/10	690,923	2.9	19,562,000	3.5

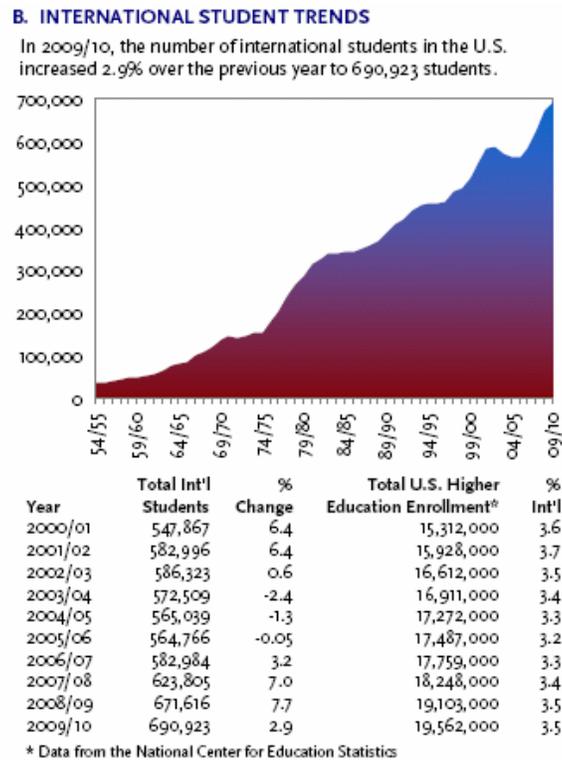* Data from the National Center for Education Statistics

Fig 2.1 International Student Trends

The Institutive of International Education Open Doors [13] data shows that the United States hosts more international students than any other country in the world. In the 2009-2010 school year, international students represented 3.6% (exactly 690,923 students) of

students in the US higher education population. Of the number of international students studying in the US, 18.4% of the students are engineering students (127,441 students).

While students come from all parts of the world, most come from Asian countries, such as China, India, and South Korea (Table 2.1) [13].

TABLE 2.1   TOP PLACES OF ORGIN

C. TOP PLACES OF ORIGIN of International Students, 2008/09 & 2009/10.

• Students from the top five places comprise 52% of all international students.

Rank	Place of Origin	2008/09	2009/10	% of Total	% Change
	WORLD TOTAL	671,616	690,923	100.0	2.9
1	China	98,235	127,628	18.5	29.9
2	India	103,260	104,897	15.2	1.6
3	South Korea	75,065	72,153	10.4	-3.9
4	Canada	29,697	28,145	4.1	-5.2
5	Taiwan	28,065	26,685	3.9	-4.9
6	Japan	29,264	24,842	3.6	-15.1
7	Saudi Arabia	12,661	15,810	2.3	24.9
8	Mexico	14,850	13,450	1.9	-9.4
9	Vietnam	12,823	13,112	1.9	2.3
10	Turkey	12,148	12,397	1.8	2.0
11	Nepal	11,581	11,233	1.6	-3.0
12	Germany	9,679	9,548	1.4	-1.4
13	United Kingdom	8,701	8,861	1.3	1.8
14	Brazil	8,767	8,786	1.3	0.2
15	Thailand	8,736	8,531	1.2	-2.3
16	Hong Kong	8,329	8,034	1.2	-3.5
17	France	7,421	7,716	1.1	4.0
18	Indonesia	7,509	6,943	1.0	-7.5
19	Colombia	7,013	6,920	1.0	-1.3
20	Nigeria	6,256	6,568	1.0	5.0
21	Malaysia	5,942	6,190	0.9	4.2
22	Kenya	5,877	5,384	0.8	-8.4
23	Pakistan	5,298	5,222	0.8	-1.4
24	Venezuela	4,678	4,958	0.7	6.0
25	Russia	4,908	4,827	0.7	-1.7

As the number of international students increases, their impact on the US economy also grows. About 70% of international students pay full tuition [10]. Overall, international students contributed approximately $12 billion to the US economy in 2005 [9].

In addition to the economic contributions, international students provide benefits to their universities that money cannot purchase. International students inspire intercultural learning and increased understanding of diversity and global issues. Interest in global issues creates future international business, political allies, foreign policy makers, and trade connections [1].

2.2 Adjustment

In spite of their contributions, their challenging adjustment to American universities is often overlooked. International students face adjustments with academic expectations, language barriers, cultural differences, and discrimination.

When international students first come to the US, they must learn how to adjust to a different classroom environment. For example, in Korea and Japan, the higher education classroom atmosphere is more competitive because students compete for a limited number of high salary jobs. Students are reluctant to help each other because they fear that others will prevent them from succeeding. On the contrary, in America, the atmosphere is more cooperative, and students focus more on what interests them, rather than competing to get a better job [5].

Language barriers also hinder international students' adjustment. They struggle to understand lectures and instructors who speak quickly and use advanced vocabulary [1]. According to Jacob [12], international students hesitate to participate in class discussions since they have difficulty understanding classroom lectures.

Lee [4] argues that international students have to negotiate two different cultures based on the level of their language proficiency. She implies that it is difficult to learn

English while maintaining one's home culture because culture and language are intertwined: the more international students learn English, the more they must adapt to American culture and abandon their own culture [4]. Contrary to Lee's speculation, very little research actually exists that supports the idea that as students learn English, they are less able to maintain their native cultures.

In general, culture could be considered the main factor in the adjustment to the United States. Region of origin affects cultural adjustment, and concerns vary from country to country. A study mentioned by Jacobs [12] indicates that African, Asian, and South American students prefer the practices of their own country, whereas European international students have an easier time embracing bicultural values. Klomegah [9] suggests that students from a similar cultural region adapt more quickly to the US than students from dissimilar regions. Therefore, European students adjust more easily to the US than non-European students because of cultural similarities [9]. Regardless of which country a student comes from, Jacob [12] states students from the same continent may adjust differently. For example, students from Japan and India have different concerns even though they are both considered "Asian." It is important to remember that within-group differences do exist [12].

As discussed before, each student's cultural values usually determine how well the student adapts to another culture. According to Constantine [7], African students often conflict with US students because of their cultural perspectives. African students practice interpersonal relationships such as group survival, communalism, harmony, cooperation, etc., while domestic students tend to be individualistic and self-reliant. Since the African students have such a high dependence on a communal culture, they are challenged by their absence from family and suddenly have to rely on themselves. African international students are less

likely to utilize services such as professional counseling. They choose not to utilize these opportunities because of cultural beliefs about the treatment of mental health problems, commitment to their family values, or lack of familiarity with the services [7].

In colleges and universities, student services programs for international students include counseling, networking, host families, and social events to help students become familiar with aspects of US culture. However, Klomegah [9] found that many international students feel that college officials do not interact enough with them in these programs; therefore, the international students rely on other internationals instead. Students who choose to interact with other students from the same geographical area are able to have a sense of belonging that they sometimes cannot find in the designed programs. The internationals feel comfortable with others similar to them, but unfortunately, the domestic students do not develop strong relationships with the international students because of the lack of interaction [9].

While some groups from the same geographical area depend on each other for assistance, others have fewer members from the same area and therefore have fewer internationals to rely on. In many US universities, there are many international students from Asia, but few from Latin America [4].   According to the enrollment statistics cited previously [13], the smaller groups have a disadvantage for same area support. In particular, African international students are disadvantaged because they only comprise a very small percentage of the international student population in the US.

In one particular case study [3], a group of Saudi Arabian international students at Portland State University did not have much transition support from the university, so they did not integrate themselves with the other students. Instead they set up their own small community

and supported each other, rather than trying to adapt to American culture. Because of the established community, new Saudi Arabian students adjusted more easily in each subsequent year [3]. Although students eventually succeeded, the lack of transition support from the university made it much more challenging for international students compared with already established domestic students.

Among cultural differences, many international students are unaware of discrimination and racism in the US. Constantine [7] conducted a focus group where African students explained that they were unprepared for the negative prejudices that they experienced at their university. African students grow up in a homogeneous community, so when coming to the United States, they have to adjust to discrimination and racism that they had not previously experienced. Some of the students felt that the other students judged the Africans as not being as smart or civilized. One student even said she experienced this same attitude from other international students. The student's international roommates asked her to move out based on strong stereotypes that existed in the community.

