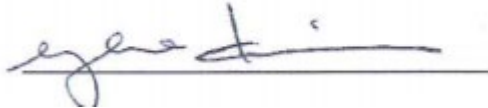


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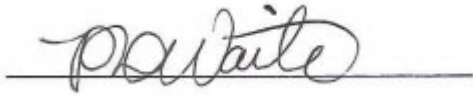
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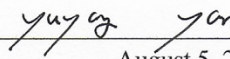
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THE RELATIONSHIP BETWEEN CHINESE INTERNATIONAL STUDENTS' TOEFL  
SCORES AND ACADEMIC SUCCESS IN HIGHER EDUCATION

by

Yuyang Yan

A Dissertation  
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## ABSTRACT

Since the 1970s, the TOEFL has been a mandatory English proficiency test that non-native English speaking students had to take to demonstrate their language proficiency to attend U.S. colleges and universities (Educational Testing Service, 2011). The current study addressed this gap in literature by examining the relationship between Chinese international students' TOEFL scores and their academic success as measured by their overall Grade Point Average (GPA). Using Astin's Input-Environment-Outcomes (I-E-O) model as the theoretical framework, the roles of other Input and Environment factors that may impact Chinese international students' GPA, independently from TOEFL, were also investigated. An explanatory mixed-methods approach was used. Through snowball sampling 201 survey participants were recruited, and interviews were conducted with a subsample of seven students. A Pearson correlation analysis found a moderate positive correlation between TOEFL score and GPA ( $r=.30$ ,  $p<.001$ ). An HLM analysis revealed that Input factors (Years Living in the U.S., Institution, Major) explained 7.7% of the variance in students' GPA. Environment variables (Self-Confidence, Study Habit) explained an additional 11.5%, when controlling for Input factors. Thus, a total of 19% of the variation in GPA was explained by Input and Environment factors alone. HLM analysis revealed that the TOEFL score was the strongest factor predicting GPA, but only explains 6.9% of the total variation. Qualitative analysis of themes showed that "language barrier" and "cultural adjustment" are two main factors influencing the experiences of Chinese international students' academic success in the U.S. in their perspective.

*Keywords:* TOEFL, Chinese international students, GPA

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## CHAPTER 1: INTRODUCTION

Since the 1970s, the TOEFL has been the mandatory English proficiency test that non-native English speaking students have to take to demonstrate their language proficiency for admission to U.S. colleges and universities (Educational Testing Service, 2011). TOEFL scores impact an international student's admission prospects, as universities often rely on them to predict the student's academic success. The maximum TOEFL iBT score that a student can achieve is 120 (Educational Testing Service, n.d.). Most universities require a minimum undergraduate TOEFL iBT score of 80, which demonstrates proficiency in English, to grant admission into a program. However, according to the U.S. News & World Report, some universities, especially the top universities in the United States, require a higher minimum score of 100. Many international students who were admitted to those universities or programs had a score close to 110 or higher (Ross, 2018). Universities, especially larger universities, receive a large number of applications. When university admission committees sieve through applications and see students with particular TOEFL scores they prefer, they are more likely to select those students for admissions. Other admission requirements such as recommendation letters, students' past experiences, and motivation are not considered as important compared to a student's TOEFL score (Kice, 2014). Universities are actually using TOEFL scores as the main predictor of international students' academic success. Universities are placing too much focus on TOEFL scores in admission decisions, which could lead to the adoption of inappropriate learning strategies and unethical practices. For example, the high emphasis on TOEFL scores for admissions has also led to issues with cheating and selling of examination answers (Redden & Jashchik, 2015). Because the TOEFL score is the key factor in the admission decision, many international students train to take this test by memorizing articles and answers to recurrent questions to get higher scores.

However, little research currently exists which examine the relationship between TOEFL scores and academic success in the higher education context empirically.

The present study seeks to address this literature gap by examining the relationship between students' TOEFL score and their academic success achieved in college as measured by the students' overall Grade Point Average (GPA). This study also examined other factors that may impact a students' GPA, such as, demographic or background factors (gender, institution, major, home city, previous learning experience, years living in the U.S., etc.) and other factors (self-confidence, study habits, and social network).

### **Problem Statement**

Research and common sense suggest that the lack of language proficiency may affect international students' academic progress (Cho & Bridgeman, 2012). However, many other factors, such as motivation, learning strategies, participation, and past learning experience may also contribute to one's academic performance (Campbell, 2015; Cerna & Pavliushchenko, 2015). Past research has shown that, when classes are taught in English, there is a positive relationship between the TOEFL score and students' academic ability (Wait & Gressel, 2009). However, a high TOEFL score does not guarantee students' future academic success; not all native speakers are academically successful. Similarly, not all international students who have high English proficiency would have high GPAs (Cho & Bridgeman, 2012). One of the factors that clearly affects students' TOEFL scores is the student's country of residence.

TOEFL scores tend to be higher for students who either come from countries where English is one of their official languages or come from countries where English is traditionally spoken. TOEFL scores could, on the other hand, harm the academic potential of students who come from countries where English is not the academic language. For example, all Indian examinees in 2015 had a mean TOEFL iBT score of 90 which is much

higher than the average score of international students from other countries. There were 132,888 Indian students studying in the U.S. in 2014, and that number increased by 24.9% in 2015 (Open Doors Report, 2016). In contrast, South Korean students who do not come from a cultural tradition of speaking English in their country of origin had a mean TOEFL iBT score of 80. There were 63,710 South Korean international students studying in the U.S. in 2014, and that number declined by 4.2% in 2015 (Open Doors Report, 2016). This pattern provides a secondary demonstration of the indirect relationship between TOEFL scores, country of origin, and U.S. university admissions. Chinese students, similarly to South Koreans, are at a disadvantage when it comes to using English as an academic language, yet there are a large number of international students from China in the U.S. It is important to understand the factors that impact their success beyond the TOEFL scores.

### **Purpose of the Study**

The purpose of this study was to examine the relationship between TOEFL scores and Chinese international students' academic performance at several universities in California. In addition, this study aimed to explore other factors that may relate to Chinese international students' TOEFL scores and academic performance. In this study, international students' academic performance was defined by their GPA, which was used as the measure of their academic success. The theory of Input-Environment-Outcomes (I-E-O) by Astin (1993) indicates that we need to include all components to understand academic achievement. Thus, we consider here that inputs are factors that students from different countries bring with them. The factors from the environment considered here are characteristics of the individual that might impact their academic achievement. This study focused on Chinese international students only as a large number of international students currently studying in the United States come from China, and their experiences represent great within-group variation.

### **Significance of the Study**

This study is significant as it has the potential to provide university admission officers, student affairs officers, and university administrators a more comprehensive view of the relationship between Chinese international students' TOEFL scores and academic success. Using Input-Environment-Outcomes (I-E-O) model as the theoretical framework, this study further explored factors that are associated with GPA. This study thus provided research evidence which has the potential to inform decisions that are taken by admission officers, student affairs officers, and university administrators in evaluating potential international students, so there is less likelihood of an overall qualified student being rejected based on TOEFL scores only.

### **Definition of Terms**

The following definitions have been given to explain and clarify the terms used in this study:

*ETS (Educational Testing Service)*: ETS is a non-profit organization developing tests such as GRE, HiSET, PRAXIS, TOEFL, and TOEIC. ETS works with education institutions, governments, and businesses worldwide to conduct research and develop assessment programs (Educational Testing Service, 2017).

*TOEFL iBT*: The TOEFL iBT is a test delivered via the internet. Examinees use test centers' computers to take their tests. Approximately 97% of TOEFL test takers worldwide take the TOEFL iBT test. ETS also provides the TOEFL PBT test that allows test takers to take the TOEFL test in a paper format (Educational Testing Service, 2017). In this study, all the participants had taken the TOEFL iBT test. Therefore, TOEFL iBT is referred to as TOEFL in this paper.

*GPA*: Grade Point Average (GPA) is a common way of measuring students' academic success in the United States. Each semester, students receive a GPA based on the grades they



earned in all of their classes during that semester. Throughout school, students also maintain a cumulative GPA. GPA assigns students' grades (A, B, C, D, F) to a number of grade points. For example, if a student receives an A grade, usually he or she receives 4 points, a B grade receives 3 points, a C grade receives 2 points, a D grade receives 1 point, and an F grade receives no point. GPA is also a significant consideration in awarding both academic and athletic college scholarships as well as financial aid. A GPA of 3.0 is considered an average high school GPA. However, top colleges and universities expect students to have an overall GPA ranging from 3.5 to 4.0, which is equivalent to an A- or an average A (The National Collegiate Athletic Association, n.d.).

*Two-Year College:* A two-year college is a higher educational institution that mostly offers degree programs of two years' duration. High school graduates who enroll in such colleges commonly obtain certificates or associate degrees at the successful completion of their program and transfers to four-year universities. Two-year colleges can be state-supported, public, or private (International Education Service, n.d.).

*Four-Year University:* Four-year universities are higher educational institutions who are eligible to offer bachelor's degrees to students. Students usually either earn a Bachelor of Arts or Bachelor of Science. Since many four-year universities offer full credit to those who complete two-year degrees at two-year colleges, many two-year college graduates transfer to four-year universities to complete the bachelor's degree in two additional years (International Education Service, n.d.).

*International Student:* International students are those students who study abroad in educational institutions under nonimmigrant and temporary visa programs after having received prior education in their country of origin (OCED, 2013).

*Gaokao:* China's National College Entrance examination is also known as Gaokao. Gaokao score is the only criterion for Chinese students to be admitted to Chinese universities.

There is no age restriction for Gaokao, however, because the test is only held in June each year, students who don't test well often redo the last year of high school to retake the test (Wu, 2019).

*SAT*: The SAT is the exam that high school students applying to U.S. colleges and universities usually take. Unlike Gaokao, students can take the SAT multiple times a year to get better scores. SAT scores are not the only criterion for admission to U.S. universities; other criteria may include high school GPA, recommendation letters, personal statements and essays, extracurricular activities, interviews, etc. (The College Board, n.d.).

*Core Courses*: Core Courses are also called core academic courses. They refer to the list of courses that provide a foundation of education. In the U.S. higher education institutions, core courses usually include English, social sciences, humanities, math, and science (Fleming, 2019).

*Tier City*: China's Tier City classification is a popular classification of Chinese cities. Foreign investors often use it as a guide to enter the Chinese market. In China, the media publications, economists, consultants, and enterprises classify Chinese cities based on several criteria such as cities' GDP, population, median income, transportation, and education. For example, Shanghai's GDP is similar to the Philippines, reaching \$469 billion, making Shanghai one of the richest cities in the world (Wong, 2019). Although there is no official tier city report from the Chinese government, tier city ranking is still a valuable tool used to identify city development level in China.

*Project 985 Universities*: Project 985 is a project set by the central government of China to develop world-class universities with advanced international standards in the 21st century. At the initial stage of the project, nine universities were included in Project 985. The second phase was launched in 2004, expanding the project to 39 universities (Project 211 and 985, n.d.).

*Hukou:* China's household registration system (Hukou) is a system that aims to control population mobility and determine the eligibility of local welfare. Hukou classifies each person as a rural or urban resident. Non-hukou migrants can work in other cities; however, changing the migrants' registered status is difficult (Chan, 2010). Non-hukou migrants also face challenges in accessing subsidized housing in the city where they work as well as their children to enroll in public schools because those benefits are reserved for those with local household registration (Chan, 2010; Chen & Feng, 2013).

*Previous Learning Experience:* A learning experience refers to a student's course, program, interaction, or other experience in traditional academic settings such as schools and classrooms, and nontraditional academic settings in outside-of-school locations and online (The Glossary of Education Reform, 2013). Previous learning experience refers to learning experiences, as described above, which happened in the past. In this study, previous learning experience specifically refers to international students' learning experience in their home country before they study abroad.

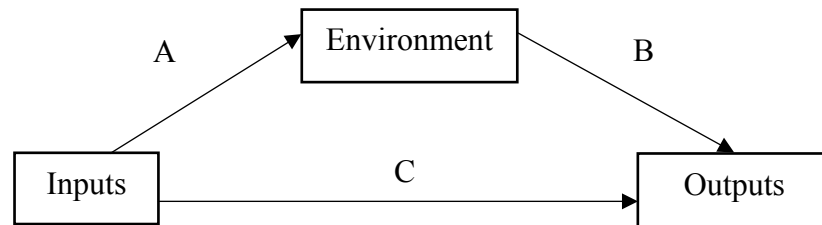
*Study Habits:* Study habits is a student's usual study behavior and learning process that includes a variety of activities such as goals, time management, study strategies, ideas, and organization (Proctor et al., 2006).

*Social Network:* Social Network is a network of social interactions (such as friends, acquaintances, and coworkers) and personal relationships (Social Network, n.d.). In this study, the social network specifically refers to the interactions and relationships of international students' with friends or schoolmates.

### **Theoretical Framework**

This study uses Astin's Input-Environment-Outcomes (I-E-O) model (see Figure 1) as the theoretical framework. The I-E-O model was developed by Alexander W. Astin (1993) as a guiding framework for assessments in higher education. The premise of this model is that

educational assessments are not accurate without the information on student inputs (I), the educational environment (E), and student outcomes (O).



*Figure 1.* Astin's Input-Environment-Outcomes (I-E-O). Adapted from "Assessment for Excellence" by A. W. Astin, 1993, Phoenix: The Oryx Press. Copyright 1993 by The Oryx Press.

Inputs are the demographic characteristics that a student brings with him when starting college. Environment relates to a student's college experience while at his or her institution and personal characteristics. These experiences include academic and non-academic aspects of college life. Outputs refer to the growth in a student's academic success after being exposed to the environment (Swing, 2001). This study uses students' overall GPA as the measurement of academic success or outcome.

### **Research Questions**

There are three major questions that this research addresses; they focus on the relationship between TOEFL score and academic success of international students in higher education settings:

1. What is the relationship between TOEFL scores and Chinese international students' academic success as defined by GPA? Is the TOEFL score useful to predict GPA of Chinese international students?
2. Are there other demographic (input) or environment factors that predict Chinese international students' GPA independently from TOEFL?
3. What other experiences influence Chinese international students' academic

success?

### **Assumptions**

This study included the following assumptions: (a) the selected Chinese international students understand and responded to the survey questions accurately and honestly; (b) the selected Chinese international students sample are representative of the population of Chinese students in the U.S.; (c) the data collection captured information about TOEFL scores and academic success accurately; (d) the data interpretation is accurate and reflected the perceptions of Chinese international students.

### **Summary**

This chapter presented the background of study (introduction), the statement of the problem, the purpose of the study, the significance of the study, the definition of terms, the theoretical framework, the research questions, and the assumptions. The purpose of this study was primarily to investigate the relationship between Chinese international students' TOEFL score and their academic success as defined by their GPA, and in doing so it aims to address a major scholarly gap in this area. This study also examined factors influencing Chinese international students' academic success. Chapter 2 presents a review of the literature. It also includes a review of the research on demographic or input factors and Environment factors associated with international students' TOEFL score. Demographic or input factors included: (a) gender; (b) native language; (c) geographic region and country; (d) previous learning experiences; (e) international students' finances; (f) tier city and GDP; and (g) regional inequity of education in China. Environment factors included: (a) self-confidence, (b) study styles, and (c) social network.

