

DISSERTATION

THE RELATIONSHIP BETWEEN THE TEST OF ENGLISH AS A FOREIGN
LANGUAGE (TOEFL), THE INTERNATIONAL ENGLISH LANGUAGE
TESTING SYSTEM (IELTS) SCORES AND ACADEMIC SUCCESS OF
INTERNATIONAL MASTER'S STUDENTS

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ABSTRACT

THE RELATIONSHIP BETWEEN THE TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL), THE INTERNATIONAL ENGLISH LANGUAGE TESTING SYSTEM (IELTS) SCORES AND ACADEMIC SUCCESS OF INTERNATIONAL MASTER'S STUDENTS

The purpose of this study was to examine if the Test of English as a Foreign Language (TOEFL) and the International English Language Testing System (IELTS) are related to academic success defined by final cumulative grade point average (GPA). The data sample, from three Midwestern universities, was comprised of international graduate students who graduated within 2006-2011. The total number of students records utilized were 793 (35.7% were female and 65.3% were male).

The study did not find a significant difference between TOEFL (paper-based, computer-based, and internet-based) and IELTS scores in relation to academic success. Students tended to score higher on TOEFL iBT followed by TOEFL PBT. Indian and Taiwanese students performed better on TOEFL iBT and Chinese and Indian students performed better on the TOEFL PBT. A statistical significance was found among final cumulative GPA and college program of study in relation to TOEFL and IELTS scores.

Knowing more about the reasons behind international graduate students' academic success is a benefit to institutions. The findings of this study may help graduate offices in comprehensive Midwestern institutions, with the recruitment and retention of international students. The research may also assist in the evaluation of admission requirements.

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DEDICATION

In memory of Rey John Arcuino

Rey John has always motivated and inspired me to live life to its fullest. He has been my guardian angel and because of him, I strive to be a better person.

Mahal kita Rey John and I hope I make you proud.

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CHAPTER ONE: INTRODUCTION

Background

The hope of receiving an American education is a dream that many students around the world share. However, before that dream can become a reality, there are certain factors that must be considered. First, international students must have the financial means to support their academic goals. Second, they must have earned a grade point average (GPA) that meets the minimum GPA requirement for admission. Third, international students must decide whether or not they are ready to move away from family, friends, and their home country. Fourth, they must consider whether they have the language ability and academic focus to be successful students in the United States. Finally, they must take the necessary standardized tests and receive a score that meets admission requirements. This research project was concerned with the last factor.

According to Gifford (1989) those who speak a first language other than English or use a vernacular variety of English experience problems with the vocabulary and linguistical structure of standard English. Phillips (2006) explained that students perform poorly because of the intricate English used on certain exams and the students' lack of comprehension. Furthermore, it can be challenging at times for non-native speakers to interpret the true meaning of questions from English to their native language.

The best tool to predict and measure international student academic success and graduation are continually researched. Literature comparing whether the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) scores were a better predictor of language proficiency were scarce. Studies comparing English proficiency scores to academic success among international graduate students studying at different universities were few. Lastly, research comparing the differences in admission

requirements of Midwestern institutions in relation to academic success had not been done. For these reasons a study investigating the relationship between English language proficiency tests and other factors that may influence academic success among international graduate students in Midwestern universities was needed.

International Student Enrollment

International students' presence benefits the United States in several ways. According to Tomkovick and Al-Khatib (1996) because international students were academically well prepared they positively contributed to the academic standards of educational institutions. International students also contributed to the campus' cultural diversity with their ethnic and cultural traditions and experiences. According to Marginson (2006) American universities did not have to change much of their curriculum or atmosphere to sustain interest among international students. International students were drawn to study in the U.S. and were transformed by the U.S. educational experience.

Some educational institutions experience pressure to diversify their student population; therefore, admitting international students who meet admission criteria can assist in this goal. Borjas (2004) examined the growth in international students studying in the United States and how this affected enrollment numbers in graduate programs for domestic students. The study found a strong negative correlation (coefficient $-.418$) between enrollment numbers of graduate international students and domestic Caucasian men. Especially at the more elite colleges and universities, high international student numbers restricted opportunities for domestic White men.