The African students who discussed discrimination and racism said that although the racial tension was hard to accept, they would not give up studying abroad. They just tried their best to continue with their studying by occupying their mind with other activities or simply sleeping it off [7]. While each international student's exposure to discrimination and racism may vary from none to a lot, the hostile attitudes of other students can still affect the adjustment by international students.

2.3 Problem

Typical young adults encounter academic stresses regardless of their origin [12]. However, international students have more difficulty than domestic students finding support to overcome their academic obstacles; thus, researching about international students and their adjustment is a more urgent issue.

Parents often push their children to study abroad, and US universities vigorously advertise to pull them in. Although universities dedicate substantial efforts to attract the international students, they dedicate little effort to take care of these students once they arrive [4]. While the US hosts the largest number of international students studying abroad, their leading status is not guaranteed in the future [13]. The status of the US as a world leader may change in the coming years, especially if current international students leave the country still feeling uncomfortable with the culture or unsatisfied with their university experience. The number of international students studying in the US may actually decrease, since prospective international students usually base their decisions on the experience of previous students whom they know.

As observed by Reynolds [11] and Constantine [7], when students lack support, their excitement and enthusiasm about academic life and career goals quickly evolve into sadness and disappointment. Students have pre-conceived notions about the US, but once they arrive and see something different from their expectations, they have mixed feelings and confusion about how to adjust. International students are a resilient group, but the difficult cultural adjustments can cause psychological distress, physiological complaints, and mental health problems such as depression or anxiety [11].

Klomegah [9] hypothesized that international students do not integrate well into society because the host country intentionally alienates them. International students can feel alienated or isolated entering into a society where White middle class values are the norm, values that may differ from those the students are used to in their home countries [8]. However, previous research has mostly focused on the issue that international students do not integrate into society as much as possible because of the lack of support, not alienation from the host country. Perhaps Klomegah's 2006 article focused too much on past research that has lost some of its relevancy in current times. Unlike other articles, Klomegah focused on different factors of adjustment; however, older research may not be relevant to the adjustment of international students today.

Many international students choose to come to the US because of the career opportunities, but after acculturative distress, they may be discouraged from pursuing their career goals. Poor adjustment to university life negatively affects the career development of the international students. Students who do not adjust well will be less confident that they will be able to achieve their career goals. In addition, some international students feel unsure about which skills or abilities are even needed for their intended careers. The uncertainty frequently arises from cultural adjustment concerns or lack of knowledge about vocations and career planning in the US [11]. The failure of cultural adjustment relates a student's ability to pursue their career goals and aspirations.

Biases by faculty and staff also cause some setbacks for the international students. Many college counselors practice a theory based on a universal normal behavior that favors individualism, rather than collectivism. Biased counselors favoring individualism behavior naturally conflict with international students who cannot always relate to individualism based

on their own culture characteristics. An unbiased counselor is one that is culturally competent, aware of their own cultural values, and willing to gain knowledge about the student's culture [10].

Professors also misunderstand the students' behaviors or needs. For example, similarly to counselors, a professor might reject an international student's form of writing because it is expressed differently from academic norms in the US. Some professors assume that students do not participate because they already understand the material, when in reality, the students may not be able to keep up with the pace of the lecture [1].

Language difficulties, cultural differences, and academic concerns cause problems for the students, but if faculty and staff can understand these factors, they can become more effective [6]. Faculty and staff should become more culturally aware and prepared to help international students. All students have their own personal difficulties when coming to a university for the first time, but fully prepared faculty and staff can provide the necessary support to the international students to adjust to the US.

2.4 Solution

According to a focus group of international students conducted by Olivas [10], their strategies for positive adjustment included those shown in Table 2.4 [10]:

TABLE 2.4   8 STRATEGIES FOR A POSITIVE ADJUSTMENT

Knowing themselves and others	Expanding their worldview	Developing cultural and social contacts	Gaining English proficiency
Building relationships	Asking for help	Establishing relationships with advisors and instructors	Letting go of problems

Students, faculty, and staff who understand the strategies for positive adjustment will know how to help others who are adjusting [10].

In order to build cross-cultural friendships, communication is key. Host students know that international students have some language barriers, yet can be insensitive to their conversation needs. International students will not improve their English if host students do not take the time to communicate with them. In the past, international students have indicated that some of their stress level was reduced when they were able to make friends with host students, who helped them adapt to the cultural differences [10]. Bilingual students as peer helpers operate as great mediators between the international students and host students. Hayes [6] recommends skill workshops, such as team building, that put international students and American students together, allowing more opportunities for communication. At such workshops, international students have the chance to communicate and network with host students, and the host students become more sensitive to students from other cultures [6]. Programs such as team building workshops seem like a simple solution that benefits both groups involved.

Programs should also be dedicated to educating the faculty, staff, and campus community about diversity in order to help international students cope with adjustments such as discrimination, homesickness, and the transition to undergraduate life. Efforts by the university should show international students that the university cares about their well-being

and tries to minimize their discomforts. Poyrazli [8] indicates that universities that have a strong dedication to diversifying the campus and spending more money on student aid and services have a lower level of racial tension. For the advancement of international students, universities must educate faculty, staff, and campus community on how to cope with the hardships that students face.

Out of the eight strategies mentioned by Olivas [10], establishing a relationship with advisers and instructors is crucial, but often neglected. International students' academic support is linked to a developed social network. Professional counselors help international students who feel a loss of social support. Since each student is different, counselors should identify what areas are strong and weak and how to develop the weak areas, such as shyness, low self-esteem, and pessimism [6]. Unlike other scholars who collectively grouped all international students, Hayes and Lin declare that although international students generally might face the same difficulties, each student is an individual and overcomes each difficulty differently. Whether a student is domestic or international, counselors must pay special attention to individual students and their unique reactions to their challenges.

Agreeing with the need to analyze individual needs, Jacob [12] proposes that the initial step by a university should be the assessment of the unique needs of international students at their specific institution. Institutional characteristics such as size and location can affect the needs of the students. While making their assessments, qualitative methods, such as focus groups, provide clearer identification of needs for the international students as compared to quantitative methods, such as surveys [12].

International students need extra assistance in work experience, job-search skills, and career planning, but international students less frequently utilize the available services

regarding these areas. Instead of waiting for international students to seek advice, programs should immediately and proactively target international students as soon as possible. Student leaders and community members should help the counselors reach out to the international student population, especially those leaders and members who work with international communities and represent diverse cultural backgrounds. Most important, all services directed toward international students should provide proactive, visible, and accessible services [11]. Olivas [10] further suggests that students who have positively adjusted are obligated to help other students in need.

Although the cost may be high to implement integration and outreach programs, these programs should be seen as an investment rather than an expense because the programs benefit the university greatly when international students are fully satisfied with their college experience.

3. Research Method

In this project, I gathered quantitative data from a survey and qualitative data from focus group interviews of first-year engineering students at the University of Illinois at Urbana-Champaign in the fall of 2010. In order to administer the survey and conduct the focus groups, I completed the following training modules online:

1. UIUC Human Subjects Training module

2. CITI Training Module at the Collaborative Institutional Training Initiative (CITI)

    - Internet Research - SBR, Basic Course

    - Required UIUC Training Modules, Basic Course

This project received approval from the Institutional Review Board as IRB#11047.

All 1,676 first-year students in engineering were invited by e-mail to participate in an online survey and in focus group interviews. Only students 18 years or older were eligible to participate. The recruitment e-mail messages explained that the purpose of the research is to investigate the differences in the adjustments of domestic and international first-year engineering students to studying and living at the university. The recruitment messages are included in Appendix 1.

3.1 Survey

For the online survey, the students had 5 days to complete it, and an additional e-mail was sent on the last day of the survey as a reminder to complete the survey. The estimated

survey completion time was about 20 minutes. Students were informed about confidentiality in the recruitment e-mail message.

In the first question of the survey, students chose to allow their responses to be used for research purposes. If a student changed their mind during the survey, they could stop the survey without having their data stored. No questions were mandatory to answer for the completion of the survey. Students were not required to enter any personal information, such as school ID or name, to guarantee that their responses would remain anonymous. The survey contained 39 multiple choice questions and 2 open-ended questions. The survey questions are in Appendix 2.