## CHAPTER 2: REVIEW OF LITERATURE

International students contribute huge revenues to the U.S. economy. There were 1.09 million international students studying in the U.S. in 2018. According to a report by the U.S. Department of Commerce, in 2017, international students contributed more than \$42 billion to the U.S. economy (Institute of International Education, 2018). More than 80% of the international students received the majority of the funds they needed to pay for their tuition and living costs from sources outside of the United States which included family support, home country government grants, and university scholarships (Institute of International Education, 2018). In addition, international students bring ethnic diversity, which has been a major focus in U.S. higher education over the past 40 years. There are two main reasons why diversity is valued in education. First, it is important to universities, especially public universities, to provide admission to students from a wider spectrum of ethnicities that are represented in society to promote social equity. Second, local students could enhance their academic and social experience at universities by interacting with students from different racial, ethnic, linguistic, and economic backgrounds (Douglass, 2014). Considering the benefit international students bring to the U.S. economy and the diversity they add, U.S. higher education institutes have been increasing their efforts to attract international students from around the world (Mamiseishvili, 2011).

When universities evaluate the application of an international student, the TOEFL score is one of the most important factors they consider in deciding whether to give him admission or not. Ginther and Yan (2018) state that many university faculty members wrongly believe that international student applicants who have met the required TOEFL score have achieved English proficiency. However, many students who meet the TOEFL requirement can hardly communicate in English (Ginther & Yan, 2018). Cho and Bridgeman (2012) point out that universities are oversimplifying the idea of student academic success by

putting such emphasis on TOEFL score (Cho & Bridgeman, 2012). In their study, Cho and Bridgeman (2012) showed that candidates who were selected by universities usually have higher TOEFL scores. The candidates with low TOEFL scores were often denied admission although their academic achievement may have been comparable or better than those who had high TOEFL scores (Cho & Bridgeman, 2012). Akanwa (2015) states that international students' previous academic achievement does not always result in successful academic performance in the United States implying that language is not necessarily more important than other factors (Akanwa, 2015). Wait and Gressel (2009) caution against using TOEFL scores as the main predictor of academic success in admissions screenings because TOEFL scores are affected by geological area and gender (Wait & Gressel, 2009), thus, impacting equity. Many factors impact international students' TOEFL score. Denying admission to students with lower TOEFL scores is probably also reducing the cultural diversity and social equity that U.S. universities aim to implement. The following review of the literature will cover factors that impact international students' TOEFL score and academic performance. Demographic factors include: (a) gender; (b) native language; (c) geographic region and country; (d) previous learning experiences; (e) international students' finances; (f) tier city and GDP; and (g) regional inequity of education in China. The literature review also covered the research on environment factors that affect international students' academic performance and success: (a) self-confidence, (b) study habits, and (c) social network.

### **TOEFL iBT Structure**

The TOEFL iBT test is divided into four sections: Reading, Listening, Speaking, and Writing. These components are equally weighted in the total TOEFL score.

**Reading**

The Reading section includes three sets of questions, each related to a common reading passage. There is a total of 40 to 60 multiple-choice questions as well as open-ended questions. The examinees are allowed to spend 60 to 80 minutes completing the Reading section.

**Listening**

The Listening section has 34 to 51 questions in six to eight sets, with two sets based on a conversation and four sets based on lectures covering academic topics. After the listening section is completed, the participants can spend up to 20 minutes responding to all Listening items. The examinees are allowed to spend 60 to 90 minutes completing the Listening section.

**Speaking**

The Speaking section is comprised of six items. Two items require examinees to express their opinions on familiar topics. The other four items combine speaking with other language tasks. Two out of the four combined tasks integrate listening and speaking skills, which require examinees to listen to a short dialogue and then to talk about the content of what they heard. The remaining two are tasks related to reading, listening, and speaking, which require examinees to read a short passage, listen to a dialogue that pertains to the passage, and then speak about what they have read and heard. For each of these items, examinees are given 15–30 seconds to prepare and 45–60 seconds to respond to each speaking question. The examinees are allowed to spend 20 minutes completing the Speaking section.

**Writing**

The Writing section includes two assignments: (a) the independent writing assignment; (b) the integrated writing assignment. The independent writing assignment



requires examinees to argue for an opinion on a topic. The integrated writing assignment, on the other hand, requires the examinees to read a text, listen to a lecture that is related to the topic, and then write on a specific topic that is based on what examinees have read and heard. The testing time for the Writing section is 20 to 50 minutes for the independent writing assignment and 30 minutes for the integrated writing assignment.

The raw scores from each section of the TOEFL iBT are converted to scaled scores ranging from 0 to 30. The total TOEFL iBT score is a simple sum of the four-scaled scores, ranging from 0 to 120 (Educational Testing Service, n.d.).

Table 1

*TOEFL iBT Test Structure*

Section	Reading	Listening	Speaking	Writing
Question format	40 to 60 questions	34 to 51 questions	6 tasks	2 writing tasks
Time limit	60 to 80 minutes	60 to 90 minutes	20 minutes	50 minutes
Score range	0-30	0-30	0-30	0-30

### **Demographic Factors**

Demographic or background factors are variables, related to socioeconomic characteristics, that have an effect on the individuals. In this study, demographic factors include gender, native language, geographic region and country, previous learning experiences, etc.

#### **Gender**

Past research points out that TOEFL scores differ by gender. According to the data summary of the TOEFL scores for the year 2015 across all countries, male examinees who took the exam to gain admission into a four-year undergraduate program had a mean score of 77. However, female examinees' mean score was 80, which meets the minimum required score of 80 expected from most U.S. universities. Male examinees who took the exam to

attend a two-year college had a mean score of 72, while the mean score for female examinees was 75. Overall, female examinees had a slightly higher mean score than the male examinees (Educational Testing Service, 2015). Breland et al. (2004) randomly examined a large sample of TOEFL examinees; they found that females for whom English is a second language had higher mean scores than males on writing tests (Breland et al., 2004).

### **Native Language**

In 1999, the American Psychological Association and the National Council on Measurement in Education suggested that the native language backgrounds of the examinees could affect their performance on foreign language tests (Lee, Breland, & Muraki, 2005). According to an Education Test Services report (2012), international students' with different native languages differed significantly in their TOEFL scores. Based on this report, students whose native language was Dutch had the highest mean TOEFL score of 100 followed by Danish, Konkani, whose mean scores were 98, then by Assamese, German, scoring 97 and then by Malayalam with an average score of 96. However, the difference between these linguistic groups lied not only in the native languages, but also in their multilingualism; all of these groups lived in countries with a high level of multilingualism with English as the most common second language they learned, often, simultaneously with their home language. Thus, students who speak these native languages are also proficient in English. For example, Konkani, Assamese, and Malayalam are three native languages spoken in India. However, English is also one of the official languages of Indians and is used very early in schools. In Denmark, 86% of the population speak English, while in Germany, 70% of the population speak English. In contrast, less than 1% of the people in China speak English (Eurobarometer Report, 2012). Unsurprisingly, Chinese students' mean TOEFL scores ( $M = 78$ ) are lower than the scores of students from these multilingual countries.

Lee, Breland, and Muraki (2005) reported about TOEFL examinees from two

different language groups, European (French, German, and Spanish) and three East Asian (Chinese, Japanese, and Korean) language groups. In total, there were 254,435 examinees as participants, out of which a total of 121,494 examinees were native speakers of three European languages, and 132,941 were native speakers of three East Asian languages. Among the three European languages, there were 66,282 Spanish examinees, followed by 28,007 French examinees, and 27,205 German examinees. Of the three East Asian groups of examinees, there were 52,112 Chinese, 43,666 Japanese, and 37,163 Korean (Lee, Breland, & Muraki, 2005). The authors found out that there was a significant mean score difference in English language ability, which was measured using the TOEFL scores in the Reading, Listening, and Speaking section. Examinees who speak one of the three European languages (French, German, or Spanish) had much higher mean scores than East Asian languages (Chinese, Japanese, or Korean). There was also a slight difference between the performance of the European group and the Asian group of examinees in the essay writing task found in the writing section of the TOEFL test. European groups still had a higher mean score than the Asian groups (Lee, Breland, & Muraki, 2005).

### **Geographic Region and Country**

TOEFL test score data summary showed that examinees from different countries achieved significantly different TOEFL scores. In 2015, out of all Asian countries, India had the highest mean score of 90, while South Korea's mean score was 80. Chinese examinees' mean score was 78. However, Japan's examinees' mean score was only 71. Examinees from Lao had the lowest mean score among Asian countries at 66. The highest mean score among countries in Africa was Mauritius which was 91. However, mean scores from 15 out of 44 countries in Africa were between 59 and 70, which was relatively low compared with other regions. Students from South America, Middle East, North Africa, and the Pacific region performed better than African and Asian students. Switzerland students' mean score was 98

out of 120, which was the highest TOEFL median score in the European countries where English is not the first language (Educational Testing Service, 2015). Again, this ranking pattern strongly suggests that the level of bilingual or multilingualism of the countries affects TOEFL scores positively. Choosing from these countries based on TOEFL scores may reflect the historical or cultural closeness between the countries, which by default limits ethnic, linguistic, and racial diversity as well as equity.

### **Previous Learning Experience**

Pre-college academic achievement plays a huge role in predicting students' learning outcomes and performance (McKenzie & Schweitzer, 2001). Eastern and western learning theories are very different; western schools emphasize the importance of understanding concepts and, not memorization (Jones & Egley, 2007). Asian countries have been using memorization for decades and have shown significantly higher test scores than U.S. students on specific subjects. For instance, according to the Organization for Economic Co-operation and Development (OECD) report, the new rankings of top countries in reading, science, and math are China, Singapore, Taiwan, Japan, and South Korea. These rankings are quite different from ranking on TOEFL scores. The United States ranks below the OECD average in reading, science, and math. Among the 65 countries, the U.S. ranked 36th in mathematics, 28th in science, and 24th in reading (Weisenthal, 2013).

In China, students are taught the ideas and methods of basic subjects in a traditional way. According to ancient educational philosophy, teachers have the job of clarifying the doubts. Chinese teachers also encourage students to work on problems with alternative solutions (Liu, 2010). Han and Ginsburg (2001) suggested that Chinese, Japanese, and Korean students might be at an advantage when learning certain mathematical concepts because of the inherent base-ten system existing in their native languages. For instance, in the Chinese language, the number 86 is represented by three characters: eight, ten, and six,

and is read as ‘eight-ten, six’ (8 multiply by 10 is 80, plus 6, is 86). These students have developed the cognitive ability to organize ideas that can help them tackle mathematical problems (Han & Ginsburg, 2001).

However, students educated in Eastern learning theories with good achievement records before college may still struggle in U.S. universities due to the different learning theories and practices they were exposed to in their countries of origin not merely because of English language barriers. Asian students’ previous academic success does not always translate to similar successes in schools in the U.S. across all subjects. For instance, Huang and Garrett (2015) visited high school classrooms in the U.S. and China, comparing the differences in teaching methods. They found that U.S. high schools are more focused on students’ comprehensive abilities. On the other hand, Chinese high schools are more focused on scientifically-based academic learning such as math and science as opposed to language arts and social sciences (Huang & Garrett, 2015).

Burch (2008) conducted research targeting international graduate students from the masters of professional accounting program offered by an Australian university. The author found that a lot of his international students did not perform well in their first year of study after coming to Australia (Burch, 2008). International students often make the assumption that their previous learning strategies, based on repetition, will work in the Australian environment, but that is not always the case (Burch, 2008). For academic writing, Abasi and Graves (2008) interviewed international students from Japan, China, and Spain. They found that although international students had academic writing experience in their home countries, they only had limited experiences of academic writing that were required in North American universities (Abasi & Graves, 2008).

Although prior knowledge is a strong predictor of academic success for national students, for international students, it is affected by pedagogical contrast between the country

of origin and the host country. Therefore, a high achieving international student may face academic difficulties in western universities (Akanwa, 2015). Watkins and Akande (1994) found that Nigerian students believe the teacher is responsible for passing knowledge on to them; therefore, they tend to follow the tasks teachers give without active learning (Watkins & Akande, 1994). A study by Huang and Garrett (2015), reported that in China, instructors spoke during the whole class, and students listened. This teaching style had a negative effect on students' participation during the classes. Students' midterm and final exams were the main criteria for grading, hence sleeping and not listening to the instructor were commonplace in undergraduate, and graduate classrooms (Huang & Garrett, 2015). When these students came to the U.S. to study, they struggled to engage in class discussions, which formed part of the grading process.

Campbell (2015) used a phenomenological approach to examine how international doctoral students acculturate to their new educational settings. In his research about international doctoral students' previous learning experiences, Campbell (2015) addressed the question, "what previous educational and life experiences affect international doctoral students' ability to decide and acculturate to U.S. universities?" (p. 287). Campbell (2015) discovered that the admiration and respect that international students had for U.S. doctoral academic programs and academic journals are the main reasons for which they chose the U.S. as a study destination. Students think that a doctorate from a U.S. institution will give them an advantage in the global labor market. Furthermore, the students were critical of the teaching styles used by professors in their home countries. The political environment in their home countries and gender inequity affecting females are some other reasons for which female doctoral students came to the U.S. to study (Campbell, 2015). In his conclusions, Campbell (2015) explains that doctoral students, coming from countries that do not value self-expression, find it difficult to contribute to class discussions. For instance, a female

Nepalese participant explained that as a female in Nepal, she was never encouraged to talk, even in family settings. The educational approach in the U.S. was opposite; professors expected students to participate in class discussions (Campbell, 2015), which was difficult for students from countries with contrasting norms.