Lee, Maldonado-Maldonado, and Rhoades (2006) discussed the attention international student enrollment had received since 9/11. Discussions about national security policies which were directed toward international students encompass institutions of higher education since they

played an active role in admitting international students. Alberts (2007) researched the shifting patterns in international student enrollment. The author suggested that other prospects available in one's home country as well as other English speaking countries, contribute to the decrease in international student enrollment.

According to the Open Doors 2012 report, an increase of 5.7% brought the total number of international students during the 2011/12 academic year to 764,495. This number was a record high for international students studying in the United States. Results from the International Student Enrollment Survey in 2010 indicated that 51.9% of all responding institutions had an increase in their international student population. Additionally, 24.4% said there was a decline while 23.7% stated their enrollment numbers remained the same. In 2009, 45% stated there was an increase, 29% noticed a decline, and 26% had similar enrollment numbers.

Although some research suggested possible causes, exact reasons for why international student enrollment numbers fluctuated in a given year did not exist. Nonetheless, universities and colleges continued to recruit international students. Habu (2000) stated that academic institutions compete to recruit international students to bring in revenue. With changing times it was difficult to predict how enrollment numbers would be affected. Doty and Beverly (2008) reported that the inflating expenses to recruit, sustain, plus instruct foreign students, increased the budget constraints on institutional, state, and federal levels. Despite this reality educational institutions across the nation still did their best to stay competitive in the international education market for cultural and financial reasons.

Academic Success/Achievement/Performance

Researchers' term for academic success has varied. Some researchers referred to this concept as academic achievement or academic performance. Tanchareonrat (1988) defined

academic success as cumulative GPA in the first two semesters. Saisuphaluck (1997) defined academic success as final cumulative GPA and degree completion. Research further examined the factors which influenced academic success among international students taking courses in a language, English, that was not their mother tongue. Chemers, Hu, and Garcia (2001) found that academic self-efficacy as well as optimism played a role in academic success. Bouffard, Boisvert, Vezeau, and Larouche (1995) studied the effects of goal orientation and self-regulatory processes. The way personality types influenced academic success was examined by Chamorro-Premuzic and Furnham (2003). Blanton, Buunk, Gibbins, and Kuyper (1999) researched the effect of social interaction with peers in relation to academic success.

There are several studies that have also been done that took into consideration students' demographic attributes, as well as other external factors and how they related to academic success. For example, Richardson (1995) and Trueman and Hartley (1996) examined the relationship of age. University choice (Bratti, 2001) and proficiency in the English language (Feast, 2002) have also been studied. Park and Kerr (1990), Hoschl and Kozeny (1997), and McKenzie and Schweitzer (2001) have all conducted studies about prior GPA influence on predicting academic success. Duff, Boyle, Dunleavy, and Ferguson (2004) examined the connection between academic performance, learning approach, and personality.

Graham (1987) discussed why there were some challenges when trying to determine if there was a relationship with specific factors and academic success. The author explained:

There are a number of problems with both the design and interpretation of such studies, including (a) the criterion for judging academic success, (b) the validity of measure of English proficiency, (c) the interpretation of any relationships found, and (d) the large number of uncontrolled variables involved in academic success. (p. 506)

The above points did not negate the importance of English proficiency correlation to academic success. Previous research had shown that this relationship continued to be complicated and ambiguous.

English Language Proficiency Tests

In order for an international student to be granted admission into an educational institution, the student must have the necessary English language proficiency score that meets the minimum requirements. There are several English language proficiency tests used nationwide; however, the Test of English as a Foreign Language (TOEFL) and the International Language Testing System (IELTS) are the two tests which are accepted by the participating institutions in this study. For that reason this study focuses on the TOEFL and IELTS.