By the end of the survey period, 422 students responded. Two students did not consent for their responses to be used, so their data will not be counted. The number of participants were divided into the following categories shown in Table 3.1:

TABLE 3.1   SURVEY PARTICIPANTS

Domestic Students	312
International Students	99
International Buddies Students	9
Total	420

Mann Whitney-U test and the T-Test were used to determine whether any significant difference existed between the groups of domestic and international students.

3.2 Focus Groups

Separate recruitment e-mail messages were sent to the domestic students, the international students, and the international students in the International Buddies in Engineering Program. In the International Buddies in Engineering Program, first-year international students are paired with domestic students who act as mentors or buddies. Students were informed that only 8 students would be selected for each focus group. The focus group was estimated to last about 90 minutes. Students were informed about compensation and confidentiality in the recruitment message.

Eighty-three students volunteered to participate in the focus group sessions. For each group, 8 to 10 participants were chosen. The participants were selected based on their gender and country of origin in order to generate diversity.

The focus group sessions were held from 5:00 to 6:30 pm on September 28, September 29, and September 30, 2010 in a conference room on campus. Focus group participants signed a consent form that stated the focus group procedure, voluntariness, compensation, benefits and risks, and confidentiality. All participants signed the consent form, and the records have been privately stored. A copy of the consent form is included in Appendix 3. In return for their participation, focus group participants received $10 for their participation and free pizza and soda.

At the beginning of each session, each student was given a code name to use for confidentiality. While one main researcher asked questions to the students, an assistant researcher occasionally asked follow-up questions based on the students' responses. The

focus group questions are in Appendix 4. The sessions were recorded with a voice recorder and were later transcribed verbatim.

During the focus group session, if students wanted to discontinue their participation, they were able to leave at any time and receive pay based on the amount of time that they participated. Students were able to skip any questions that they preferred not to answer. All students participated for the entire session.

Although 8 to 10 students were chosen for each focus group session, only 7 participants attended the first session (domestic students), 4 attended the second session (international students), and 7 attended the third session (international students in the International Buddies in Engineering program). The focus group participants were divided into the following categories as shown in Table 3.2:

TABLE 3.2   FOCUS GROUP PARTICIPANTS

Participants	Men	Women	In-State	Out-of-State	Europe	Latin America	Southeast Asia	South Asia	East Asia	Middle East	Caribbean
Domestic	3	4	6	1	0	0	0	0	0	0	0
International	4	0	0	0	0	1	1	1	1	0	0
International Buddy in Engineering	3	4	0	0	1	0	0	1	3	1	1

A standard basic qualitative method [14] was used to analyze the focus group data.

4. Focus Group Results

The focus group transcripts were analyzed using qualitative data analysis (Merriam, 2008). Each researcher first read through the transcripts marking important quotes and ideas that were expressed by students. The researchers then shared their notes together and grouped their findings into themes. Significant themes express concerns raised by two or more students.

4.1 Communication

Past literature focuses on the language barriers that international students must overcome in domestic universities. Andrade [1] and Lee [4] emphasize that international students often do not speak English fluently; therefore, they cannot communicate easily with other native speakers. However, the international focus group participants stated that they struggle less with their fluency in spoken English and more with understanding accents, American slang, cultural references, and different terminology. These particular barriers hinder conversation with the domestic students and communication with instructors and teaching assistants.

4.1.1 Accent

In the classroom, students have some adjustments with understanding professors' or teaching assistants' accents from other countries. With the challenge of keeping up in a fast paced lecture, an accent can cause even more difficulties because the students must adapt to

the instructor's accent. In the focus group sessions, one international and five domestic students said that they had to adjust to an instructor's accent.

> *I have a professor whose accent is very difficult to understand. So I do a lot of extra studying in that class and I would say generally the classes are pretty fast.* -female, US

Though both domestic and international students must adjust to the different English accents, with time, domestic students were able to adjust more quickly. The language barrier seems to only be a temporary adjustment for them.

> *Like all my TAs are foreign. Well, they have a foreign accent. So it's like, when you first go into a class it's hard to understand but the more you get there, you will understand it more.* -female, US

International students have a hard time understanding TA's accents as well, but they have an added communication barrier because both the TA's and internationals cannot understand each other well because their different accents.

> *If you take the TAs and stuff. The same thing happens if they are from another part of the world. Yeah, so sometimes you can't get your ideas across, through because maybe, you don't have good command of the language or you have a kind of accent slightly. You have to really keep repeating yourself, which can kind of be a bit annoying.* -male, South Asia

Although the international students may be fluent in English, their accents can still act as a barrier with understanding other internationals' accents. However, people are generally willing to try to understand each other.

> *Sometimes communicating can be a bit difficult, because you have like, so many people from so many parts of the world. So, they might be actually speaking English, but they might have some kind of accent. So that happens to me too because I might not sometimes speak clear for the other person. Generally I'm like that. So, sometimes that value exists.*
> *Otherwise, it's generally positive. People are really friendly...Even if that value exists people are very patient with you. It will like, you know, no not good impressions. So, in that sense, it's very nice."* -male, South Asia

4.1.2 Cultural References

International students from countries dissimilar to the US are unfamiliar with certain topics that may be interesting to Americans. Without knowledge about why a topic is interesting to an American, international students find it arduous to join a conversation about an unknown subject.

I think, I just found it a little bit hard to make American friends. Because they have their same talkings and cultures and they become excited when they talk about some soap opera. But I know a little about that. I can't know why they are laughing or why they feel excited when they talk about some people or something. -female, East Asia

If I take it a bit further, a little aside from study groups and focus on people, let's say, you have a group of Americans and you want to join in. You want to join in. It can be a bit difficult because the topics they talk about aren't familiar to you...Like, what's really going on here? Like, you can't actually contribute to the conversation because it might, like most of the time it was stuff that you don't know, a lot of terms you don't know. So, it can be difficult. Yeah, it can be like difficult to contribute and like go with the flow with everything...It would take a lot of effort on your part to you know, get familiar with the terms. Like for instance, 'nerf wars'. I had no idea about 'nerf wars.' So, things like that. People here, they know from like their childhood what these stuff are but you don't know these stuff. So, some conversations can be pretty one-sided. -male, South Asia

It seems as though sometimes domestic students forget that international students are not on the same English proficiency level as them. They will speak quickly and use slang without taking into consideration that the international student may not understand their conversation. International students quickly feel left out of the conversation.

The most difficult problem that I face is to chatting with American people...I find that they just talk really fast and a lot of American slang. I can't already know what they are talking about. Yeah, I can't get like all of their conversations. It's real bad. -male, East Asia

In the classroom as well, some unfamiliar subjects are difficult for international students to understand. For example, domestic students take American history in high school. International students do not have the same experience and therefore do not always comprehend references to American history.

Maybe, some courses are easy for Americans or natives, but it's really hard for us. Like, the western history...it's quite hard for the internationals because we really spend a lot of time on the readings of books and textbooks and extra stuff like that. Maybe the general of us can't understand what we've did so far. -female, East Asia

4.1.3 Terminology Difference

International students must overcome a communication difference with their instructors relating to the use of academic terminology. Although it may seem minor, when an instructor uses different terms than the international students, the students must adapt to a new way of saying something that they have said throughout their education.

> *We say, 3 by 5 or something for fractions. And they say 3 over 5 and they don't get it when you say 3 by 5 or something, but it's like small things. I found that annoying when I first came. I'm trying to get used to the other way of saying it.* -female, Middle East

Students are also unfamiliar with kinds of assignments and projects that are common in the US. Instructors often take common practices in the US for granted and do not explain what they expect from their students. International students who are not familiar with standard assignments have to give an extra effort to interpret what the instructors expect.

> *Sometimes there is like, barrier of language. But it's usually a very positive experience. Especially from like, for example, my background, because in Italy usually in high school, we don't have any projects or study group. It's a very, I guess, it's more helpful and also interesting to get to know other people. Like how do they face different problems or assignments or whatever.* -female, Europe

4.2 Interpersonal Relationships

4.2.1 Friends

When students have difficulty with concepts or homework, they ask a tutor or teaching assistant at office hours, use online lecture notes, or search for their questions online. More than anything else, students ask their friends for help. Asking their friends for help is more convenient because friends are available more often and are easier to relate with.