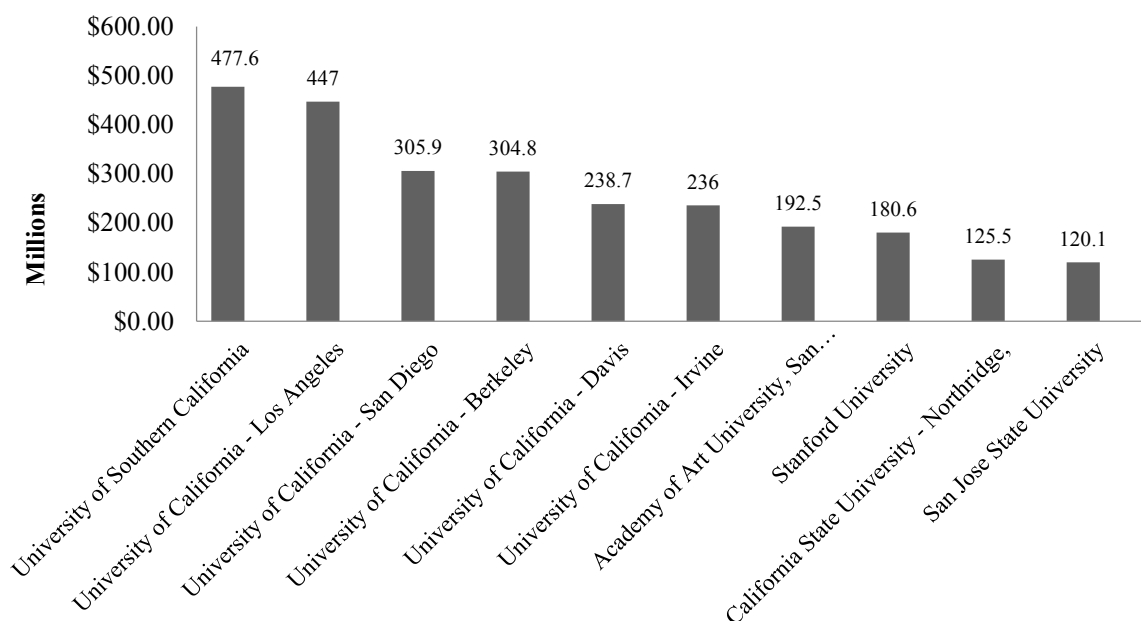
Campbell's research (2015) also reported that most of the participants were slow to integrate into American society for various reasons. For example, the university campus selected for the study comprised of a large Asian international student population; students could easily get together, which provided a sense of community. However, this also meant that Asian international students also became easily isolated from Americans and other international students. An Indian student considered this problem significant since she primarily came to America to socialize with a diverse group of people and learn about American society. Asian international students tend to talk primarily to their other Asian peers and are often, not even aware of the local news. Campbell (2015) highlighted that the students' prior cultural and educational backgrounds impacted their decision to study in the U.S. It also influenced academic acculturation at U.S. universities. Academic departments should document students' backgrounds and encourage the use of teaching materials and pedagogical approaches that would serve the needs of diverse students. They should also facilitate the formation of mentoring peer relationships where students can connect to supervisors at an individual level (Campbell, 2015). The connection between supervisors and international students could help them overcome the cultural and educational difficulties in new environments.

### **International Student Finances**

International students make up a high percentage of students in America; however, analysis of international student finances has not received any attention by governments or by

professionals in higher education. Few doctoral research and professional studies have been published about international student finances.

According to the NAFSA (2016) report, international students contributed \$5.2 billion to California alone during the 2015-2016 school year. The top 10 universities that international students contributed to include the University of Southern California; the University of California, Los Angeles; the University of California, San Diego; the University of California, Berkeley; the University of California, Davis; the University of California, Irvine; the Academy of Art University; Stanford University; California State University, Northridge; and San Jose State University (National Association of Foreign Student Advisers, 2016).



*Figure 2.* Top 10 universities in financial contribution from international students (2015-2016).

The Institute of International Education (n.d.) reports that international students receive the majority of their funds from sources outside of the U.S., including personal and family sources as well as assistance from their home countries' governments or universities (Institute of International Education, n.d.).



However, according to the United Students and United Kingdom Council for Overseas Student Affairs (UNITE-UKCOSA) report, 14% of the international students in the U.K. dropped out or considered dropping out of university because primarily one out of three had financial problems. Forty percent of international students claimed that the lack of funds or regular income and the resulting economic insecurity is the worst aspect of university life. Thirteen percent of international students have debts from student loans or need to work and study at the same time (UNITE-UKCOSA, 2006).

Telbis, Helgeson, and Kingsbury (2014) found that financial and life stresses had a negative influence on students' academic achievement (Telbis et al., 2014). Telbis, Helgeson, and Kingsbury (2014) analyzed a group of international students' financial stability and confidence to complete their program. They found out that those students who have higher financial stability have high confidence in being able to complete their programs. In contrast, students lacking financial stability demonstrate lower confidence in being able to complete their programs (Telbis et al., 2014). Forbes-Mewett et al. (2009) interviewed 200 international students from nine Australian universities to investigate international students' financial situation. Data gathered from interviews with international students showed that 61% of the money they received came from their families, 34.5% from scholarships, 32.5% from paid work, and 7% from other sources. Family support comes from spouses, parent-in-laws, grandparents, uncles, aunts, and siblings. When 200 interviewees were asked whether they had experienced financial difficulties, 63% of the students indicated that they had not experienced any difficulty because they received sufficient funds from home, were able to manage their budgets, or because they had been able to gain employment. However, 37% of these students experience financial difficulties, some experiencing major difficulties as compared to others. Students who are older than 40, experience more financial difficulties

than those who are younger than 40 as the older students usually have children living with them (Forbes-Mewett et al., 2009).

### **Tier City and GDP**

Tier 1 cities are the traditional largest and wealthiest cities in China. However, China's growing regional disparity has led some Tier 2 cities to stand out from other Tier 2 cities. Media publications and financial magazines commonly refer to these Tier 2 cities as "Tier 1.5" or "New Tier 1" cities, to show that they are not the traditional Tier 1 cities, but are also different from other Tier 2 cities (Wong, 2019). According to 21Jingji reporter Li (2018), all Tier 1 cities have a GDP of over \$300 billion in U.S. dollars. New Tier 1 cities have a GDP between \$120 billion and \$286 billion, whereas Tier 3 cities have a GDP below \$120 billion (Li, 2018).

Based on the new tier city ranking from the financial magazine, Yicai Global (2017), the Tier 1 cities include Beijing, Guangzhou, Shanghai, Shenzhen. New Tier 1 cities include Chengdu, Hangzhou, Wuhan, Chongqing, Nanjing, Tianjin, Suzhou, Xi'an, Changsha, Shenyang, Qingdao, Zhengzhou, Dalian, Dongguan, Ningbo. Tier 2 cities include Xiamen, Fuzhou, Wuxi, Hefei, Kunming, Harbin, Jinan, Foshan, Changchun, Wenzhou, Shijiazhuang, Nanning, Changzhou, Quanzhou, Nanchang, Guiyang, Taiyuan, Yantai, Jiaxing, Nantong, Jinhua, Zhuhai, Huizhou, Xuzhou, Haikou, Ürümqi, Shaoxing, Zhongshan, Taizhou, Lanzhou. Tier 3 cities include Weifang, Baoding, Zhenjiang, Yangzhou, Guilin, Tangshan, and more. Other cities are grouped into Tier 4 or 5 cities (Yicai Global, 2017).

### **Regional Inequity of Education in China**

Over the past decades, due to discrepant regional economic growth, inequity in access to higher education in China has also increased, with the majority of students studying abroad being drawn from a few wealthy regions. The economies of Central, North Western, South Western, and North-Eastern China are lagging behind that of the provinces of the

Northern or Eastern region. Tier 1 cities, Beijing and Shanghai, are also located in the Northern and Eastern region. A project ranking university, project 985, also known as the "world first-class university" project, was commissioned by the central government of China to construct first-class universities in the world. Currently, there are only 39 universities that belong to this elite group of top-ranked universities. According to the list, of project 985 universities, the majority are distributed in three regions in China; the Coastal, Eastern, and Northern regions (21 out of 39), most of these around Beijing and Shanghai. There are eight universities in Beijing and four in Shanghai. The central, north-eastern, south-west, and north-west universities which are located in large cities in the province only constitute 18 out of the 39 universities which are distributed around these four regions (China Scholarship Council, 2018). In China, high schools that feed these universities are aligned to the educational level of these higher education institutions. Students who attend these elite high schools are not only more likely to get accepted in the elite universities, but they are also more competitive in their potential admission to universities abroad due to their higher standards of education.

Moreover, U.S. children can move freely to receive public education. Due to China's household registration system (Hukou), non-hukou migrants' children who do not have local Hukou in the place they live, are not qualified to free compulsory education because education budget for local public schools are limited (Chen & Feng, 2013). There are more than 20 million migrant children in China, and this number keeps increasing (Chen & Feng, 2013). To receive higher pay, migrant parents often leave their children in their hometown to receive compulsory education while working in cities. These children are more likely to be left behind than those who receive an education in the cities. All these issues directly undermine the goal of social equity as well as ethnic diversity.

### **Factors Affecting International Students' Experiences**

Demographic factors are background characteristics or pre-college variables.

Examining these factors is useful in understanding how students adjust to college (Backhaus, 2010). There are several demographic factors reported in research that affect international students' experiences in the United States, such as students' background, previous learning experiences, financial situation, etc. In the following literature reviews, environment factors covered include self-confidence, study styles, and social networks.

#### **Self-Confidence**

International students came to a new environment alone without their families and home country friends. Past studies showed that international students often experience stress when faced with unfamiliar cultural environments, different educational systems, and languages. They also face issues with social acceptance, homesickness, isolation, and reduced self-confidence (Campbell, 2012; Lashari & Awang-Hashim, 2018). Since the different environment could affect their self-confidence level, this study considers self-confidence as one of the environment factors.

There are many definitions of self-confidence that have appeared in the literature over the years. Weinberg and Gould (2003) defined self-confidence as an individual's belief that he or she could perform an expected or a desired behavior (Weinberg & Gould, 2003). Napoli et al. (1992) described the behavioral characteristics of high self-confidence and low self-confidence. Students with high self-confidence are defined by active engagement, responsibility, enjoyment of teamwork, openness to opportunities, acceptance of own and others' success, and better work-life balance. On the other hand, individuals who have low self-confidence are less likely to accept constructive criticism, to learn from their own failure, to show competence in decision-making and creative values (Napoli et al., 1992).

In a study conducted by Telbis et al. (2014), data from 137 international students who were from a mid-western university in the United States were analyzed. The authors conducted a survey study about academic ability, language barriers, financial needs, and social adaptability. They found that international students who claimed to have high confidence in completing their programs of study have, overall, higher confidence in their academic ability. On the other hand, international students who claimed to have low confidence in completing their programs of study expressed lower confidence in their academic ability. A comparison of the perception of academic ability among participants with high confidence and low confidence revealed statistically significant differences in their academic success (Telbis et al., 2014). Nora and ERIC Clearinghouse on Urban Education (2001) also found that academic self-confidence was significantly related to GPA. Students with the same academic background who had greater confidence were more likely to achieve higher grades in their academic abilities (Nora & ERIC Clearinghouse on Urban Education, 2001).

### **Study Habits**

Proctor et al. (2006) defined study habits as students' usual behavior of studying and learning process (Proctor et al., 2006). Studies conducted over the years have examined the relationship between study habits and academic success, and also identified factors that impact study habits. Gordon (1997) states that an organized and supportive school environment would influence students' study habits and promote academic success (Gordon, 1997). McFadden and Dart (1992) evaluated 143 undergraduate business students on time management skills and academic performance. The authors found that study habits and total time spent studying affect grades (McFadden & Dart, 1992). However, Nonis (2006) further concluded that academic performance is not only influenced by how much time a student spends in studying but also by how effectively that time is spent.

Cerna and Pavliushchenko (2015) conducted class observations and interviews with a group of international students at Donghua University in Shanghai. Students were enrolled in the bachelor's program for non-Chinese international students in China which was fully taught in English. Participants were randomly selected. Classroom observations revealed that under the same conditions such as the same professor, subject, teaching system, administration, enrollment criteria, time of the day for a specific course and education level, some students performed well while others did not (Cerna & Pavliushchenko, 2015). The conclusion they came to after analyzing the differences between high and low performing students was that they have different study habits. The authors found that high and low performing students showed different study habits. High performing students ask professors questions when they don't fully understand, and they usually submit assignments on time and are willing to receive feedback about their assignments. They also seek the help of professors after class when they are confused about some concepts, and for most of them, they sit at the front of the classroom and usually don't miss classes (Cerna & Pavliushchenko, 2015). In contrast, low performing international students usually remain quiet in the class unless professors call them. Many low performing international students miss three or more classes per semester. They are usually late and sit at the back of the classroom. They also rarely ask professors questions after class-hours (Cerna & Pavliushchenko, 2015).

From the interview, high performing international students have higher scores in the following study habits and materials: (a) reading textbooks and supporting materials; (b) interact and attend a group study with students from other countries; (c) feel proud of their grades; (d) have a regular study schedule and study in silence; (e) read textbooks or materials before lecture; (f) review notes before exams; (g) prepare well and put extra effort before exams; and (h) have been previously exposed to cross-cultural environments (Cerna & Pavliushchenko, 2015).

## **Social Network**

Moglen (2017) studied first-year international graduate students' social network and academic writing support. The author found that international students tend to gravitate towards co-nationals in social settings. Moglen interviewed Kira, a Ph.D. student in the department of nutrition who was originally from China. The interview revealed that Kira's social environment mostly consisted of co-nationals, and lacked host country national associates. Kira explained that as long as she had a Chinese friend, she would ask him or her for help because there were no language barriers. By having a co-national as a friend, colleague, and helper, she was able to get linguistically accessible help, and she could do so in a way that did not involve cultural or linguistic barriers (Moglen, 2017). Moglen's study shows that international graduate students first sought writing support from co-national classmates or friends, then from professors, and last from writing tutors, etc. Another interview by Moglen (2017), this time, with Q, a Korean master's student studying veterinary medicine revealed that student Q's U.S. classmates helped considerably as he thought international students were not so good at writing English. However, they also thought this approach could be prejudice against Asian students. He felt that Asian students are good at math and statistics, so he thought he could help in that area. Asian students help each other and fill their skill deficit (Moglen, 2017). From this qualitative data, it seems that help is valued differently for the different subjects. It also seems that communication and cultural differences affect the way that international students interact with English native speakers.

## **Summary**

The research suggests that the TOEFL score may not be the only way to predict students' academic success. TOEFL tests and score data summary for the 2015 year showed a significant difference between the TOEFL score based on factors such as gender, geographic region, and native country. The data showed that on average female examinees

usually have a higher mean score than male examinees. Lee, Breland, and Muraki (2005) also reported that examinees who speak three European languages (French, Germans, and Spaniards) and had Multilanguage education had much higher mean scores than those who speak East Asian languages such as Chinese, Japanese, and Korean (Lee, Breland, & Muraki, 2005).

Burch (2008) found that students' prior learning strategies based on memorization do not work in western universities (Burch, 2008). Abasi and Graves (2008) found that, although international students were familiar with the academic writing in their home countries, they had limited experiences of academic writing that were required in North American universities (Abasi & Graves, 2008). Many researchers also found a significant relationship between students' previous experience and academic success. Nora and ERIC Clearinghouse on Urban Education (2001) reported that there is a strong relationship between students' self-confidence and GPA (Nora & ERIC Clearinghouse on Urban Education, 2001). Based on observations and interviews with international students in Shanghai, Cerna and Pavliushchenko (2015) found a positive relationship between academic success and study habits. High performing international students tend to ask professors questions, submit assignments on time, and are willing to receive feedback about their assignments. In contrast, low performing international students tend to be late or miss classes (Cerna & Pavliushchenko, 2015). However, these habits worked in Eastern universities, other cultural differences in the way professors and students interact, like, arguments and discussions might be a more valuable learning strategy in western university contexts.

International students who have financial and living stresses experienced a negative impact on their academic success (Telbis et al., 2014). In social settings, international students tend to hang out and seek help from peers or friends from the same nation (Moglen, 2017). The next chapter is the methodology chapter of this study, including sections on the



sample of participants, sampling procedures, instrumentation and measures, validity and reliability of the data collection process, data analysis and ethical issues.