The TOEFL was developed in 1963 as an instrument to assess English language proficiency. The TOEFL was created by the Education Testing Service (ETS), a nonprofit organization that focused on developing a language assessment tool that would be used and recognized worldwide. Over 8,500 agencies and educational institutions recognize TOEFL scores in over 130 countries (<http://www.ets.org/toefl>).

The IELTS was developed and administered by the British Council, the University of Cambridge Local Examinations Syndicate and the International Development Program of Australian universities and colleges. The IELTS is administered in over 135 countries and the scores are accepted by over 7,000 educational institutions (www.ielts.org).

Since either the TOEFL or IELTS score is required when evaluating an international student's application for admission, it is important to remain knowledgeable about the similarities and differences of both tests. Additionally, being aware of the test structure, scores,

and availability of testing centers in each country is useful information when recruiting internationally.

The range of TOEFL internet-based (TOEFL iBT) and IELTS scores do not use the same numerical system. On the following page, Table 1 summarizes and compares some of the TOEFL iBT and IELTS total scores.

Table 1.

TOEFL iBT and IELTS Total Scores Comparison (ETS TOEFL)

TOEFL iBT	IELTS
35	5.0
46	5.5
60	6.0
79	6.5
94	7.0
102	7.5
110	8.0
115	8.5

Statement of Research Problem

Even though research exists regarding international students' academic success in relation to English language proficiency tests, continual examination and up-to-date research of language proficiency tests benefit professionals in the field. Additional research comparing TOEFL and IELTS scores to academic success at the graduate level contributes to the current knowledge base. Furthermore, comparison information of the differences in admission criteria among colleges and universities in the Midwest has yet to be done. Investigating the relationship between English language proficiency tests and influencing factors of academic success among Midwestern international graduate students is needed.

Significance of Study

The results of this study may provide useful information for institutions that have an international graduate student population. Knowing more about the reasons behind international graduate students' academic success is a benefit to these institutions. The findings of this study may help graduate offices in comprehensive Midwestern institutions, with the recruitment and retention of international students. The research may also assist in the evaluation of admission requirements.

The practical significance and motivation for this study was to contribute to the limited research comparing the TOEFL and IELTS scores. The participating institutions use both of these English language proficiency scores and these findings could contribute to the institutions by providing a better understanding of the criteria under which students are admitted. Because international students pay out-of-state tuition, investing in strategies to recruit and retain them provides an economic incentive for studies such as this one. Trends or information found in the study could benefit the graduate offices in devising strategic plans for recruitment, retention, and internationalization.

Purpose of the Study

Although research has been conducted to determine if English language proficiency tests are valid predictors of academic success, the results vary from research study to research study. The purpose of this study was to examine whether or not the TOEFL and IELTS are related to academic success, which is defined by final cumulative GPA at graduation. The study was intended to complement the body of knowledge examining the relationship of the TOEFL and IELTS scores to academic success. This study also investigated the relationship between English language proficiency tests, final cumulative GPA, gender, age, and college programs of study. In

testing these variables' connection to academic success among international graduate students at three Midwestern universities, the study sought to examine these variables and if they may influence an international student's academic success.

In 2011/12 there were 764,495 international students enrolled in higher educational institutions in the United States (Open Doors, 2012). It is important to maintain comprehensive knowledge about these students who make up a significant number of the U.S.'s student population. Attracting students to a university in the middle of the United States is not always easy but publicizing factors such as quality of education and degree offerings for an affordable price, makes small to medium sized Midwestern universities competitive with other educational institutions nationwide. Because the location of these institutions is distant to metropolitan areas, the perception that they may lack access to American artistic and entertainment culture is heightened, forcing these institutions to invent methods to recruit and retain international students.

Research Questions

- 1) Compare the differences between the TOEFL and IELTS scores, and academic success defined by final cumulative GPA at graduation or academic dismissal.
- 2) What is the correlation between TOEFL and IELTS scores and academic success defined by final cumulative GPA at graduation or academic dismissal?
- 3) Comparing those international students who graduated vs. those who did not graduate, is there a significant difference in scores between those who took the TOEFL?
- 4) Comparing those international students who graduated vs. those who did not graduate, is there a significant difference in scores between those who took the IELTS?