> *My first step if I did have friends in those classes would be to go those friends and be like,*

"Hey, can you explain this to me?" cause that's a little more familiar and easier. But if I don't have friends in the classes that I've known previously or met, then I usually go to the TAs. Otherwise, I do use the online lecture notes, especially for my physics class. [The notes are] like just the professor's PowerPoint and sometimes it's helpful to look at those. -female, US

Many domestic students may have the advantage of having a group of friends from high school at their same college. They can come to college feeling more comfortable with a group of people whom they already know. Because they already have friends, they do not have to stress as much about making friends at the beginning of the year.

I know people from high school who were in the engineering program and they're taking the same classes as me. So it's kinda like a built-in study group right there. -female, US

Although domestic students may have the comfort of having friends and high school classmates coming to the same university, international students do not always have the same advantages of having an immediate friend base. In fact, a disadvantage for some international students is integrating into pre-formed groups of domestic students.

Maybe just like knowing a lot of new people, and then especially my dorm, actually everybody comes from Chicago or suburb of Chicago. So, it's kinda hard to adapt with them, but actually it gets better and better. -male, Southeast Asia

With less than perfect English, the internationals might be intimidated to speak to the groups of domestic students. Although international students might initially feel intimidated, domestic students are usually friendly and accepting of international students.

I think that these international students got intimidated by like the native students, 'cause, especially when they're like already in a group, you know. And then we--like, I personally, like, sometimes when I came here, the first time, I personally like intimidated by this group. Especially like in the dining hall, I don't know where to sit because I don't know anybody and they already know everybody, you know. And they sit like at [this] table, [that] table, [that] table in a group, you know. And then I just like, 'Wow. Where am I supposed to be?' Like, I don't want to be sitting by myself, you know, but like, so I just like approacheded them I guess. But then like they ended up being like really nice and they actually like, keep contacting with me. But then, but actually, they actually saw me in the elevator and then they actually remembered me, so I was like, I was really surprised too,

So, yeah, but I think it's just like that intimidation like, we are like, international student. And then like, especially if you can't speak English that well, you know, and then like when you try to say something to them and then you scared that they don't understand what you're talking about. -male, Southeast Asia

The intimidation that international students encounter can be overcome by a student who serves as a bridge between the domestics and internationals. An East Asian student stated that he was able to make both American and Asian friends, but his East Asian friends tended to associate with people from their same culture. He tried to open their perspective and introduce them to American students. As a bridge between the two different cultures, both the American and Asian students were able to communicate with each other and expand their group of friends.

But they [Americans and Asians] also have different opinions and different the values...They have lots of difference. It's not like bad, or, they just prefer another--for instance, in my country, they prefer to meet the same country's people. I always introduce my friends to American friends and they will get to know each other very well. I guess it's just that they need a bridge. That's what I thought. -male, East Asia

4.2.2 Working in a Group

Although domestic students are welcoming to international students, they find it easier to work with other domestic students in a study group. The domestic students mostly work with other domestic students by choice.

My [rhetoric class] group is all domestic. It's not that I don't get along with international students, but uhm, it's whoever I can easily converse with and those are mostly domestic students. -male, US

One domestic student purposely avoids working with international students because of the language barrier. For the domestic students, working with an international student adds more communication limitations. Not all domestic students are willing to put in the effort to work with these limitations.

"I try to stay away from the international kids, cause they don't speak too good English." -male, US

International students are aware that some domestic students are more open than others. For one East Asian student, although her domestic group never admitted it, she felt that her group preferred working with other native speakers. They were less willing to try to communicate with her, therefore she felt excluded from the group. Some domestic students may seem welcoming and friendly to internationals, but in an academic setting, they might be less patient to try to communicate with a non-native English speaker.

> S*ometimes the people in my group, you know, they may--some of them is American and they're kind of--you know, they just prefer to talk to the other person who is the native speaker of English. So, it's kind of frustrating. -female, East Asia*

However, groups are essential to an international student's development, because the more they talk with domestic students, the more they are able to improve their communication skills and knowledge about American culture.

> *So the only thing I can do is study with them like to help--to ask them for help. And then like at the same time, they help you in your classes and in the same time I learn English too cause automatically I'm talking in English. -male, Southeast Asia*

When the domestic and international students are able to effectively collaborate, they will naturally share their culture between each other. Students stated that if they stayed with their own demographic group, they would not be able to expand their knowledge about other cultures and opinions. Working with people of different backgrounds helps broaden one's global perspective.

> *Something that always helped me with new groups of people is that if you try to get along with the people that are like you, like you don't stand out. And if you like, get along with people that have nothing to do with you, it's actually easier to get along with them because they are interested in your culture just as much as you are interested in theirs. So here it's kind of like the same thing because if I try to get along with people that are like, have my same opinion, and beliefs, and all this, everything...we can relate in everything so we pretty much have nothing to talk about*

or I give up. But, if I talk to people that are like total different, then I stand out and they stand out to me too so, it's easier to exchange world views. -male, Latin America

4.3 Adjusting to Living

4.3.1 Roommates

Both domestic and international students had some concerns about mixing two different cultures. Even if roommates had cultural differences, they were usually able to find similarities and have a positive living experience.

All students have to adjust to living with someone who may have different cultural views than them. Differences range from interests in music, daily schedule, religious views, or being interested in American topics. When these differences become an issue, students dealt with them by going to the study rooms, lounges, or a friend's room, or by staying to themselves. Having an open mind also helped the adjustment between roommates.

We had some, or well I had some problems adjusting cause we had some differences in our beliefs, our religion. By, I think by being more open-minded, I think I can deal with it. And sometimes it gets a bit too, too uncomfortable, I can just leave. Usually I could go to the private study rooms or walk outside. -male, US

4.3.2 Food

In the focus group sessions, nine international students found it hard to adapt to Western meals. In the dormitory halls, there are fewer choices of food from their own country so they must get used to eating different styles of food. Students complained about the high calories in meals and the lack of fresh fruits and vegetables. Also, American meals times were much earlier than what they were used to at home.

I would say the food is very American. And uh, if you eat too much, it will make you fat. -male, East Asia

I think that the food, yeah that should be a huge deal. Like it's really bugging me. It's bugging me a lot. -male, Central America

4.3.3 Community

Even with the support of friends, students can often feel overwhelmed living in a large and diverse community. Students find it easier to adapt if they make their own small communities within the large communities.

I'm from a very small school. My graduating class was like, 41 people. So coming to a classroom of like 300 people, like it's very intimidating. I just sit in the front to like narrow the class down. -female, US

Like my city has, like, I think it's like 1.5 million people. But out of those 1.5 million people, there's lots of small communities. So it's very easy to get along with people and its very easy to be warm to each other. So, coming here, I don't feel the college as a huge community, but I feel it as a web of small communities. And if you see it like that, then like, my previous experience helps me to see it like that and to have a better time adapting. -male, Central America

5. Survey Results

Out of the 422 participants that responded to the survey, 420 responses were analyzed. Some students preferred not to answer some questions; at the very minimum, 336 responses were used, but mostly 415-420 responses were used. The 2-sample t-Test was used to check whether there were significant differences between domestic and international students in the number of credit hours students took and the number of hours that students spent studying. The Mann Whitney-U test was used to check for significant differences for the remaining questions where students were asked to rate a statement based on a discrete scale. Any test that produced a p value of .05 or less is considered significantly different and is marked with an asterisk (*).

Students were also able to comment on two questions:

- Do you have any comments you would like to share about your adjustment to the academic aspects of college?
- Do you have any additional comments you would like to share about your adjustment to the social aspects of college (for example, with regard to your interactions with peers or professors/TAs)?

Themes were created based on the students' comments and survey responses. With the exception of some noted comments, the quoted comments contain themes that were expressed by more than one student.

5.1 Time Management

Domestic and international students generally take the same amount of credit hours of courses during their first semester, but they use their time differently for studying. International students spend significantly more time with their humanities and social science courses (Table 5.1).

TABLE 5.1   TIME MANAGEMENT

	Domestic	International
How many semester hours of credit are you currently taking?	15.20	15.22
How many hours per week do you work outside of classes and labs for engineering, math, and science courses (homework, studying, attending office hours, etc.)?	14.45	13.37
How many hours per week do you work outside of classes and labs for humanities and social science courses (homework, studying, attending office hours, etc.)?	4.14	**5.19***

5.2 Involvement with Extra Activities

Both domestic and international students agree that it is important to be involved in extra activities, but both tend to be more involved in non-engineering activities such as sports, recreation, volunteering, etc. (Table 5.2).