It is clear that language and cultural barriers could impact the social capital of international students in the U.S. It is also unfortunate that the challenges they face in adapting to a different culture impacts their academic performance negatively. For example, if students do not feel comfortable participating in class, they do not interact frequently with American students and do not seek help, they may not acquire the skills needed to succeed in American classrooms even if their TOEFL scores were high. These environment factors, as well as the input factors described above, are considered here as we seek to gain a more comprehensive understanding of their experiences in the U.S.

### CHAPTER 3: METHODOLOGY

The purpose of this mixed-methods explanatory project is to study the relationship between TOEFL scores and Chinese international students' academic performance, which is defined by GPA, at universities in California. In addition, factors that impact Chinese international students' TOEFL scores and academic performance beyond TOEFL scores (i.e., individuals' demographic characteristics, self-confidence, study habits) were also explored here. The study consists of two parts. The first part is quantitative, involving the collection of survey data on a snowball sample of 201 Chinese students across four-year colleges in Southern California. The second part, which is qualitative, focuses on the analysis of data from open-ended questions in interviews held with Chinese international students who volunteered to follow up with an interview after they completed the survey part. This chapter covers nine subsections including (a) selection of participants; (b) sampling procedures; (c) instrumentation and measures; (d) data collection; (e) data analysis; (f) strategies for validating findings; (g) ethical issues; and (h) summary.

The specific research questions addressed by the quantitative part were:

1. What is the relationship between TOEFL scores and Chinese international students' academic success as defined by GPA? Is the TOEFL score useful to predict GPA of Chinese international students?
2. Are there other demographic (input) or environment factors that predict Chinese international students' GPA independently from TOEFL?

The qualitative question addressed here was:

3. How do Chinese international students perceive their experiences in U.S. colleges in relation to academic success?

### **Selection of Participants**

The 201 international student participants in this study were selected using snowball sampling, which allowed the researcher to get a fair sample size. A survey designed by the researcher was administered to the participants. In this study, the researcher initially conducted a pilot study with a voluntary subsample of participants. Their survey responses and interviews were used to increase the internal reliability of the research instrument. Several other strategies were also used to ensure an appropriate sample and increase the validity and reliability of this study as outlined in this chapter. For instance, validity was achieved by pre-testing the research instrument and enlisting the help of another coder for the qualitative portion of the study. Furthermore, purposeful recruitment was conducted to increase the number of students from one of the major two universities.

The sample for this study was drawn from public and private four-year universities in California. These universities have a large number of international students from all over the world. The researcher used snowball and purposive sampling to recruit participants. Only international students who were officially accepted by undergraduate and graduate programs were considered. Exchange international students, visiting international students, or international students who study credential programs and English programs at extension centers were not considered. By using these criteria, the researcher received 201 completed surveys by the end of the data collection phase of the research, which lasted from November 2018 to January 2019.

The sample for the interviews consisted of seven voluntary international students from public and private universities in California. Since confidential information such as participants' GPA and background information was collected in this research, the participants signed an agreement where the terms of confidentiality and voluntary participation were specified.

### **Sampling Procedures**

This study used snowball sampling to recruit international student participants. Snowball sampling is also called chain-referral sampling. This method is commonly utilized to find, access, and involve people from certain populations in cases where the researcher might have trouble in creating a representative sample of the research population. Snowball sampling is probably the most effective method to access populations that are difficult to reach (Valdez & Kaplan, 1999). The researcher found it challenging to find a representative number of international students appropriate for this study on her own as some students take the IELTS (The International English Language Testing System) instead of the TOEFL test. Universities are also hesitant to give out or allow research with international students. Given that the researcher is herself a Chinese international student, snowball sampling allowed the researcher to leverage her connections to access a greater number of undergraduate and graduate international students' as her peers recruited other students they knew into the study. This method proved to be an excellent strategy for her to increase her sample size of participants. The first level of participants were Chinese international students that the researcher knew, and the second level of participants consisted of the referral from the first level participants. After the initial data collection was completed, it was clear that the majority of the participants were attending a local public university close to the campus which the researcher attended, the University of California, Irvine (UCI). Given that a large number of Chinese international students also attended a similar university in the area, the University of California, Los Angeles (UCLA), the researcher visited UCLA public places where she personally invited Chinese students to answer her survey online. This strategy was used to increase the number of participants from at least two similar universities that host a large proportion of Chinese international students, UCI, and UCLA.

### Instrumentation and Measures

To date, only a limited number of studies that address the relationship between TOEFL scores and GPA have been published in scholarly research (Cho & Bridgeman, 2012; Ginther & Yan, 2018; Wait & Gressel, 2009). None of these existing studies disclosed validated survey questions which the researcher could adapt. Therefore, this researcher used a self-created survey based on the literature review presented earlier.

Based on the research questions and literature reviews, the researcher designed a survey consisting of short-answer and Likert-style questions. The survey contains five sections which comprise 29 questions altogether. The first three sections consisted of demographic short-answer questions aimed at collecting information about possible extraneous variables representing the individual's background that may be relevant to academic achievement of international students. It also includes questions about the TOEFL score, GPA, and socioeconomic factors of the student. The measure used for academic achievement is the current GPA of the students. The independent or predictor variable is the students' TOEFL score. The information collected in this section was analyzed using linear regression analysis to answer the quantitative research questions about the relationship between TOEFL scores and GPA.

The fourth and fifth sections of the survey consisted of Likert-style questions which relate to the second quantitative research questions of this study which is focused on the factors that associate with international students' TOEFL score and academic success. The Likert scale consists of five points (i.e., 1 = *strongly agree*, 3 = *neutral*, and 5 = *strongly disagree*). The scale is negative trending (high to low). Therefore, all negative correlation coefficients actually mean a direct positive relationship. The fourth and fifth sections focused on the students' environment factors (i.e., self-confidence, study habits). These data were used to analyze, through the use of linear regression, the relationship between students'

characteristics and how these factors associate with GPA independently from TOEFL scores (see Appendix B).

An open-ended questionnaire with selected questions that merit more in-depth responses was used to interview a subsample of students who volunteered to share their personal experiences as Chinese international students in the U.S. in person or over the phone (whichever they preferred). After the quantitative surveys were collected, the author asked the participating students whether they wanted to participate in a follow-up interview. There were seven participants who agreed to participate. Data from these interviews were used to validate the interpretation of results from our quantitative analysis and to gain a better understanding of their qualitative experiences as students in the U.S.

The instrument used in the qualitative portion of the study was semi-structured, open-ended interviews, which included both structured and unstructured questions. Gall, Borg, and Gall (1996) reported that semi-structured interviews allow participants to answer deeply and give researchers more flexibility than structured interviews (Gall et al., 1996). Each interview was limited to 30 minutes. The interviews included ten open-ended questions, including questions about participants' TOEFL score and GPA, study habits, previous learning experience, background, and household economic factors (see Appendix A). Qualitative researchers also examine various types of data, including archive documents. Creswell (2013) suggests that researchers should address demographic information in both qualitative and quantitative research to provide readers with a complete picture of participants (Creswell, 2013). Therefore, the researcher used a demographic data chart to summarize the demographic information asked of all interview participants.

### **Validity and Reliability**

Validity is the degree to which an instrument measures what it is supposed to measure. TOEFL is a valid standard test introduced since the 1970s. GPAs, on the other

hand, may not be as valid as the TOEFL. For example, students from top universities may find it more challenging to get an A as compared to students in other universities. Although GPA is not as valid as TOEFL, it is still the most commonly used criterion in the measure of students' academic success.

Internal reliability is the degree to which an instrument consistently measures whatever it is supposed to be measuring (Lunenburg & Irby, 2008). The researcher piloted the survey with two of her friends, undergraduate Chinese international students, to ensure that it was clear to them and that they interpreted the questions in the same way. After receiving feedback from her friends, the researcher modified the questions and tried to reduce the errors that could be derived from different interpretations. For example, the participant who had the lower TOEFL scores told the researcher that it was embarrassing to specify her score in the presence of the researcher. Her embarrassment could, in turn, affect the validity and reliability of the study. For the actual study, the researcher thus decided to use SurveyMonkey, the online platform, to disseminate the survey to preserve the anonymity of the participants. Participants received online invitations and an electronic version of the informed consent forms. At the beginning of the survey, participants were prompted to click a box stating that they are aware that both confidentiality and anonymity would be preserved.

### **Data Collection**

The researcher used snowball sampling in an attempt to increase the response rate of the survey, starting off with a voluntary sample of participants within the researcher's immediate circle while aiming to reach more than 200 returned surveys by the end of the data collection phase. The front page of the online survey briefly introduced the study and a confidentiality and anonymity agreement. Once participants clicked to show their agreement to participate, the survey automatically began. The survey, on average, took 10 to 15 minutes to complete. To prevent missing data, the author set up all questions as required answer

questions on SurveyMonkey, which means that if participants forgot to answer one question, they could not move to the next question. There was a total of 205 participants who completed the quantitative survey. However, four participants' data were removed from the data set because of a large number of invalid answers (e.g., input 0 to all short answers questions). Therefore, a total of 201 participants completed the survey fully by the end of the data collection. There were 92 participants recruited by the author personally, and 113 of them were recruited by the author's friends.

The qualitative method of data collection incorporates face-to-face interviews and open-ended questions. All interviews were audio-recorded to ensure accuracy. In this study, the researcher's roles were that of the interviewer, audio-recorder, audio-transcriber, reporter, and analyst. The following procedures were used to collect data:

1. The researcher asked if the participant preferred an interview that is face-to-face or telephone. She also explained the details of her research to the participants.
2. Before the interview, the participant was requested to sign an agreement to show his consent to participate; the terms of confidentiality and voluntary participation were specified on that form.
3. The researcher recorded each interview using a specific recording software in-built on her Mac Computer and transcribed the interviews using an online transcription tool, SONIX. Due to the accent of participants, SONIX could only transcribe 60% of the transcripts correctly. The researcher listened to the audios and read through the transcripts to correct errors and ensure accuracy. Also, peer debriefing and interrater reliability have been used as a validation procedure.



### **Data Analysis**

Research Question 1. What is the relationship between TOEFL scores and Chinese international students' academic success as defined by GPA? This question was answered by a simple Pearson Correlation analysis between the students reported TOEFL scores and their GPA.

Research Question 2. Are there other demographic (input) or environment factors that predict Chinese international students' GPA independently from TOEFL? This question was answered by hierarchical linear regression analysis using three models as informed by IEO theory. The factors investigated in these models were selected using, first, a theoretical approach by including factors that were found to be relevant to the academic achievement of international students. The second step was to use an empirical approach by including only those factors that in this sample that were positively and significantly correlated to their GPA. The first model included demographic factors such as education level, home city, and years living in the U.S. The second model looked at environment factors; study habits, self-confidence, and study support. The third model included the main predictor, TOEFL scores.

Research Question 3. What factors influence the experiences of Chinese international students' academic success in the U.S.? This question was addressed by the data from qualitative interviews. From the literature review outlined in Chapter 2, the researcher found that demographic or input factors (gender, previous learning experience, household economics, geographic region, etc.) and environment factors (self-confidence, study habits, and social network) could influence international students' TOEFL score and academic performance. Therefore, the author also included these themes in the interview questions. The qualitative analysis of data included analyses of the similarities and differences between participants, coding and categorizing, and constant comparison. During the qualitative part of the research, content analysis is used as the research methodology to explore students'

experiences. Creswell (2013) also suggests that coding within a phenomenological study should focus on the personal experiences and the “what” and “how” of the phenomena experienced (Creswell, 2013). First, the researcher used the online transcription tool, SONIX to transcribe the interviews to facilitate coding. Then the researcher listened to the audios and read through each transcript to ensure accuracy and corrected errors. Secondly, the researcher coded all the transcripts and developed themes for each open-ended question. Each answered was coded at the phrase level, so there could be more than one theme per answer. Thirdly, the second coder who was trained by the researcher read and coded each transcript. Finally, the researcher and the second coder checked each other’s codes, followed by discussed agreement and disagreement. If both agreed, then the new agreed-upon code was used. If an agreement was not reached in the second coding, then, the researcher decided on the code to be used.

### **Strategies for Validating Findings**

Whittemore et al. (2001) claim that the primary validity criteria that should be considered in qualitative research include: credibility, authenticity, criticality, and integrity. Triangulation is another method used by qualitative researchers to increase the validity of their research (Whittemore et al., 2001). Erlandson et.al (1993) further state that peer debriefing can “build credibility by allowing a peer who is a professional outside the research context and has some general understanding of the study to analyze materials, test work hypotheses and emerging designs, and listen to the researchers’ ideas and concerns” (Erlandson et al., 1993, p.140). Therefore, before the coding process, the researcher trained the second coder, who is a professional outside the research context to code the data from the pilot. When consensus was reached between the researcher and the second coder while analyzing the pilot data, the data from the subsample was coded independently by the second coder. Inter-coder reliability has also been used as a validation procedure. The inter-coder

reliability was calculated after each transcript, and the average kappa coefficient for all transcripts was higher than 80%.

### **Ethical Issues**

Erlandson et al. (1993) state “ethics in research is not a cumbersome ‘add-on’ to the naturalistic inquiry, but a logical outcome of the paradigm” (Erlandson et al., 1993, p. 132). The ethical issue which may arise in this study is related to integrity and trust. A high level of trust from participants is the researcher’s primary concern. The researcher believes that without a high level of trust, the authenticity of the qualitative data may be affected because interviews gather personal information such as the TOEFL score, GPA, and family background. Therefore, the researcher designed an agreement for participants to sign on which she outlined how confidentiality maintained.

### **Summary**

This chapter restated the purpose of the research and the research questions. The interview and survey participants were chosen from public and private four years’ universities in California. The instruments of this research are open-ended, semi-structured interviews, and a Likert-style survey. Validity and reliability of the research instruments were also covered in this chapter. Both qualitative and quantitative sampling, instruments, and data collection procedures were discussed. A plan for data analysis to answer each of the research questions investigated here was presented. The results of data analysis are presented in the next chapter.

## CHAPTER 4: RESULTS

This research aimed to investigate the relationship between TOEFL scores and Chinese international students' academic performance at four-year universities in California. The additional purpose was to explore factors that associate with international students' academic performance beyond TOEFL scores. There were three main questions which guided this study:

1. What is the relationship between total TOEFL scores and Chinese international students' academic success as defined by GPA? (Is the TOEFL score useful to predict GPA of Chinese international students?)
2. Are there other demographic (input) or environment factors that predict Chinese international students' GPA independently from TOEFL?
3. How do Chinese international students perceive their experiences in U.S. universities in relation to academic success? (What factors influence the experiences of Chinese international students' academic success in the U.S.?)

In this chapter, the author report on a Pearson correlation analyses used to examine the relationship between TOEFL scores and Chinese international students' GPA. A Hierarchical Multiple Regression was used to explore input and environmental factors previously found to be associated with students' GPA beyond TOEFL scores. Follow-up interviews were coded for themes using grounded theory to learn about the participants' perception of their educational experience in the U.S. This chapter starts with an overview of the participants' demographic information.