- 5) Which measure, the TOEFL or the IELTS, is the better predictor of academic success defined by final cumulative GPA at graduation or academic dismissal?
- 6) Are there differences in English language proficiency scores among selected international graduate students from different countries?
- 7) Are there associations between academic admission criteria (TOEFL, IELTS, and undergraduate GPA) and international graduate students' academic success rates when compared among these Midwestern universities?
- 8) What are the best predictors of academic success at three different Midwestern universities based upon TOEFL and IELTS score and GPA?

These were the original 8 questions initially included within the accepted proposal.

However, since the researcher was not given all the data originally requested from the three institutions, the questions were altered on the recommendation of the advisor and methodologist to the following:

- 1) What is the correlation between the TOEFL and IELTS scores on academic success defined by final cumulative GPA at graduation?
 - a. What is the correlation between TOEFL iBT and final cumulative GPA at graduation?
 - b. What is the correlation between TOEFL CBT and final cumulative GPA at graduation?
 - c. What is the correlation between TOEFL PBT and final cumulative GPA at graduation?
 - d. What is the correlation between IELTS and final cumulative GPA at graduation?

- 2) What are the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective? (explain the strongest and weakest correlations)
- 3) Are there differences between students from India, China, and Taiwan on their TOEFL and IELTS scores?
 - a. What are the differences between India, China, and Taiwan on TOEFL iBT scores?
 - b. What are the differences between India, China, and Taiwan on TOEFL CBT scores?
 - c. What are the differences between India, China, and Taiwan on TOEFL PBT scores?
 - d. What are the differences between India, China, and Taiwan on IELTS scores?
- 4) Is there a combination of TOEFL or IELTS scores, gender, and age that predict final cumulative GPA at graduation?
 - a. Is there a combination of TOEFL iBT, gender and age that predict final GPA?
 - b. Is there a combination of TOEFL CBT, gender and age that predict final GPA?
 - c. Is there a combination of TOEFL PBT, gender and age that predict final GPA?
 - d. Is there a combination of IELTS, gender and age that predict final GPA?
- 5) Are there differences among college programs of study on the TOEFL and IELTS scores and academic success defined by final cumulative grade point average at graduation?
 - a. Is there a difference between college programs of study on TOEFL iBT?
 - b. Is there a difference between college programs of study on TOEFL CBT?
 - c. Is there a difference between college programs of study on TOEFL PBT?

d. Is there a difference between college programs of study on IELTS?

Definitions

- 1) Graduation: successful completion of the master's degree in the program of study and graduated
- 2) Final cumulative grade point average (GPA): GPA at time of graduation
- 3) Academic success: final cumulative GPA at graduation
- 4) Test of English as a Foreign Language (TOEFL): English language proficiency test
- 5) International English Language Testing System (IELTS): English language proficiency test
- 6) Program of study: the individuals major area of study
- 7) College programs of study: the colleges (business, technology, education, and arts and sciences) that the academic program of study fall within
- 8) International graduate student: a student who is not a citizen of the United States, studying at the master's level, and holds an F-1 or J-1 student visa
- 9) Degree seeking: planning to attain a master's degree in program of study
- 10) Exchange student: a student who is not a citizen of the United States, holds a J-1 visa, and is non-degree seeking

Delimitations

This study was delimited to international graduate students from three Midwestern universities. These universities were referred to as University A, B, and C. Each institution was a state operated, comprehensive university located in the Midwestern United States. The data utilized for this study were accessed from each of the institution's graduate school's student records. Each institutions willingness to participate, as well as their comparable size were

reasons behind using these three institutions in the study. Contacts with these universities were established through working relationships. The researcher approached representatives from these particular institutions and asked if they would be willing to partake in this study.