TABLE 5.2   EXTRA ACTIVITIES

	Domestic	International
Rated on the scale: 1 = no involvement, 2 = limited involvement, 3 = moderate involvement, 4 = extensive involvement		
What is your level of involvement in student engineering societies (not including the International Buddies in Engineering program)?	2.02	1.94
Rated on the scale: 1 = Don't Know, 2 = Strongly Disagree, 3 = Disagree, 4 = Neutral, 5= Agree, 6 = Strongly Agree		
It is important to be involved in non-engineering activities (for example, church, civic organizations, volunteering, sorority, fraternity, sports, recreation, student government).	5.12	4.89
Rated on the scale: 1 = no involvement, 2 = limited involvement, 3 = moderate involvement, 4 = extensive involvement		
How often are you involved in non-engineering activities mentioned in the above question?	2.68	2.53

While some students commented that they did not have enough time to for

extracurricular activities because they were too busy studying, others commented that their

extracurricular activities gave them less time to keep up with studying.

There is less time to hang out so socializing more often comes in the form of a quick meal or studying. -Domestic

I'm having trouble keeping up with my classes due to the sports and Fraternity I am in. -Domestic

I hate the way teachers will speed through material in huge lectures and not revisit the material later. It is extremely difficult to be able to keep up with the material and homework, especially with an athlete's schedule. -Domestic

5.3 Working with Others

Students occasionally do homework or study in groups, but domestic students are

significantly more likely to do homework in groups, especially with students who are from

their own country ($p < .05$). Both groups of students relate with their fellow classmates, yet

domestic students feel that they have more in common with other classmates. (Table 5.3).

TABLE 5.3   WORKING WITH OTHERS

	Domestic	International
Rated on the scale: 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Often, 5= Very Often, 6 = Almost Always		
I study in groups.	2.90	3.03
When I study in groups, it is with people from my own country.	**4.39***	3.47
I do homework in groups.	**2.85***	2.52
When I do homework in groups, it is with people from my own country.	**4.42***	3.20
Rated on the scale: 1 = Don't Know, 2 = Strongly Disagree, 3 = Disagree, 4 = Neutral, 5= Agree, 6 = Strongly Agree		
I can relate to the people around me in my classes.	4.57	4.42
I have a lot in common with other students in my classes.	**4.43***	4.16

Many students were dissatisfied in different aspects with the integration of domestic

and international students. Some students expressed that they preferred not to work with

international students because of the language barrier.

> *I hate people who can't speak English on par with a native speaker; they hinder a group's effectiveness.* -Domestic

Many international students mentioned that is difficult to integrate with domestic

students who already have groups of friends. One student also mentioned that as an

international student from a less-represented country, he or she struggled with meeting other

international students from largely represented countries. The student observed that other

internationals from largely represented countries mostly associate with those from their own country instead of getting to know other students.

> *My comment is more for people from other countries (not the US) who unlike me, came to the university with lots of others from their country and hence spend most of their time together sitting together in their huge groups and not really getting to know people out of their nationality. So maybe the larger non-US groups could just gently advised to try break away from sticking together so much.* –International

An out-of-state student commented that although students were friendly, they had a difficulty integrating into the groups of students who came from the same high school. At first it was a big adjustment for the student, but with time, the student was able to make their own group of friends.

> *People here are generally nice, but have a tendency to stick close to the people who they went to high school with and not socialize much outside of those cliques. I noticed this because i am from out of state. It was frustrating and scary coming here without knowing any one but i started to find people who I enjoy hanging out with after my first week.* –Domestic

5.4 Abilities

Most students rated their abilities as average to above-average in areas such as self-confidence, leadership, public speaking, communication, and teamwork. However, international students rated their math, science, and critical thinking skills as significantly above average (Table 5.4).

TABLE 5.4   ABILITIES

	Domestic	International
Rated on the scale: 1 = Lowest 10%, 2 = Below Average, 3 = Average, 4 = Above Average, 5= Highest 10%		
Social self-confidence	3.67	3.61
Leadership ability	3.78	3.63
Public speaking	3.32	3.31
Math ability	3.85	**4.30***
Science ability	3.76	**4.19***
Verbal communication ability	3.64	3.65
Written communication ability	3.62	3.56
Ability to perform in teams	3.92	3.92
Critical thinking skill	3.96	**4.21***

Many students commented on the importance of communication and their struggles to communicate with other students. International students mentioned that their accent and lack of familiarity of language and culture causes some problems with communicating with others.

> *Verbal communication is of huge importance. Good verbal communication is needed in discussions, daily conversations, seeking jobs, problem sovling, working in groups and almost everywhere if one wants to get involved. However, it is usually tough for international students who have disadvantages in language and culture to pick up everything in a short time.* –International

> *Sometimes it takes a while for other students to understand what I'm trying to say but overall it has been a wonderful experience.* –International

Although most domestic students rated their verbal communication skills as average or above, 37 domestic students rated their skills as below average or lowest 10%. Even though domestic students are native speakers in English, some still have the challenge with expressing their thoughts with others.

Its really hard, especially if social interaction was never one's forte..sometimes I get lonely, but I'm learning alot on the way..I feel like i want to develop myself and who I am as a person before looking around for friends or focusing on making friends..but I'll take any one who's friendly enough in the meantime. –Domestic

5.5 Instructor and Advisor Support

In general, students seem satisfied by the amount of support that instructors and advisors provide. They were satisfied with the availability of their instructors and the quality of academic advising from instructors and advisors (Table 5.5).

TABLE 5.5   INSTRUCTOR AND ADVISOR SUPPORT

	Domestic	International
Rated on the scale: 1 = Don't Know, 2 = Strongly Disagree, 3 = Disagree, 4 = Neutral, 5= Agree, 6 = Strongly Agree		
My instructors and teaching assistants provide the support necessary for me to do well in engineering.	4.65	4.62
Rated on the scale: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Satisfied, 4 =Very satisfied		
Quality of Instructors	3.24	3.29
Availability of Instructors	3.17	3.26
Quality of advising by Instructors	3.23	3.22
Academic advising	3.03	3.04

While the average number of students indicated that they were satisfied with their instructors, the comments left a mixed review of the quality advising. Some students appreciated that their instructors took extra time to help their students on a personal level.

I like how the instructors are aware of the plight of first-semester Freshmen and adjust their courses to include advising as well!! –Domestic

Many other students were disappointed with the advisors who did not give them enough help with their schedule. When one student asked their advisor about the difficulty of a course, the advisor directed them to ask their friends instead.

My academic adviser is extremely unhelpful. I came in with 42 credits from AP courses. I went to see my adviser to get an opinion on the course load, but all she did was compare my schedule to the typical 8-semester schedule (which wasnt helpful at all since I was ahead of average). When I asked for her opinion of the course load, she told me to 'ask my friends'. –Domestic

Some international students expressed that they wanted more advice from their

advisors because of their unfamiliarity with campus and the American university system.

It is challenging for international students to adjust to American campus life, but this is just a matter of fact. Due to the time for adjustments, I hope that when registering for course as a first-time freshmen, advisers could pay attention to the international background. –Domestic

Some domestic students said that they had to do additional studying because they did

not understand their professor's foreign accent. Another student felt that some professors do

not connect well with students; therefore the student sought help from their friends instead.

One of my instructors has an extremely heavy accent and I can barely understand him, it is very hard to learn anything in the lecture because he is so hard to understand. I self-teach myself most of the material for the class. –Domestic

The professors seem distant in most of my classes and I find it difficult to approach them. Thus, I find it difficult to get help from them and often result to friends and classmates for help. –Domestic

5.6 Course Load

Students generally argue that their classes are challenging, but not overwhelming

(Table 5.6.1).

I think the courses are challenging and require effort and time, but it is nothing that every student accepted into engineering cannot handle. –Domestic

TABLE 5.6   COURSE DIFFICULTY LEVEL

	Domestic	International
Rated on the scale: 1 = Don't Know, 2 = Strongly Disagree, 3 = Disagree, 4 = Neutral, 5= Agree, 6 = Strongly Agree		
I find my classes challenging.	4.87	4.46
I find my classes overwhelming.	3.96	3.83

An international student had the difficulty of adjusting to the different academic level and the language barrier.