### **Participant Demographics**

The participants in this study were current Chinese international students at four-year universities or graduate schools in California. Their educational background, the home city

which they are from, funding sources as well as other demographic information are discussed in the following sections as input factors.

### **Sampling and Participants**

A snowball sampling procedure was used here. The first level of participants consisted of Chinese international students that the researcher knew, and the second level of participants were the referral from the first level participants. There were a total of 205 participants who completed the quantitative survey between November 2018 and January 2019. The data from four participants were removed because of invalid answers. Thus, in the current study, a total of 201 participants with 104 females and 97 males fully completed the quantitative survey.

A total of 12 four-year universities were included in this study. The majority of participants were from two large public universities. Sixty percent of the participants were students at the University of California, Irvine ( $n = 121$ ). This was probably because of the sampling procedure (snowballing) since the researcher has direct contact with this university. Twenty-four percent of the participants were students at the University of California, Los Angeles ( $n = 48$ ). The researcher actively recruited these participants to have a better representation of the institutions that large numbers of international students attend. Six percent of the participants were students at Concordia University, Irvine ( $n = 13$ ). Five percent of the participants were students at the University of California, Davis ( $n = 10$ ). Five percent of the participants were students at other universities ( $n = 9$ ). More than half of the participants were in their freshmen and sophomores years (63%).

According to reported education levels, 80% of the participants were undergraduate students ( $n = 161$ ) while 20% were graduate students at both the master and Ph.D. levels ( $n = 40$ ) attending graduate programs at the same institutions as the undergraduate students. Participants were asked how long they had been living in the U.S. Fifty-five percent of the

participants had been living in the U.S. for less than three years ( $n = 110$ ). Forty-five percent of the participants had been living in the U.S. for three years or more ( $n = 91$ ). Participants were enrolled in various majors; A total of 52% of the participants were pursuing STEM (Science, technology, engineering, and mathematics) majors ( $n = 105$ ) whereas 48% of the participants were in non-STEM majors ( $n = 96$ ). Engineering-related majors (computer engineering, electrical engineering, environmental engineering, etc.) were the most popular majors in STEM fields at 27% ( $n = 54$ ). In non-STEM fields, business-related majors (Finance, Management, Marketing, etc.) were the most popular at 28% ( $n = 57$ ). Only 3% of the participants were majors in humanities such as fine arts and English ( $n = 6$ ).

### **Home City in China**

Tier city is the tool to identify city development level in China based on cities' GDP, population, median income, transportation, and education. Research reports financial and educational gaps between Tier 1 cities and Non-Tier 1 cities. There are four cities that are Tier 1 cities: Beijing, Shanghai, Guangzhou, and Shenzhen. Non-Tier 1 cities are cities such as Xi'an, Hangzhou, and Wuhan, Chongqing. (Yicai Global, 2017).

Among the 201 participants, 35% were from Tier 1 cities ( $n = 71$ ) in China. Sixty-five percent of the participants were from Non-Tier 1 cities ( $n = 130$ ).

Non-Tier 1 cities, including New Tier 1 cities, Tier 2 cities, Tier 3 cities, Tier 4 cities, etc.

The author found that no participants were from Tier 4 or 5 cities (see Table 2).

The Pearson product-moment correlation carried out ( $n = 201$ ) showed that there was a statistically significant correlation between participants' home city (Tier 1 city vs. Non-Tier 1 city) and TOEFL score,  $r(201) = .15, p < .05$ . It seems that the TOEFL score of a Chinese international student is affected by where the student comes from, whether a more developed or less developed city.

Table 2

*Demographic Data for Participants (n = 201)*

Participant Variable	Categories	Counts	Percentage
Gender	Female	104	52
	Male	97	48
Education Level	Undergraduate	161	80
	Graduate	40	20
Year in Program	1st Year	67	33
	2nd Year	61	30
	3rd Year	38	19
	4th Year	33	17
	5th Year	2	1
Years Living in the U.S.	< 1 Year	32	16
	≥ 1 Year	40	20
	≥ 2 Years	38	19
	≥ 3 Years	37	18
	≥ 4 Years	20	10
	≥ 5 Years	34	17
Institution	UCI	121	60
	UCLA	48	24
	Other University	32	16
Major	STEM	105	52
	Non-STEM	96	48
Home City	Tier 1 City	71	35
	New Tier 1 City	55	27
	Tier 2 City	46	23
	Tier 3 City	29	15

### **Gao Kao and Financing**

About 82% of the participants responded that they had not taken the GaoKao exam (China's National College Entrance Examination) before ( $n = 164$ ). For this reason, only the TOEFL was used here as a predictor. As seen in Table 3, 85.4% of the participants were paying their tuition using mainly family support ( $n = 187$ ) whereas only 10% of the participants were paying their tuition using scholarship funds ( $n = 22$ ).

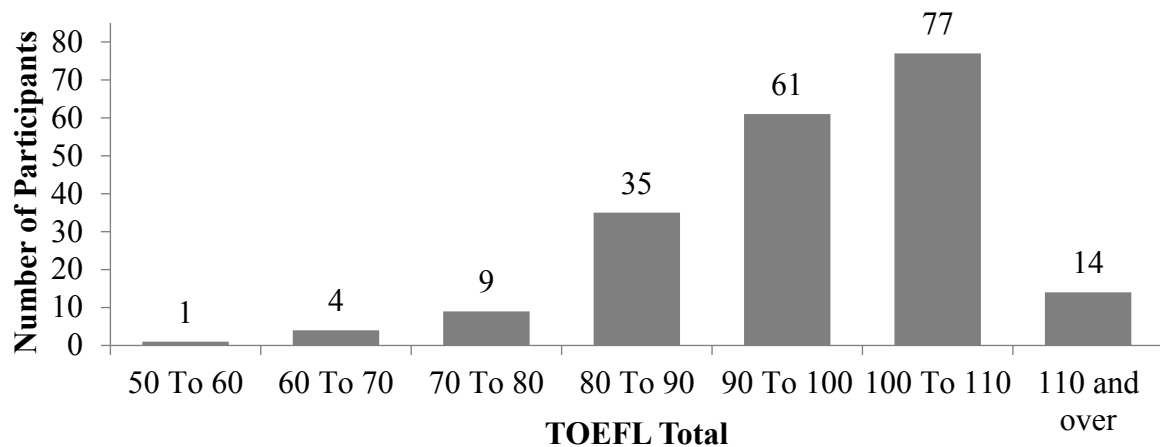
Table 3

*Frequency Table for Sources of Tuition Financing*

Source of Tuition Funds	<i>n</i>	Percent	Percent of Cases
Family	187	85.40%	94%
Scholarship	22	10%	11.10%
Loan Personal Saving	7	3.20%	3.50%
Loan	2	0.90%	1%
Other Sources	1	0.50%	0.50%
Total	219	100%	110.10%

**TOEFL**

All participants in this study took the TOEFL iBT test. Therefore, the results are referred to as the TOEFL iBT test scores. The raw scores from each section of the TOEFL iBT ranged from 0 to 30. The total TOEFL iBT score ranged from 0 to 120 (Educational Testing Service, n.d.). Among a total of 201 participants, the majority of participants ( $n = 77$ ) had TOEFL scores ranging from 100 to 110 (see Figure 3). There were 61 participants who scored in the range of 90 to 100 ( $n = 61$ ). Thus, of students who got accepted in U.S. universities, 138 or 69% scored 90 or above in the TOEFL, which is higher than the average score for China as a country.

Figure 3. TOEFL Scores ( $n = 201$ ).



The average Chinese score for the TOEFL is 79 (Educational Testing Service, 2017).

In the TOEFL subsection scores, standard deviations and means across the subscales are similar (see Table 4).

Table 4

*Descriptive Statistics for TOEFL Total Score and Subsection Score*

TOEFL Component	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Mdn</i>	<i>Minimum</i>	<i>Maximum</i>
Reading	201	25.24	3.58	25	12	30
Listening	201	24.65	3.50	25	14	30
Speaking	201	23.19	3.22	23	11	30
Writing	201	24.36	3.41	25	10	30
TOEFL Total	201	95.91	10.96	98	55	120

In order to find out if the number of times a student took the TOEFL was related to the TOEFL scores, the author ran a correlation analysis. Frequency analysis showed that thirteen percent of the participants only took the TOEFL test one time ( $n = 26$ ). Sixteen percent of the participants took the TOEFL test twice ( $n = 32$ ) whereas 22% of the participants took the TOEFL test three times ( $n = 44$ ). Twenty percent of the participants took the TOEFL test four times ( $n = 40$ ). Fifteen percent of the participants took the TOEFL test five times ( $n = 30$ ) whereas 14% took it six or more times ( $n = 29$ ). The number of participants that have taken the TOEFL specific numbers of times are shown in Figure 4.

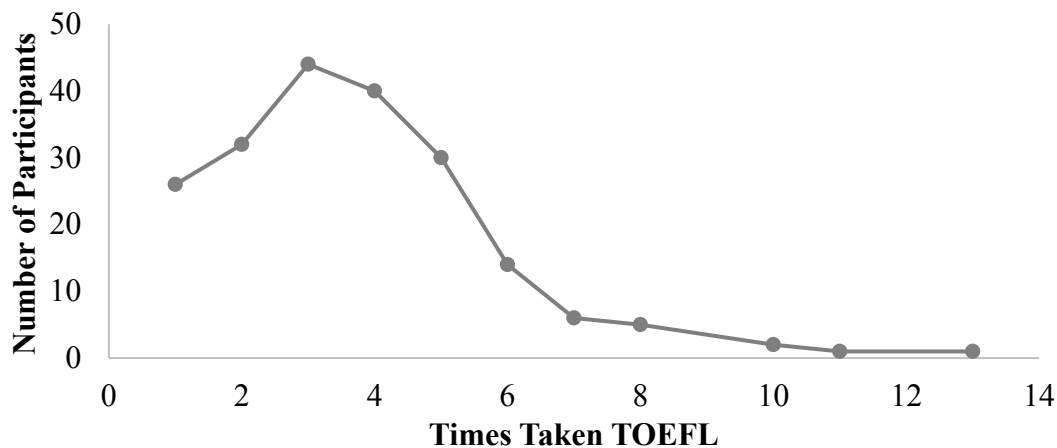


Figure 4. Times taken the TOEFL ( $n = 201$ ).

The relationship between the number of times the TOEFL was taken and participants' total TOEFL scores were investigated using the Pearson correlation analysis. There was no statistically significant correlation between the two variables,  $r(201) = .04, p > .05$ .

### Demographic Characteristics and TOEFL

Pearson correlation coefficient was used to examine which demographic variables relate to TOEFL scores. Some data were transformed from non-interval variables into dummy variables to run the correlation analysis. For example, Home City was coded to Tier 1 city = 1 vs. non-Tier 1 = 0 dummy variables; Institution was coded to UC = 1 vs. non-UC = 0 dummy variables; Major was coded to STEM=1 vs. non-STEM=0 dummy variables. Pearson correlation ( $n = 201$ ) results show that Home City, Institution, and Major were significantly correlated to TOEFL scores (see Table 5).

Table 5

#### *Pearson Linear Correlation, Demographic Characteristics and TOEFL*

Demographic Characteristics ( $n = 201$ )	$r$	$p$	Significant Result (GPA)
Gender	-0.040	0.570	No
Home City	0.015	0.031	Yes
Years Living in the U.S.	0.014	0.834	No
Year in Program	0.004	0.946	No
Education Level	0.026	0.070	No
Major	0.177	0.011	Yes
Institution	0.235	0.000	Yes

*Note.* All above responses are reported in descending order, meaning 1 = high confidence, 5 = low confidence. Therefore, all negative correlation coefficients imply a direct relationship with GPA.

### GPA

Among a total of 201 participants, the mean GPA was 3.43, the median GPA was 3.5, and the standard deviation was 0.41. In this sample, 167 or 83% of participants had a GPA above 3.0. More specifically, 44% ( $n = 90$ ) of participants had a GPA above 3.6 (see Figure 5).

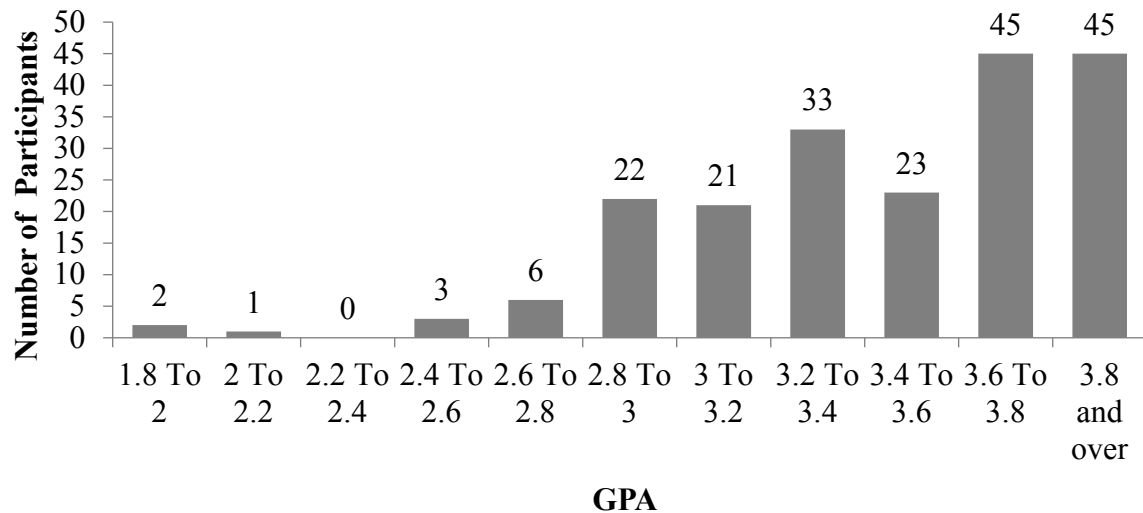


Figure 5. GPA ( $n = 201$ ).

### Quantitative Findings

Research Question 1 and 2 were addressed quantitatively using inferential statistics. Correlation analysis was used to find the relationship between total TOEFL scores and Chinese international students' GPA. Hierarchical Linear Modeling was used to investigate the factors associating with GPA.

#### Research Question 1

The first research question investigated the relationship between total TOEFL scores and Chinese international students' academic success as defined by GPA. The Pearson correlation coefficient computed showed a statistically significant relationship between total TOEFL scores and GPA. There was a moderate, positive correlation between the two variables,  $r(201) = .30, p < .001$ . A scatterplot summarizes the results (see Figure 6). The higher the TOEFL scores, the higher the GPA was. As this distribution indicates, it clusters on the middle.

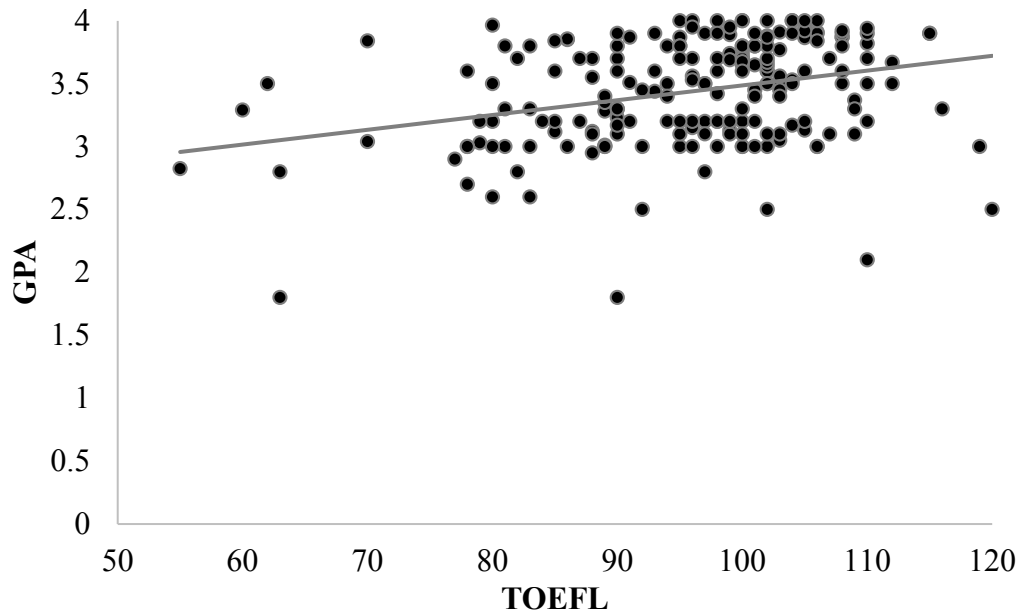


Figure 6. TOEFL and GPA scatterplot.

## Research Question 2

The second research question looked at other factors, input and environment, that impact Chinese international students' GPA independently from TOEFL. This question was addressed by a hierarchical regression analysis using three models as informed by IEO theory and previous research findings as described in Chapter 2. The first model investigated the impact of input factors (gender, home city, education level, years living in the U.S., previous learning experience, etc.). The second model looked at environment factors, such as study habits, self-confidence, and social network. The third model included the effect of the main predictor, the TOEFL, when controlling for input and environment factors.

## Demographic Factors

Prior to conducting a hierarchical linear regression, a Pearson correlation analysis was used to examine which demographic variables previously identified from theory relate to GPA showed a positive association with GPA. Data on these factors were transformed from non-interval variables into dummy variables to run the regression analysis. Specifically, Home City was coded to Tier 1 city = 1 vs. non-Tier 1 = 0 dummy variables; Institution was

coded to UC = 1 vs. non-UC = 0 dummy variables; Major was coded to STEM=1 vs. non-STEM=0 dummy variables. Pearson correlation ( $n = 201$ ) results showed that the factors, years living in the U.S., institution, and major, were significantly and positively correlated to GPA (see Table 6).

Table 6

*Pearson Linear Correlation, Demographic Characteristics and GPA*

Demographic Characteristics ( $n = 201$ )	$r$	$p$	Significant Result (GPA)
Gender	-.027	.700	No
Home City	.062	.375	No
Years Living in the U.S.	-.142	.043	Yes
Year in Program	.049	.487	No
Education Level	.124	.078	No
Major	.022	.001	Yes
Institution	-.051	.046	Yes
TOEFL Reading Score	.286	.000	Yes
TOEFL Listening Score	.217	.001	Yes
TOEFL Speaking Score	.154	.028	Yes
TOEFL Writing Score	.361	.000	Yes

*Note.* All above responses are reported in descending order, meaning 1= high confidence, 5 = low confidence. Therefore, all negative correlation coefficients imply a direct relationship with GPA.

Therefore, these input variables, years living in the U.S., institution, and major were used in the hierarchical regression model as predictors of GPA. Surprisingly, there was no statistically significant correlation between the previous learning experience and GPA (see Table 7).

Table 7

*Pearson Correlation Coefficient between Previous Learning Experience Questions and GPA*

Questions ( $n = 201$ )	$r$	$p$	Significant Result (GPA)
Q26. Classes taught in the U.S. are similar to those taught in my home country	-.092	.193	No
Q27. I am able to adapt to the teaching style of the U.S.	-.129	.067	No

*Note.* All above responses are reported in descending order, meaning 1 = high confidence, 5 = low confidence. Therefore, all negative correlation coefficients imply a direct relationship with GPA.

## Environment Factors

There were 13 Likert-style questions related to environment factors. The literature review in Chapter 2 revealed three factors that relate to GPA in previous research: self-confidence, study habits, and social network. The relationship between these factors and GPA was investigated through Pearson correlation analysis (see Table 8).

Results showed that there was a positive correlation between two questions about self-confidence and GPA, Question 18 (I feel confident about finishing my program), and Question 19 (I feel confident about earning a 3.0 GPA (or higher) at the time when I graduate). Because the Likert scale was negatively trending, the R-value is negative. Pearson correlation analysis showed a positive correlation between confidence and GPA,  $r(199) = -1.80, -.353, p < .05$ . These two questions were about confidence in their performance at college, and they will be used here as a proxy for self-confidence. Surprisingly, questions about confidence in their academic skills were not related to their GPA; thus, they were not used in the regression model.

Table 8

*Pearson Correlation Coefficient between Questions on Confidence and GPA*

Question ( $n = 201$ )	$r$	$p$	Significant Result (GPA)
Q18. I feel confident about finishing my program.	-.180	.010	Yes
Q19. I feel confident about earning a 3.0 GPA (or higher) at the time when I graduate.	-.353	<.001	Yes
Q20. I feel confident communicating with native-English speakers.	-.114	.106	No
Q21. I feel confident communicating with Chinese speakers.	-.131	.063	No
Q22. I feel confident speaking English.	.017	.804	No
Q23. I feel confident writing in English.	-.042	.550	No
Q24. I feel confident reading in English	.040	.571	No
Q25. I feel confident listening in English.	.084	.231	No
Q32. I believe that my English proficiency affects my academic performance.	-.034	.625	No

*Note.* All confidence responses are reported in descending order, meaning 1 = high confidence, 5 = low confidence. Therefore, all negative correlation coefficients imply a direct relationship with GPA.

Pearson correlation coefficient analysis ( $n = 201$ ) also reported that there was a correlation between Question 28 (My study habits are adequate to maintain good grades) and GPA (see Table 9). This question was used as a proxy for study habits. The other questions were exploring the impact of studying with English speakers versus Chinese speakers, but they were not associated with GPA.

Table 9

*Pearson Correlation Coefficient between Study Habits and Social Network Questions and GPA*

Questions ( $n = 201$ )	$r$	$p$	Significant Result (GPA)
Q28. My study habits are adequate to maintain good grades	-.222	.001	Yes
Q29. I prefer to study alone rather than in a group	-.095	.179	No
Q30. I study with students from my home country	-.069	.323	No
Q31. I study with students from my host country	-.006	.931	No

*Note.* All above responses are reported in descending order, meaning 1 = high confidence, 5 = low confidence. Therefore, all negative correlation coefficients imply a direct relationship with GPA.

The Linear Hierarchical Regression analysis was conducted using three models as informed by previous research and by the correlation analysis performed here. Model 1 investigated the relationship between input variables and GPA. Model 2 investigated the relationship between environment factors and GPA. Finally, Model 3 looked at the role of TOEFL in predicting variation on GPA.

The demographic (input) variables replicated previous findings as they all remained positively related to GPA, explaining 7.7% of the variance. The environment factors in Model 2 were also associated positively with GPA after controlling for input variables. The total variance explained by these two models together was 19.2%,  $F(5, 195) = 9.24, p < .001$ . The two environment factors explained an additional 11.5% of the variance in GPA in addition to the 7.7 % explained by the first model. After the first two models explained 19.2%, the total TOFEL score in Model 3 explained only 6.9% of the variance in GPA. The

total variance explained by the model, as a whole, was 23.8%,  $F(6, 194) = 11.41, p < .001$ .

In the final model, all six control measures were statistically significant, with total TOEFL recording the highest beta value ( $\beta = .278, p < .001$ ). Self-Confidence recorded the second-highest beta value ( $\beta = -.245, p < .001$ ). The students' major recorded the third-highest beta value ( $\beta = .170, p < .01$ ). Years living in the U.S. recorded the fourth beta value ( $\beta = -.166, p < .05$ ). Study Habit recorded the fifth beta value ( $\beta = -.151, p < .05$ ). Institution had the lowest beta value ( $\beta = -.145, p < .05$ ).

Table 10

*Summary of Hierarchical Regression Analysis for Variables Predicting GPA*

Model	Variable	$\beta$	$t$	$R^2$	$\Delta R^2$	Sig.
Model 1				0.077	0.077	0.001
	Years Living in the U.S.	-0.152	-2.20*			
	Institution	-0.079	-1.14*			
	Major	0.229	3.33**			
Model 2				0.192	0.115	<.001
	Years Living in the U.S.	-0.161	-2.44*			
	Institution	-0.08	-1.22*			
	Major	0.213	3.28**			
	Self-Confidence <sup>a</sup>	-0.253	-3.83**			
	Study Habit <sup>a</sup>	-0.188	-2.81**			
Model 3				0.238	0.069	<.001
	Years Living in the U.S.	-0.166	-2.61*			
	Institution	-0.145	-2.25*			
	Major	0.17	2.69**			
	Self-Confidence <sup>a</sup>	-0.245	-3.87***			
	Study Habit <sup>a</sup>	-0.151	-2.33*			
	Total TOEFL	0.278	4.26***			

Note.  $n = 201$ ; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

<sup>a</sup>All self-confidence and study habit responses are reported in descending order, meaning 1 = high confidence, 5 = low confidence. Therefore, all negative correlation coefficients imply a direct relationship with GPA.



## **Qualitative Findings**

Research Question 3 was addressed qualitatively using thematic analysis. A second coder who was trained by the researcher also coded the data. Peer debriefing and inter-coder reliability were used as validation procedures.

### **Research Question 3**

The factors that influence the experiences of Chinese international students' academic success in the U.S. from the students' perspectives were investigated through open-ended questions in the survey, and a follow-up interview with a subsample. Seven participants agreed to have in-person, semi-structured interviews to discuss in more depth the open-ended questions from the survey and add any relevant information they deemed important. The interview consisted of six closed-ended questions to elaborate on background information and four open-ended questions (see Appendix A).

### **Demographic Questions**

The demographic details of the subsample of participants were somewhat representative of the larger sample (see Table 11). The education level, GPA, and socioeconomic status are similar to the majority of the participants from the large sample; they are undergraduates, in the higher middle class, and have a GPA of 3.0 and above. The TOEFL scores, however, were somewhat different as half of the subsample scored lower than 80. Unlike the larger sample, most of the participants in this subsample were females.

Table 11

*Demographic Data Chart Showing Demographic Information of Interview Participants*

Participant	Gender	Years In Program	Education Level	TOEFL	GPA	SES	Confidence in Completing Program
#1	Male	3	Undergraduate	98	3.2	Upper Class	Yes
#2	Female	4	Undergraduate	89	3.0	Upper Middle Class	Yes
#3	Female	1	Undergraduate	79	3.0	Middle Class	No
#4	Female	3	Undergraduate	79	3.2	Upper Middle Class	Yes
#5	Female	3	Undergraduate	102	3.8	Upper Middle Class	Yes
#6	Female	2	Graduate	110	3.3	Middle Class	Yes
#7	Female	3	Undergraduate	60	3.5	Upper Middle Class	No

There were three constructs that were explored further through the interview.

### **Study Habits**

There were open-ended questions and when necessary prompts were used to elaborate on answers and investigate the frequency of study. The questions were: Tell me about your study habits? The prompts were: How many hours do you study per day? Where do you study? Alone or with others? Who do you receive study support from?

All seven interview participants answered that they preferred to study alone. Four participants answered that they did not receive study support or that they did not need study support. The library and the home were the two primary locations where participants studied.

Study hours varied from participant to participant. Table 12 shows information about interview participants' study habits.

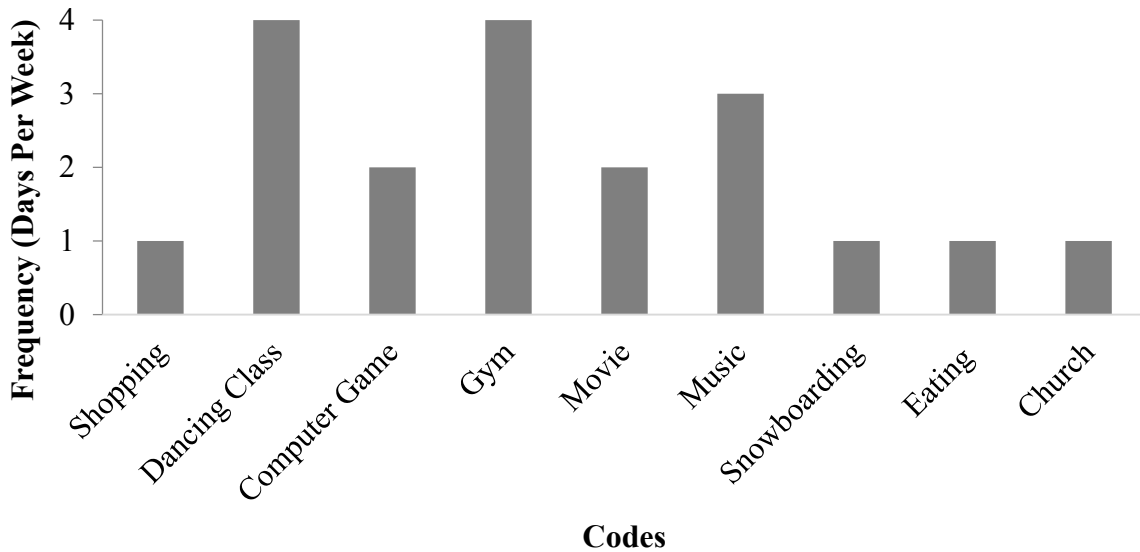
Table 12

*Data Chart Showing Interview Participants' Study Habits*

Participant	Daily Hours	Location	Study Group or Alone	Source of Support
#1	2	Friends' Dorm	Study alone, but also study with American friends	American friends
#2	1.5	Library	Study alone	None
#3	Depends on homework	Home, Library	Study alone, but sometimes prefer group	None
#4	Depends on homework	Library	Study alone	Writing Center, Tutor, Professor
#5	3+ Hours	Home, Library	Study alone	Writing Center
#6	3+ Hours	Home	Study alone	None
#7	1 Hour	Home	Study alone	Writing Center, Tutor, Chinese Friends

## Hobbies

The question asked participants about what their hobbies were: What are your hobbies? This question was closed-ended. The codes with the highest frequencies were physical activities (dancing class and gym) followed by music (see Figure 7). Hobbies that related with pleasure such as computer games, shopping, movies, did not come up as frequently as physical activities.



*Figure 7.* Bar chart showing the average frequency across all seven participants for number of days per week for each hobby.