> *I have found adjusting to college academics very challenging, as my high school was a low-level school. Besides, I came from Europe two years ago, which made it even more difficult to catch up with other undergraduates (language barrier).* – International

When students had difficulty with assignments or studying, they often asked their friends more than instructors or teaching assistants. International students asked questions in class and studied their notes before class significantly more often than domestic students ($p <$ .05). (Table 5.7).

TABLE 5.7   HELP IN COURSES

	Domestic	International
Rated on the scale: 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Often, 5= Very Often, 6 = Almost Always		
My friends help me when I am having difficulty with the homework assignments or studying.	4.09	4.1
I attend the instructors' or teaching assistants' office hours when I need help.	2.65	2.92
I ask questions in class.	2.85	**3.02***
I study my notes before class.	2.6	**3.09***

5.7 Making friends

As stated before, many students felt that domestic and international students tend to stay with people from the same background as them. International students from less-represented countries have more difficulty integrating with the pre-formed groups. One student feels that he or she would adjust more easily if more activities were available for international students to meet each other.

The college should organize more activities for international and encourage them to attend those activities. I think that the college doesn't do much in helping the international students adjust to the new place. The students who adjust most easily are the ones who come in groups from their home country. –International

A domestic student expressed that he or she has a more difficult time finding other students with the same interest as them. They would like for the university to provide more activities for students of the same interest.

It's hard for the small number of student who don't go out and party to adjust to college life. The small group of us that have morals and don't want to go and get wasted every weekend generally are left alone and it's hard to find people with similar interests who fall into this same group of people. Maybe have extra-curricular workshops for students who want to develop more skills in their area of study. e.g. 1 hour session on a Saturday to work on groups to solve a software engineering problem or a group who wants to work on solving unsolved math problems. Just something to get like-minded individuals to work together on something meaningful and make friends. –Domestic

6. Discussion

6.1 Findings compared with literature

6.1.1 Making friends is important

Olivas [10] indicated that in the past, international students who made friends with host students were able to reduce their stress and adapt to American culture differences. The responses from the focus groups confirm Olivas's [10] statement. People are the key to living comfortably on campus. All focus group participants agreed that making friends right away helped them feel comfortable on campus. With friends, they had people to do activities with, people to eat meals with, and people to help them with academics or living.

International students also agreed that making friends from their own country was not enough to fully adapt to the living comfortably. Students stated that it is necessary to have domestic friends too. Even though internationals know that making domestic friends is important, if they are from a largely represented country, they still tend to have a group of friends from their same country. They usually know domestic students from their dormitory or classes, but they appreciate friends with whom they can easily communicate or share cultural values. Although Jacobs [12] noted that students from Asia and South America preferred practices from their own country, participants mentioned that they appreciate friends from their own country, but did not necessarily prefer their own culture and customs over American culture and customs.

For international students who are one of the few from their country, they usually have a diverse group of international and domestic friends. As mentioned in the Results

section, international students often feel intimidated in approaching domestic students, especially since domestic students may already have their own set of friends. When a student needs help, a student from a largely represented country has an easier time asking someone from the same cultural community. However, those from smaller communities may feel more intimidated because they must ask someone from a different background than them. Lee [4] stated that international students from less represented countries have more adjustments than largely represented countries because they have fewer people to relate to from the same community; however, the participants from less represented countries indicated that they mostly made friends with other internationals from similar regions instead to accommodate for the lack of students from their home countries.

6.1.2 Homesickness

Andrade [1] referenced past research from 2002 that found that international students feel more homesickness than domestic students because their families are farther away; thus, they have less support from their families. However, from the focus group sessions, international students did not mention homesickness as being a major adjustment factor. With today's advanced communication technology, international students are able to keep in contact with their families regularly. They can send emails, text messages, and even use Skype messenger. Advanced technology helps reduce the homesickness of reduced contact with family and friends back at home.

However, students still felt the homesickness of absence from their own countries. Although a student can feel a piece of home when talking to family and friends through

technology, they still live in an environment different from their home. International students may still miss their community, customs, and culture of their own country.

In addition, first-year domestic students also indicated that at times they missed their home, but many were able to go home on the weekends to see friends and family members. Because of traveling expenses, many international students are not able to go home until winter or summer break. While domestic students can go home during holiday weekends, most international students cannot go home and probably experience some homesickness to a small degree. However, international students generally do not suffer from constant homesickness as previously believed.

6.1.3 Language barriers

Another contract to previous research is the adjustment of the language barrier for international students. Andrande [1] stated that international students may have a more difficult time understanding lecturers because they speak quickly or use sophisticated vocabulary. As elaborated in section 4.1.1, international students did agree that there is some communication difficulty between them and instructors, but the barrier comes more from understanding different accents. Domestic students struggle with the same communication barrier as well. In engineering, many professors and teaching assistants are internationals with accents, so it takes extra effort for all students to understand and communicate with them.

As implied by Jacobs [12], international students are also more hesitant to participate in discussions in class because of their English proficiency level. The survey results show an opposite response. In fact, international students were more willing to ask questions in class.

Recently, it seems that English proficiency may be less of an adjustment issue, possibly due to more opportunities for international students to learn English in their home countries. Instead, as stated in section 4.1, international students have difficulty in communicating because they do not understand American cultural references and specific unfamiliar terms.

6.1.4 Jet lag

An international student mentioned that jet lag was a major adjustment factor for him. Jet lag is something that few domestic students will struggle with before starting school. Most domestic students go to public colleges and universities in a nearby area. International students come from all over the world and spend many hours traveling before school starts. The jet lag can take a few days to recover from. During those days, many students are meeting each other or participating in welcoming events. After recovering from jet lag, international students still have time to make friends, but they will already be behind the other domestic students who have spent time making friends and getting acquainted to the campus. The international students could also fall behind academically during the first week of classes as well.

> *And then like, I got jet lagged like first week of here, like first week of school. It was really bad. That was, that was like the first week that I like fell behind in all my classes. That's what like my math got harder and harder and I just like more left behind. But like, uh, like today I just get--got my first exams.* -male, Southeast Asia

Although jet lag can cause a student to fall behind in classes and miss the opportunity to make friends, one method that helps the students recover from negative effects from jet lag is making friends. If international students make friends with other students, they can establish their social life and receive help from their friends, who are often times their classmates.

And then when I came here like, and I was like jet lagged so I couldn't get to know anyone in here. And then when I was like in my room and I tried to do homework and I can't do it, and then I was like, "Oh, I just remembered! I don't know anybody to call." You know? But uhm, first week was really tough for me, but second week...I start to uhm, get off from my jet lag I guess. And then start to get to know a lot of people and get all their numbers so...and second week, third week got easier and easier and now it's just like great I guess. -male, Southeast Asia

6.1.5 Scheduling

Because students come from many different school systems, academic advisors occasionally make mistakes in students' academic schedules or transfer credits. Students often interpret the advisors' mistakes as being apathetic about the course scheduling process.

And they did kind of a...a poor job with you know with my schedule. On the first week of class, I had to go back and get major major changes and that was kinda stressful so...I mean, I think for as far as they go, it needs to be more of uh, get it right more than get it done attitude. -male, US

Therefore, a bad experience with an advisor leads students to asking their friends or upperclassmen for academic advice instead. Students also feel that their friends are more knowledgeable than academic advisors about class schedules.

I just consulted my engineering advisor on the day of my summer registration and he helped me select classes. Besides that, I haven't consulted anyone. I've just been hearing from my friends that--I've just been hearing that some of my friends are planning to minor in some subject. And, I'm planning to minor too in engineering physics and my friend told me how many credits you need and what all stuff is involved. So, I just keep in touch with him and I find out what stuff is needed to minor in another subject, to get another degree. -male, South Asia

International students stated that they register when they first arrive to campus. They usually come to campus right before the semester starts, so they have less choices for making their schedule. One student disliked his schedule because of the early morning classes and another student was dissatisfied with the lack of options that he had due to late registration.