### **Social Experiences with U.S. Students**

The open-ended questions were analyzed for themes, and the same process of coding was followed with each question. This procedure was validated through a pilot, and interrater reliability was established between the researcher and a second independent coder who was trained by the researcher. The researcher first coded all the transcripts, and developed themes for each open-ended question asked during the interview. Each answer was coded at the phrase level, and the themes were not exclusive, there could be more than one theme per answer. The themes that were similar were combined. The second coder was trained to code the data from the transcripts obtained from the pilot study once the phrases and themes were defined. When consensus was reached between the two coders in the pilot data, the data from the sub-sample was coded independently by the second coder. The second coder read and coded each transcript at a time. The inter-coder reliability was calculated after each transcript, and the average Cohen's kappa coefficient for all transcripts was 80%.

Disagreements between coders were resolved, first, by checking the independent codes, then, discussing and recording. If an agreement was reached the new agreed-upon code was used.

If an agreement was not reached in the second coding, then, the researcher decided on the code to be used.

The themes for these questions are presented below with the content analysis for each question. The questions were analyzed according to the IEO theory. The social experience of the participants with American locals was examined using the open-ended questions: Do you hang out with U.S. students? What did you feel and experience when hanging out with U.S. students? The themes for this question were: lack of confidence, brain filtering, stereotypes, cultural differences, and comfort zone. Figure 8 shows how themes were formed. For instance, lack of confidence was encompassed in the themes setback myself, keep silence in group projects, afraid to say jokes, etc.

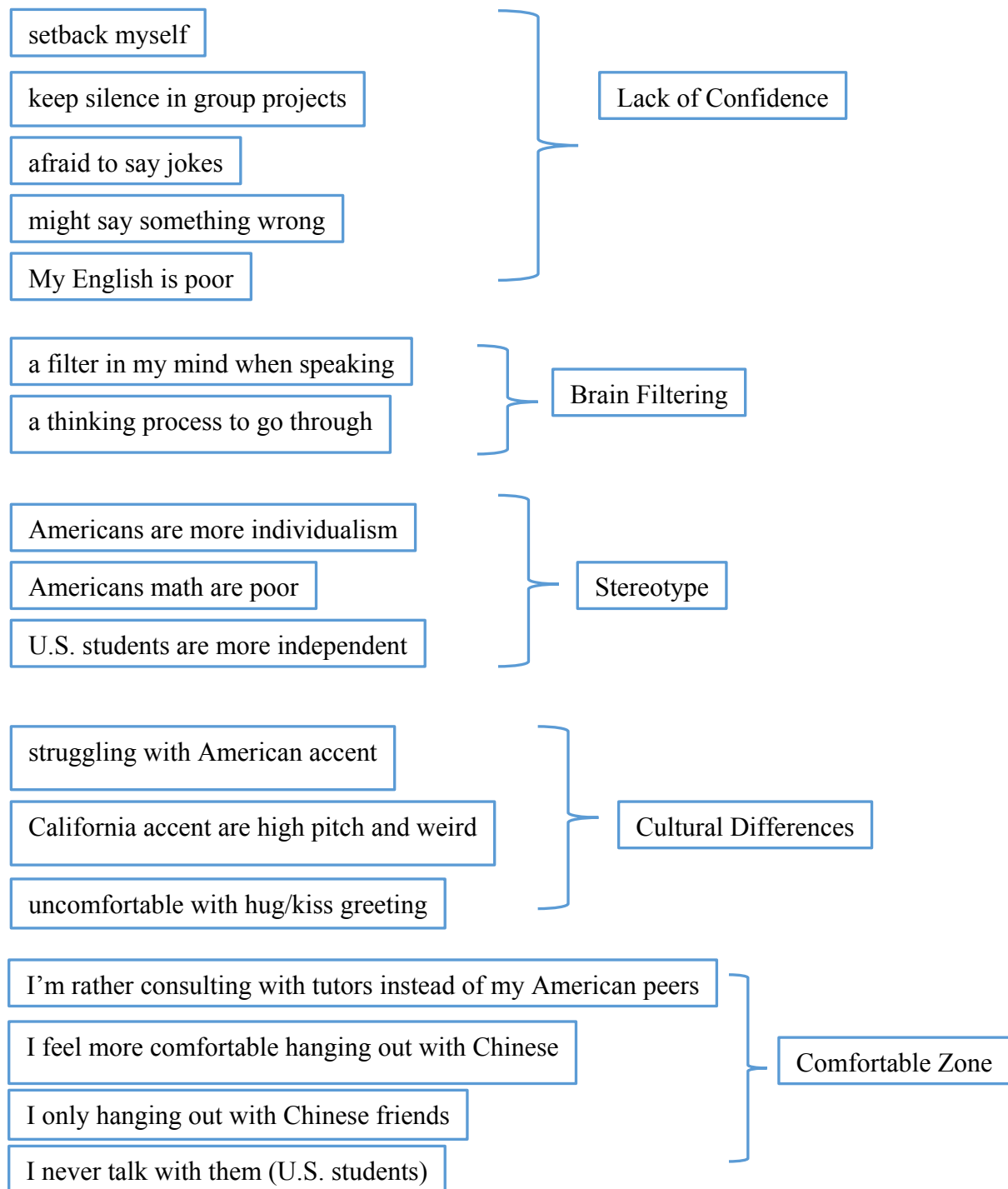


Figure 8. The figure shows how themes were formed.

## Previous Learning Experiences in China

The question asked to explore participants' previous learning experiences was: What are your previous learning experiences in the high schools (or universities) in China? Five themes were established. The themes were: lots of memorization and homework; entrance and final exams are important; passively receiving information; schools care about results; schools assign dormitories and classes.

## Differences in Schools Between the U.S. and China

Information about the differences was requested using the question: How are U.S. schools different from China?

Five themes emerged from the data: lots of academic writing; participation, quizzes, and class discussion are important; schools care about learning processes; actively participating; students' choices dormitories and class enrollment. Table 13 shows the sample responses from each participant.

Table 13

*Sample Responses from Participants about Previous Learning Experiences in China and Differences between China and the U.S.*

Participant	Previous Learning Experience in China	Differences Between the U.S. and China
#1	The Chinese way of learning is stricter. They tend to ignore your path and push you to prepare the final exam. Practice, so the students are good at study and memorization. People prepare a lot for the Zhongkao (High School Entrance Exam) and Gaokao (College Entrance Exam). Both exams you only have one chance to take unless people redo the last year of school. In China, you have to stay focused on all the classes to receive all the information. Otherwise, you will fail these courses.	SAT can be taken many times. In the U.S., missing one knowledge or one topic is OK, skipping a few classes is OK.

#2	In China, we have English class every day. But mostly we are just working on reading and writing.	In China, at school, we mainly study math, Chinese, English, and Science. But in America, we have a lot to choose from to study like art, like any sports. In China, we did not write any paper or essay, but in America, we need to write a lot of papers.
#3	What I need to do in China is just finish my final exam. Actually, homework is not necessary. Because if my final exam is very good, I don't need to do my homework.	So basically, in China, only the final grades are important, but in the U.S., everything counts into final grades.
#4	In China, in high school, everything is prepared by the teacher. Everything controlled from the school and teacher. They have a schedule for your class. Also, my high school is a strict high school. In my senior year, we can only go back home every other week. Very strict. Lots of homework and lots of classes. But college is like the U.S., and you have more spare time and freedom.	The college in China is like the U.S., and you have more spare time and freedom. In China, my roommate is my classmates, and we attend the same classes, too, but in the U.S., my roommate won't be my classmates. Also, in China, the school registers your course at the beginning of each semester. In the U.S., you need to do your registration.
#5	The high school in China is different than here. We are required to know nine subjects, including Chinese, math, and English as the main subjects. And then you have to take Biology, Physics, Chemistry, and so on. Chinese teachers, they prefer you to keep silence. You just need to stay in the classroom and show that you are listening.	In here (the U.S.), you can choose which subjects you want to take and then take the AP test. In the U.S., the professor expects you to join in the class like ask questions, or the professors feel really bored, and they do not want to teach the whole lecture like for three hours. They want you can ask some questions about their personal experience.
#6	There's a lot of memorization and more learning. So basically, go to the class, and you copy down notes. That the teacher is dictating so you copy, and you make sure that you learn it, and you go for the exams.	Here (the U.S.) is different in the sense that you are expected to really participate in class discussions. So, the learner is not passively receiving information but actively participating in creating his own knowledge.
#7	I think teachers and parents care more about the results, like the students' score.	American education care about the process. They (teachers) need students to participate in the class.

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## TOEFL Experiences

The first part of the series of questions on TOEFL experience that were asked to participants was non-open-ended questions: Did you attend TOEFL preparatory classes? How long did it take you to prepare for TOEFL? How many times have you taken the TOEFL? From their answers, it was observed that times taken to prepare for the TOEFL and the number of times the students have taken the TOEFL varied by participant. However, all participants attended TOEFL preparatory classes (see Table 14).

Table 14

### *Participants' TOEFL Preparation Information*

Participant	TOEFL preparation Time	Times Taken TOEFL	Attended Preparatory TOEFL?
#1	2 Years	3	Yes
#2	1-2 Years	1	Yes
#3	1 Year	7	Yes
#4	2-3 Years	5	Yes
#5	4 Months	3	Yes
#6	3 Months	1	Yes
#7	1 Year	1	Yes

The second part of the series of questions on TOEFL experiences was an open-ended question: How was your TOEFL experience? Four themes were established: helpful in academic words, long test hours, disturbed during tests, unhelpful in real conversation.

Table 15

*Sample Responses about TOEFL Experiences*

Positive	Neutral	Negative
I can still remember TOEFL prepared me to address the need for biology vocabulary, so it's really helped me in my biology class in high school. When I do labs, I know those vocabularies and the different meaning of those vocabularies. So, it's really helpful.	TOEFL writing is hard because writing is a combination of vocabulary and speaking skills. But it's easy if you know the formula. In China, we have Xindongfang and Xinhangdao (test preparation schools). We also have a formula, like a bottom. Each time, we just need to fill out new writing questions with the same formula.	I don't feel (TOEFL) is helpful because TOEFL including many academic words but I only study one major. Most words are not necessary. Many people from China they're TOEFL score is almost like 100. But when we are in the class (at the U.S. university), we are no different.
I found the (TOEFL) format was fairly easy and comprehensive.	TOEFL is more helpful in learning academic words, but in a real conversation no. Even TOEFL has a speaking test, but you know it's different. Because in China, the way the student prepared TOEFL is like our Chinese way of learning, which we remember something beforehand, not something that just came out.	I have to say like the actual test was in bad grade because everyone was packed in a small room. I think we're not working on the same parts at the same time. So, while someone was doing the speaking, I was doing the listening. Then you can hear the person in the background speaking, and it was really difficult to listen attentively. So. I think that was one thing that I didn't like about the test.

**English Proficiency and Academic Performance**

The open-ended question about English proficiency and academic performance that was asked was: Does English proficiency affect your academic performance? Two themes were established: core class and class needs lots of English. Table 16 shows the sample responses for the groups replying “yes” and “no” to this question.

Table 16

*Sample Response about English Proficiency and Academic Performance*

Yes	No
Yes. It affects a lot because I think a lot of core classes like theology and history, we need to have good English for understanding the book. But in some classes, like math, we don't need to have good English for understanding. In history class, we need a lot of English work too.	Not really. Because people here are nice, they are willing to help me. English is your second language, but I already can do it so well. Which means I actually have nothing to worry about. I am already better than people who speak only one language. If you say academically writing, yeah, because it's not my first language, but it doesn't really matter because I can work hard for it.
Yes. 100 percent yes. For example, if I received a report from my professor about my essay, and I only got 85. The first thing coming into my mind is why they took that 15 score off. Is that because of grammar error? Or I just cannot explain well because of the language problem, or because my English is different from the native speaker. That's the first thing that comes to my mind instead of did I miss something in the class.	No. But if my English is better, maybe I can get better grades.

The last question was: What do you see as being the most helpful to do well academically in the U.S.? Three themes have been established: communicate more with the U.S. students, participating in class discussions, and read the syllabus carefully.

**Factors Influencing Academic Experiences in the U.S.**

Figure 9 illustrated the theoretical model of learning experience derived from themes and adapted to IEO theory. In this figure, input refers to Chinese international students' previous learning experiences in China. These are the characteristics that international students bring with them when starting U.S. universities. Environment refers to their experiences in U.S. universities. Swing (2001) mentioned that outputs are the growth in a student's academic success after being exposed to the environment (Swing, 2001). To have academic growth, Chinese international students need to overcome both pedagogical and cultural gaps between the U.S and China. For example, U.S. education involves a lot of

writing academic essays. Students' grades not just based on the final exam score, but rather including students' participation, class discussions, quiz scores, and academic essays. To overcome the education differences, Chinese international students need to defeat both language barriers and cultural adjustment issues.

Table 17

*Theoretical Model of Learning Experience Derived from Themes and Adapted to IEO Theory*

Input	Environment	Output
Lots of memorization and homework	Lots of academic writing	Language Barrier, Cultural Adjustment
Entrance and final exams are important	Participation, quizzes, essays, and class discussion are important	Language Barrier, Cultural Adjustment
Passively receiving information (stay focused and keep silence)	Actively participating in creating his/her own knowledge	Cultural Adjustment
Schools care about results	Schools care about learning processes	Cultural Adjustment
Schools assign dormitories and classes	Students' choices dormitories, class enrollment (general education classes and more choices for electives)	Cultural Adjustment

### Summary

This chapter presented the major findings of this study, which investigated three overarching research questions. The intent of this research was to explore the relationship between TOEFL scores and Chinese international students' academic success (GPA), and factors associated with TOEFL scores and GPA. In addition, this study also explored factors influencing the experiences of Chinese international students' academic success in the U.S.

Analysis for the first question indicated that there was a moderate, positive correlation between TOEFL and GPA. Analysis for the second question indicated that, independently of TOEFL, self-confidence, study habits, major, intuition, and years living in the U.S. are associated with GPA. In addition, results for the qualitative interviews indicated that the

language barrier and cultural adjustment are the two main factors influencing Chinese international students' academic experience in the U.S.

## CHAPTER 5: DISCUSSION

In the previous chapter, the analysis and results of the three research questions guiding the current study were discussed. This chapter includes the discussions of the findings, the implications for practice, limitations, delimitations, recommendations for further research, and conclusions. This chapter serves two purposes. The first purpose is to provide additional insight and discussion about the findings. The second purpose is to present suggestions for further research.

### **Discussions of the Findings**

The purpose of this study was to investigate the relationship between TOEFL scores and Chinese international students' academic success as defined by GPA, and factors related to demographic (input) or environment differences that, independently from TOEFL, might be associated with GPA. The second purpose of this study was to investigate factors influencing Chinese international students' academic experiences in the U.S.

The quantitative findings using Pearson correlation analysis showed that there was a moderate, positive correlation between TOEFL and GPA. Pearson correlation analysis showed that major, institution, years living in the U.S., self-confidence, and belief in study habits are statistically significant factors that are independently associated with GPA. This relationship between environment factors and GPA might also be moderated by input factors such as institution, major and home city.

Contrary to previous findings (Breland et al., 2004; Educational Test Service, 2015), gender was not associated with GPA or TOEFL scores. Tier city was associated with TOEFL scores though not to GPA. These findings imply that access to quality of education in China was related to higher TOEFL scores, thus, a higher chance of admission to U.S. universities. On the other hand, students from lower tier cities did just as well as those from

higher tier cities, implying that once accepted, the home city tier did not have an effect on GPA.

In addition, Hierarchical Linear Modeling further revealed that demographic factors (major, institution, years living in the U.S.) explained 7.7% of variance in students' GPA. When controlling for demographic variables, environment variables (self-confidence, study habits) explained an additional 11.5%. Lastly when controlling for all other factors, TOEFL only explains 6.9% of the variation. These findings, as well as the association between Tier city and TOEFL, indicate that the relationship between TOEFL and GPA is also influenced by input and environment factors. It also seems that admission to U.S. universities shows a bottleneck effect, where students who do not have access to quality of education, like, living in a 3 or 4 Tier city are less likely to have the opportunity to attend U.S. universities.

The findings from the qualitative result showed that language barrier and cultural adjustment are the two main factors influencing Chinese international students' academic experiences in the U.S. Due to the difference in the education system between China, an eastern country and the U.S., a western country, international students from China need to overcome both pedagogical and cultural gaps and adapt to the teaching style in the U.S. (Burch, 2008; Huang & Garrett, 2015).

Students did not find sufficient opportunities to interact with American students. Challenges of language and cultural differences contributed to creating a niche of social support with other Chinese students. This might also be due to the large proportion of Chinese students in the two largest institutions represented in this sample. Chinese students in this sample, as opposed to the Moglen (2017) study, were strategic in drawing from the universities' resources, e.g., they were more likely to seek help from universities' tutors rather than relying solely on Chinese peers.

### **Implications for Practice**

There is a large international student population studying in the United States. However, only a few studies have investigated international students' academic experience, especially the academic success of Chinese international students, which represents a large proportion in major universities in the U.S. The findings of this study address some limitations of this scholarly gap; however, more research is needed. This study has implications for international student affairs officers, university admissions officers, and university administrators.

For international student affairs officers, this study offers insight into the factors that influence the experiences of Chinese international students' academic success, such as factors related to language barriers and cultural adjustment. The study also explored the difficulties Chinese international students commonly face in the U.S, such as, lack of confidence, keeping silence in group projects, fear of saying something wrong, or fear of telling jokes. These findings give international student affairs' officers insight into international students' lives, thus equipping them to better guide and support newcomers. Moreover, the study investigated international students' previous learning experiences in China and compared the differences between the education systems in China and the U.S., which would give us a better understanding of the different education systems. It may also inform educators in China about the pedagogical and cultural gaps between Chinese international students and their American peers studying in western universities. Some changes that will place Chinese students at a better position to succeed in U.S. classrooms are: (a) switching their classroom attitude from keeping silence and simply taking notes during classes to actively joining in class discussions; and (b) switching from repetition and excessive focus on final exams to preparation for writing a greater number of academic essays. The findings of this study not only explain why international students' prior learning strategies do not always work in the



western university environment but also provide possible suggestions to overcome pedagogical and cultural gaps. Finally, students who participated in the qualitative interviews reported that increased communication with U.S. students supports their academic performance. Universities in the U.S. should also adapt their classroom management to include more group work to promote more interactions between international and national students. This will benefit the national students as well as they will gain more exposure to cultural diversity as well as the academic knowledge that international students could contribute, especially in the area of mathematics and science.

This study also provides useful findings for university admissions officers and administrators' use. The findings showed that TOEFL should not be the only factor to look at in admission decisions for international students. The TOEFL only has a moderate correlation with GPA. Furthermore, other factors such as self-confidence, study habits, and years living in the U.S. are also related to international students' academic success. This study has also shown, through the qualitative analysis, that TOEFL scores could be increased by using strategies such as memorization of articles and formulas, which could contribute to GPA. Another result emerging from the qualitative interview analysis was that the TOEFL does not help international students in engaging in real conversations. If universities over-emphasize the importance of TOEFL scores, international students admitted may not have a consistently high score across individual components of the TOEFL, although the net score may be high. This means that a student may have a high level of writing and reading but low levels of speaking and listening. Additionally, focusing exclusively on TOEFL scores has negative implications related to diversity and social equity; most students who score high in TOEFL come from Tier cities 1 and 2 and tend to be of higher socioeconomic status.

### **Limitations**

There are a few limitations to this study. First, the sample of international students was drawn from California and a few specific universities using convenience and snowball sampling; therefore, the findings of this study cannot be generalized to other states. Second, each academic institution or department may have different grading standards; therefore, caution needs to be exercised in comparing GPAs of international students across different universities. Third, there are other ways to measure success, such as career placement after graduation which have not been taken into consideration in this study. Students who don't test well, in general, could still be successful as determined by other markers such as career preparation.

### **Delimitations**

The researcher chose to conduct this research in California as the state has a large international student body. Specific universities that were more accessible to the researcher were chosen. Hence, although the sample of participants for this study was not randomly selected and was drawn from a limited number of universities in California, the choice of universities maximized response rates. According to data obtained from the Open Doors information resource (2017), in the 2016-2017 school year, there were 1,078,822 international students in the United States, of which 156,879 were in California. Hence, California is the state which welcomed the most international students (Open Door, 2017). Furthermore, the target universities have diverse international student bodies, which allowed a diversity of perspectives to be collected to answer the research questions of this study better.

Each university's GPA grading system might be slightly different. However, GPA continues to be the criterion most commonly used to measure students' academic performance. Overall, the results of this study could be beneficial and useful to educators

who (a) are also in higher education in the state of California, (b) work in the international student affairs office or admission department of higher education institutions in California, or (c) work in higher education administration.

### **Recommendations for Further Research**

This study used convenience sampling to select the universities from which participants were recruited. Data was collected from a limited number of universities in California. The first recommendation for further research is thus to expand data collection from California to other states and universities. The second recommendation for further research is to collect data from a heterogeneous sample of international students, hence the sample would not only be limited to Chinese international students. Random sampling could be used to recruit international student participants. The third recommendation for further research is to track international students from the first year of their U.S. studies all the way to graduation. Although this may require a considerable time and financial investments, it would provide valuable findings as to the factors that contribute to the long-term academic success of international students. The current study only consists of a small number of qualitative participants. Therefore, the fourth recommendation is to carry out more qualitative interviews in future studies in this research area. The topics can be expanded to include research about the relationships between international students' adaptation and academic success, international students' self-confidence and academic success, and international students' study habits and academic success.

### **Conclusion**

The findings of this study have addressed some literature gaps. To date, only a few studies of TOEFL are available, and most of them were published by the Educational Testing Service; the current study has provided fresh independent research in this area with a set of insightful findings. In summation, the relationships between input and environment factors

towards GPA (output variable) are complicated and not equivalent. While TOEFL continues to be a relevant factor for predicting higher education GPA of Chinese international students in the U.S., there are other factors that play a significant role. Some Input and Environment factors influence GPA but not TOEFL. Some input and environment factors influence TOEFL but not GPA.

International students are extremely important to higher education financial planning because of the tuition dollars they bring into the U.S. At the same time, institutions need to serve the international students with equal or greater attention and resources to ensure their academic success. Institutions need to also include the benefit to institutional culture, international relations, and other non-direct financial advantages as part of the reason why they recruit and support international students. Although this study only investigated Chinese international students, and the findings cannot be generalized to states other than California, the author believes the findings and recommendations could benefit both U.S. and Chinese educators.

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## APPENDICES

### Appendix A

#### Qualitative Interview Questions

1. Please briefly introduce yourself, including family background.
2. What is your TOFEL score and current GPA?
3. Tell me about your study habits? Prompts: How many hours do you study per day?  
Where do you study? Alone or with others?
4. What are your hobbies?
5. Do you hang out with U.S students? What was your experience of hanging out with U.S. students?
6. Can you describe your school experience in the United States and how does it compare to previous school experiences in China?
7. Did you attend TOEFL preparatory classes? Prompts: How long did you prepare for the TOEFL? How many times have you taken the TOEFL?
8. How was your TOEFL exam experience?
9. Do you feel confident in completing your program?
10. What do you think is most helpful to do well academically in the U.S.?

## Appendix B

### Consent Form for Interviews

(AUDIO USE: INTERVIEW PARTICIPANTS USE ONLY)

The Relationship Between Chinese International Students' TOEFL Scores and Academic Success in Higher Education

This study is being conducted by Yuyang Yan under the supervision of the Doctor of Education program. This study has been approved by the Institutional Review Board, Concordia University Irvine, in Irvine, CA.

**PURPOSE:** The purpose of this study will be to discover the relationship between TOEFL scores and international students' academic performance. The additional purpose will be to explore factors that impact international students' TOEFL scores and academic performance.

**DESCRIPTION:** The interview is 30 minutes long with 10 open-ended questions. After participants read and sign the informed consent, the interview will begin.

**PARTICIPATION:** This is a voluntary study, refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation.

**CONFIDENTIALITY:** The interviews in this study will be confidential. All data will be stored on a password-protected computer. As part of this research project, we will be making an audiotape recording of you during your interview. We will only use the audiotape in the way that you agree to. In any use of this audiotape, your name would not be identified. If you do not initial any of the spaces below, the audiotape will be destroyed.

**RISKS:** There are no potential risks.

**BENEFITS:** Although there is no direct benefit to the participants, the study will benefit all international students and universities in the future, especially in the study of international student and academic success.

**RESULTS:** The result of this study can be obtained through the CUI Digital Repository.

**CONTACT:** If you have any questions, please contact [yuyang.yan@eagles.cui.edu](mailto:yuyang.yan@eagles.cui.edu).

The audiotape can be studied by the research team for use in the research project.

Please initial \_\_\_\_\_

I have read the above description and give my consent for the use of the audiotape as indicated above.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_

The extra copy of this consent form is for your record.

## Appendix C

### Consent Form for Surveys

#### (SURVEY PARTICIPANTS USE ONLY)

#### The Relationship Between Chinese International Students' TOEFL Scores and Academic Success in Higher Education

This study is being conducted by Yuyang Yan under the supervision of the Doctor of Education program. This study has been approved by the Institutional Review Board, Concordia University Irvine, in Irvine, CA.

**PURPOSE:** The purpose of this study will be to discover the relationship between TOEFL scores and international students' academic performance. The additional purpose will be to explore factors that impact international students' TOEFL scores and academic performance.

**DESCRIPTION:** The participant will receive an online survey and informed consent. After participants read and check YES at the end of informed consent states, he/she has read the information above and agree to participate in your study, and the survey will begin. The survey contains five sections and has 29 questions in total. The first three sections are short-answer questions. The fourth and fifth sections are Likert-style surveys. The survey can be done within 10 minutes.

**PARTICIPATION:** This is a voluntary study, refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits, to which the subject is otherwise entitled.

**ANONYMITY:** The surveys in this study will be anonymous. All the data will be stored on a password-protected computer.

**RISKS:** There are no potential risks.

**BENEFITS:** Although there is no direct benefit to the participants, the study will benefit all international students and universities in the future, especially in the study of international student and academic success.

**RESULTS:** The result of this study can be obtained through the CUI Digital Repository.

**CONTACT:** If you have any questions, please contact [yuyang.yan@eagles.cui.edu](mailto:yuyang.yan@eagles.cui.edu).

**CONFIRMATION STATEMENT:**

I have read the information above and agree to participate in your study.

- ☐ Yes
- ☐ No



## Section One: TOEFL (Short Answer Questions)

1. What is your highest TOFEL score?

2. What is your highest reading score?

3. What is your highest listening score?

4. What is your highest speaking score?

5. What is your highest writing score?

6. How many times do you have taken the TOEFL?

## Section Two: Education Background (Short Answer Questions)

7. Are you an undergraduate or graduate student?

8. What is your cumulative GPA?

9. In what year of study are you? (e.g. first year, second year, freshman, sophomore, junior, senior, etc.)

10. What is your major field of study?

11. How long have you been studying in the United States? (e.g. Years or Months)

12. At which institution are you currently enrolled?

13. How are you financing your tuition in the U.S. (Check all that apply)?

- ☐ Family
- ☐ Scholarship
- ☐ Loan
- ☐ Personal Savings
- ☐ Other Resources

### Section Three: Demographic Background

14. What is your gender? ☐ Female ☐ Male ☐ Other

15. Which city are you from in China?

16. Did you take the Gaokao (China's National College Entrance Examination)?

- ☐ Yes. What is your score?
- ☐ No.
- ☐ I decline to answer this question.

## Section Four: Likert-style Survey

	Completely Agree		Neutral	Completely Disagree	
17. I feel confident about finishing my program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I feel confident about earning a 3.0 (or higher) GPA at the time when I graduate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I feel confident communicating with native-English speakers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I feel confident communicating with Chinese speakers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I feel confident speaking English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I feel confident writing in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I feel confident reading in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I feel confident listening in English.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section Five: Likert-style Survey

	Completely Agree		Neutral	Completely Disagree	
23. Classes taught in the U.S. are similar to those taught in my home country.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I am able to adapt to the teaching style of the U.S.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. My study habits are adequate to maintain good grades.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I prefer to study alone rather than in a group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I receive study support from international students from my country.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I receive study support from U.S. students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I believe that my English proficiency affects my academic performance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix D

## IRB Approval



## INSTITUTIONAL REVIEW BOARD DECISION

☐ Exempt Review 45 CFR 46.101    ☒ Expedited Review 45 CFR 46.110    ☐ Full Board Review 45 CFR 46

Review Date	February 15, 2018
IRB#	3933
Title of Project	The Relationship Between TOEFL Score and Academic Success in Higher Education
Researcher/s	Yuyang Yan

☒ **APPROVED**

Effective duration of IRB Approval: February 15, 2018 to February 15, 2019

This application is approved as written.

Recommendations (not required for IRB approval): If you want to run multivariate analysis, you must ensure that the dependent variables are interval level - your likert scale questions are ordinal - to make them interval, please remove the labels for 2 and 4. The remaining labels for 1, 3, and 5 are acceptable.

**For Exempt Approved, Please Note:** *while your project is exempt from providing Informed Consent information to the IRB, your project must still obtain participants' informed consent.*

**For Expedited and Full Board Approved, Please Note:**

*a. The IRB's approval is only for the project protocol named above. Any changes are subject to review and approval by the IRB.*

*b. Any adverse events must be reported to the IRB.*

*c. An annual report or report upon completion is required for each project. If the project is to continue beyond the twelve month period, a request for continuation of approval should be made in writing. Any deviations from the approved protocol should be noted.*

☐ **NEEDS REVISION AND RESUBMISSION**

☐ **NOT APPROVED**

Printed Name IRB Reviewer Eugene P. Kim, Ph.D.

Signature of IRB Reviewer Kim, Eugene

Digitally signed by Kim, Eugene  
Date: 2018.02.15 12:52:18 -08'00'

## Appendix E

## NIH Certificate