Yeah. It was really really late for me to register for classes. The 8am ones were the only ones available so---male, South Asia

I would just like to contribute to that. I did mine on August 16th and I had some--I really wanted to take a discovery course in astronomy. And uhm, there was like 1 spot left and my account was on hold for like 5 minutes because of my advisor there. It took like 5 minutes to take it off hold. And then, when the like, when the like...when the account was taken off hold, I like--the last spot for the astronomy class was gone. So, I was totally frustrated. And I feel like, there should be a way for like students to be able to do things, like international students to be able to somehow register from their home country without being here in someway. Because like uhm, at least like, take your classes cause I picked a schedule that I really didn't want. -male, Central America

6.2 Finite Energy Theory

We propose a simple theory to explain the experiences of first-year students as they adjust to studying and living at a university. Students have a finite amount of energy that they can use throughout the day. The international students spend more personal energy during the first few weeks of school getting acquainted with a new culture and environment. During that period, they have less time and energy to participate in nonacademic activities. When students do not participate in activities, they miss out on making friends, keeping a balance between a social and academic life, doing a useful activity such as a service to others, expanding their knowledge and experiences, or staying healthy with exercise. A balance between social and academic life is necessary to help students enjoy their college experiences and release stress from their studies.

One international student said that at first, he did not spend much time with friends because he spent most of his time studying to keep up with his classes. He was not able to keep a balance between social activities and academics because all of his energy was absorbed in studying. His roommates were welcoming and friendly to him, but because of the time he spent adjusting to the academic life, he had limited time to develop relationships with others. This student eventually made friends and developed a social life, but before doing so, he expressed that he was quite stressed from studying all of the time. With the

finite amount of energy, each student must find a balance between social and academic life in order to adjust properly.

6.3 Alternative Explanations

The differences in adjustment difficulties for international students could depend on personality traits, attitudes and beliefs, and prior socialization. Students with a more outgoing personality would be more willing to reach out to other students and explore American culture; hence they have an easier time adjusting. Conversely, students with a more introverted personality might tend to stay with students from their own country because they are more familiar and comfortable.

Attitudes and beliefs can be an adjustment factor for international students as well. If internationals have any stereotypes about domestic or even other international students, they might not be open to integrating with that group of students. Constantine [7] found that racism and discrimination between international students was a major adjustment factor for an African student.

A major factor for adjustment is the level of Americanization that a country has. The Central American and Latin American students in the international focus groups mentioned that they were able to easily have conversations with Americans because their country was already Americanized. Students who live in countries with a strong American influence do not have as much difficulty adjusting to the language barrier. For example, in many East Asian countries, more American native speakers teach the English language in schools, so the students are more exposed than in the past to the language and culture of the United States. In the future, as international students receive greater exposure to American language

and culture, language difficulties will probably be less significant in adjusting to US universities.

6.4 Limitations

6.4.1 Survey

Originally, we expected the survey to be taken by all students as a requirement of the mandatory first-year engineering course. Students would then have the option to chose if their survey data would be used for research purposes. However, because of delays with the approval, a survey invitation was sent to the students by email. Therefore, the response was not as much as expected because students were not required to take the survey. Also, some demographic information was not included. Information such as gender and location of origin would have been useful in comparing the results. Without the demographic information, comparing the survey results to the focus group results based on location is not feasible.

6.4.2 Focus Group

Although the focus groups were generally diverse, many countries and some regions of the world were not represented. In the literature review, Constantine [7] provides research about African international students, yet our focus groups did not have any African students to express their opinions. Therefore, we cannot expand on Constantine's research. In addition to other countries, South Korea was not represented at all, even though there is a very large population of South Korean students on this campus.

7. Conclusions

This project has found evidence that first-year international engineering students have more difficulties in adjusting than domestic students in communication, interpersonal relationships, and living at a university. Language poses many problems because international students are unfamiliar with American slang, cultural references, and technical terms. International students must also become familiar with American teaching methods and assignments. Students become acquainted with the academic system by relying on their domestic and international friends. Communicating and working with other domestic students can be challenging at times, but international students usually succeed in working with other domestic students. Living and working with different types of people in a new community is something that all students must experience. International students have an additional adjustment of getting accustomed to American food. Communication, interpersonal relationships, ad adjusting to living are all areas where international students may struggle more, but with time, they are be able to adapt to the unfamiliar elements of these areas.

Even more specifically, international students differ from domestic students in how they spend their time, how they study, and their view of their academic abilities. In the first semester, international engineering students spend more time studying for humanities courses than do domestic students. They study more because they require more time to read the texts and learn about subjects that are completely new to them. Even though international students may study more for humanities courses, domestic students actually study more with other students. Domestic students are more likely to work with other students in groups. They

may be friendly to other international students, but they mostly prefer working with other domestic students. The ease of communication between domestic students is a major reason to associate with one another. Domestic students also feel that they have more in common with their classmates. Although international students did not feel the same way, they agreed that they had an above average level of math, science, and critical thinking skills.

International students face several adjustment difficulties that are less severe for domestic students. If the adjustment difficulties are not addressed, international students may really struggle with their college experiences. However, from the survey and focus group responses, the answer to adjusting well to the university is making friends and having an adjustment period time.

All the participants in the focus groups agreed that their friends were crucial in adjusting to campus. Those who struggled at the beginning of the semester improved after forming relationships with friends. Friends could also be considered as valuable as advisors because they are more available and easier to relate to. International students who make friends with other international students are able to survive the adjustment period. However, those who become friends with other domestic students are not only able to adjust more quickly, but they also are able to understand American culture and customs better. International students who adapt more quickly will have a better time living comfortably at the university and succeeding academically.

International students may need more time to get acquainted to their campuses and prepare for college before arrival. Students who come a few days before classes begin often suffer from jet lag and fall behind in their studies and making friends. Without friends, they have a more difficult time adjusting. Although bringing new international students to

campus earlier than new domestic students may incur additional costs, as one focus group participant suggested, the benefit would be worthwhile because international students will have more time to adjust to a new living situation.

8. Acknowledgments

Appendix 1

Survey Recruitment Email

Subject: Important Freshman Survey! Due Nov. 9
Body:

First-year students in engineering:

You are invited to participate in an online survey to gather research data for the undergraduate thesis project of Whitney Barnes, a senior in the College of Engineering. The purpose of this project is to investigate the differences in the adjustments of domestic and international first-year engineering students to studying and living at the university. Only students like you can provide the information needed for this project.

We expect the survey to take about 20 minutes to complete. To take this survey, click on the following link: https://illinois.edu/sb/sec/2134248. This survey will be active until November 9.

Your participation in this research will remain confidential. No personally identifying information will be disclosed. If you have any questions about the project, please contact me at loui@illinois.edu. If you are concerned about your rights as a research participant, please contact the University of Illinois Institutional Review Board at (217) 333-2670 or irb@illinois.edu.

Sincerely yours,

Michael C. Loui

Professor of Electrical and Computer Engineering

University Distinguished Teacher-Scholar

Focus Group Recruitment Email

Subject: Freshman Focus Group, Sept 28, 5pm, Register now!

First-year students in engineering:

I am writing to request your help with an important research project. The purpose of this project is to investigate the differences in the adjustments of domestic and international first-year engineering students to studying and living at the university. Only students like you can provide the information needed for this project.

You are invited to participate in a focus group interview consisting of first-year engineering students enrolled in Fall 2010. Your focus group will run from 5:00 to 6:30 p.m. on Tuesday, September 28. The session will be audio recorded. Pizza will be served at the beginning of the session. As a token of our appreciation, you will receive $10 at the end of the focus group session.

Your participation in this research will remain confidential. No personally identifying information will be disclosed. If you have any questions about the project, please contact me at loui@illinois.edu. If you are concerned about your rights as a research participant, please contact the campus Institutional Review Board at (217) 333-2670 or irb@illinois.edu.

If you are 18 years of age or older, and you are interested in participating in this research project, then please reply by e-mail to undergraduate student Whitney Barnes at wbarnes2@illinois.edu by Saturday, September 25, 2010. Only eight students will be selected for this focus group session, to represent the diversity of the students in the entire group of first-year engineering students.

Sincerely yours,

Michael C. Loui

Professor of Electrical and Computer Engineering

University Distinguished Teacher-Scholar

Appendix 2

First-Year Engineering Adjustment Survey

1. I have read and understood this consent form. *I agree to submit my survey data for research purposes.
Yes/No

2. Are you a U.S. citizen or permanent resident?
Yes/No

3. Are you a participant of the International Buddies in Engineering Program?
Yes/No

4. Do you participate in the iFoundry Illinois Engineering Freshman Experience (iEFX) program?
Yes/No

5. Did you take any courses on computer programming, robotics, or electronics prior to college?
Yes/No

6. How many semester hours of credit are you currently taking?
11 or less … 12 … 13 … 14 … 15 … 16 … 17 … 18 … 19 or more

7. How many hours per week do you work outside of classes and labs for engineering, math, and science courses (homework, studying, attending office hours, etc.)? Select the number that is closest to your estimate.
0 … 2 … 4 … 6 … 8 … 10 … 12 … 14 … 16 … 18 … 20 … 22… 24… 26… 28… 30 or more

8. How many hours per week do you work outside of classes and labs for humanities and social science courses (homework, studying, attending office hours, etc.)? Select the number that is closest to your estimate.
0 … 2 … 4 … 6 … 8 … 10 … 12 … 14 … 16 … 18 … 20 … 22… 24… 26… 28… 30 or more

9. What is your level of involvement in student engineering societies (not including the International Buddies in Engineering program)?
no involvement   limited involvement   moderate involvement   extensive involvement

(Questions 10 – 19 are rated on the following scale: Never, Rarely 15% or less, Occasionally15% - 30%, Often 30% - 50%, Very Often, 50 - 70%, Almost Always 70% or more).
10. My friends help me when I am having difficulty with the homework assignments or studying.

11. I attend the instructors' or teaching assistants' office hours when I need help.
12. I attend class.
13. I ask questions in class.
14. I come to class late.
15. I study my notes before class.
16. I study in groups.
17. When I study in groups, it is with people from my own country. (Skip if you answered ("Never" to question 16.)
18. I do homework in groups.
19. When I do homework in groups, it is with people from my own country. (Skip if you answered "Never" to question 18.)

(Questions 20 – 25 are rated on the following scale: Don't Know, Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree).
20. I find my classes challenging.
21. I find my classes overwhelming.
22. My instructors and teaching assistants provide the support necessary for me to do well in engineering.
23. I can relate to the people around me in my classes.
24. I have a lot in common with other students in my classes.
25. It is important to be involved in non-engineering activities (for example, church, civic organizations, volunteering, sorority, fraternity, sports, recreation, student government).

26. How often are you involved in non-engineering activities mentioned in Question 25?
no involvement   limited involvement   moderate involvement   extensive involvement

(Questions 27-35 are rated on the following scale: Lowest 10%, Below Average, Average, Above Average, Highest 10%, Prefer not to answer).
27. Social self-confidence
28. Leadership ability
29. Public speaking
30. Math ability
31. Science ability
32. Verbal communication ability
33. Written communication ability
34. Ability to perform in teams
35. Critical thinking skill

(Questions 36-39 are rated on the following scale: Very Dissatisfied, Dissatisfied, Satisfied, Very satisfied, N/A, Prefer not to answer).
36. Quality of Instructors
37. Availability of Instructors
38. Quality of advising by Instructors
39. Academic advising

40. Do you have any comments you would like to share about your adjustment to the academic aspects of college?

41. Do you have any additional comments you would like to share about your adjustment to the social aspects of college (for example, with regard to your interactions with peers or professors/TAs)?

Appendix 3

Focus Group Consent Form

The Adjustment Experience of First-Year International Undergraduate Students in Engineering
Michael Loui and Whitney Barnes
University of Illinois at Urbana-Champaign
September 28th, 2010

Purpose and Procedures
This research study is being conducted by Professor Michael Loui and undergraduate student Whitney Barnes. The purpose of this research is to identify the differences in the adjustments of domestic and international first-year engineering students to studying and living at the university. You are invited to participate in a focus group interview for about 90 minutes. The interview will be audio recorded and transcribed.

Voluntariness
Participation in this research is voluntary. You are volunteering to allow an audio recording and transcription of your interview to be used for research purposes. You may refuse to participate or may discontinue participation at any time. During the interview, you may skip questions that you prefer not to answer. Participation will not affect your grade in a course, status as a student, or future relationship with the University.

Compensation
In return for participation, you will receive $10 at the end of the focus group session.

Benefits and Risks
The College of Engineering will benefit from accurate information about the experiences of first-year students. Participants may benefit from reflecting on their experiences. Risks are expected to be minimal, no more than in everyday life.

Confidentiality
The audio recording of the interview will be used only for research purposes; it will not be disseminated. The data to be used in this research are limited to the interview text with associated demographic information (gender, country of origin). When the interview is transcribed, your name will be replaced by an identifying code. In the event of publication, no personally identifying information will be disclosed.
We expect each focus group participant to respect the confidentiality of the information gathered during the interview, but we cannot guarantee that individual participants will not later divulge information about what other participants said.

Whom to Contact with Questions
Questions about this research should be directed to Professor Michael Loui (phone 217-333-2595, e-mail loui@illinois.edu). Questions about your rights as a research participant should

be directed to the campus University of Illinois Institutional Review Board (phone 217-333-2670, e-mail irb@illinois.edu); you may call collect.

I certify that I have read this form, I have received a copy of this form, I am 18 years of age or older, and I
volunteer to participate in this research study.

Please print official name:

Signature:

Date:

Appendix 4

Focus group questions

1. Please say your code name (Greek letter) and where you are from.
2. Why did you choose to study engineering?
3. How much time do you spend on homework each week?
4. Do you have time to participate in clubs or social activities? If so, what do you participate in?
5. Describe your experience with working other students in the classroom or on homework.
6. What were some of the positive adjustments that you had when coming to this university?
7. What were some of the adjustment difficulties that you had when coming to this university?
8. What are some suggestions that would help a future student overcome the difficulties that you have faced?
9. What is the best aspect of being a student?

References

[1] M. S. Andrade, "International students in English-speaking universities: Adjustment factors," *Journal of Research in International Education*, vol. 5, pp. 131 – 154, August 2006, http://jri.sagepub.com/cgi/content/abstract/5/2/131.

[2] M. B. Mathis, "Adapting to achieve," *Diverse: Issues in Higher Education*, vol. 27 Issue 1, p. 13, February 2010, http://search.ebscohost.com.proxy2.library.uiuc.edu/ login.aspx?direct=true&db=aph&AN=48190739&site=ehost-live.

[3] J. Keller, "Colleges large and small help international students adjust to American life." *Chronicle of Higher Education*, vol. 56 Issue 8, pp. B20-B23, October 2009, http://search.ebscohost.com.proxy2.library.uiuc.edu/login.aspx?direct=true&db=aph& AN=45036884&site=ehost-live.

[4] J. J. Lee, "International students' experiences and attitudes at a US host institution: Self-reports and future recommendations," *Journal of Research in International Education.* vol 9 no. 1, pp. 66-84, March 2010, http://jri.sagepub.com/content /9/1/66.abstract?rss=1.

[5] J. Shin, et al., "Student and school factors affecting mathematics achievement: International comparisons between Korea, Japan and the USA," *School Psychology International,* vol 30, pp. 520-537, 2009.

[6] R. L. Hayes and H. R. Lin, "Coming to America: developing social support systems for international students," *Journal of Multicultural Counseling & Development* vol 22.1, p. 7, 1994.

[7] M.G. Constantine, et al., "Examining the cultural adjustment experiences of African international college students: A qualitative analysis," *Journal of Counseling Psychology,* vol 52.1, pp 57-66, 2005.

[8] P. Senel and M. D. Lopez, "An exploratory study of perceived discrimination and homesickness: A comparison of international students and American students," *Journal of Psychology,* vol 141.3, pp. 263-280, 2007.

[9] R. Y. Klomegah, "Social factors relating to alienation experienced by international students in the United States," *College Student Journal,* vol 40, pp. 303-315, 2006.

[10] M. Olivas and C. S. Li. "Understanding stressors of international students in higher education: What college counselors and personnel need to know," *Journal of Instructional Psychology,* vol 33.3, p. 217, 2006.

[11] A. L. Reynolds, "Cultural adjustment difficulties and career development of international college students," *Journal of Career Assessment,* vol 15.3, pp. 338-350. 2007.

[12] E. J. Jacob, "Using counselor training and collaborative programming strategies in working with international students," *Journal of Multicultural Counseling & Development,* vol 29.1, p. 73, 2001.

[13] Institute of International Education, "Open doors data," November 2010, http://www.iie.org/en/Research-and-Publications/Open-Doors.

[14] S. B. Merriam, *Qualitative Research: A Guide to Design and Implementation,* Jossey-Bass, 2009, pp. 39-208.