For this study, degree seeking international students who completed a master's degree from one of the participating institutions between Fall 2006 and Fall 2011 made up the sample. Data starting from Fall 2004 were attained to ensure that all necessary variables were accounted for among international graduate students who graduated in Fall 2006. To ensure a graduation date between Fall 2006 and Fall 2011, the results of this study only reflected the international graduate student population who were enrolled between Fall 2004 and Fall 2010 at one of the three institutions.

The researcher decided to delimit the study to international graduate students at three Midwestern institutions who were enrolled in a master's program between 2006 and 2011. The TOEFL and IELTS scores were the test scores utilized, although there were other English language proficiency tests used among educational institutions nationwide. Only the international students, whose cut off scores met the minimum admission requirements, were included in this study. Exchange students were not included in the participant pool because they were not degree seeking students. All participants were non-native English speakers.

Limitations

This study was limited by the quality of data obtained from the three Midwestern institutions. The quality and consistency of data received from each institution were out of the researcher's control, and it was assumed the information was correct and accurate.

The data did not apply to international graduate students at the doctoral level and the results may not have any relation to international undergraduate students. Furthermore, the data

did not apply to students who studied at community colleges or other types of institutions. Only students at state institutions were used for this study; therefore, the results may only reflect those that studied at a comprehensive (master's level) Midwestern type of institution.

Researcher's Perspective

The universities were chosen based on contacts developed through the researcher's working relationship and based on previous knowledge the researcher had about each institutions recruiting strategies and internationalization efforts. The focus of this study was also chosen due to the researcher's personal interest and career in the field of international education. The researcher is a first generation Filipino, whose interest in other parts of the world started from the first visit to the Philippines to see her extended family. From childhood to the present, continued interested in other cultures and international exploration has led the researcher to visit nearly 50 countries.

In 1999-2001 the researcher served as a Teaching English as a Foreign Language (TEFL) Volunteer with the Peace Corps in Lenger, Kazakhstan. After that the researcher spent a few years teaching English overseas; one year in Japan, one and half years in Thailand, and two years in Poland while working on a masters in education. The researcher then moved to Kyrgyzstan for two years, to work for a nonprofit organization based out of the United States. The job entailed managing fully funded, study abroad opportunities for Central Asian students to study in the United States at the undergraduate and graduate levels for one academic year.

After several years overseas, the researcher returned to the United States to pursue a doctorate in education and human resource studies. Currently, the researcher works as the Interim Director of an International Office at a Midwestern institution but started off as the

Associate Director. The researcher was also employed for one year at the community college level working in the international student office.

Throughout the researcher's family upbringing and overseas experiences, education was highly valued. This is why the researcher works in the field of international education, assists in the recruitment and retention of international students, and supports international students in achieving their educational endeavors. Throughout these experiences, assessing current practices and improving recruitment and internationalization efforts was a constant challenge. The researcher believes this study can add to the research and understanding about language proficiency tests and academic success. Educational institutions across the nation may be able to benefit from the findings and assess their individual admission and recruitment strategies related to international students.

Once accepted into this PhD program, the researcher knew the dissertation topic would be related to international students. After receiving the job as Associate Director of International Programs and Services at one of the participating institutions, the former dean of Graduate and Continuing Studies inquired about the researcher's dissertation topic. The dean stated it was of interest to their office to research the relationship between English language proficiency scores and academic success; however, they did not have the time. Therefore, if at any time the researcher would need data of international graduate students in relation to this topic, their office would be able to assist. The more the researcher thought about this topic in relation to the researcher's current profession, the connection was evident and its importance to international education. As a result, the researcher decided to explore this topic and sought out other universities that would be interested in partaking in the study.

A quantitative, post-positivist methodology was chosen for this study. Exploring the relationships between international graduate students' language proficiency scores and academic success was of interest to the participating graduate school offices and deemed an appropriate comparative study to pursue.

CHAPTER TWO: LITERATURE REVIEW

Introduction

Research had shown several studies related to academic success among international students. Each study utilized specific variables to find relationships with academic success. Generally, these variables consisted of standardized test scores such as the Test of English as a Foreign Language (TOEFL) (Hwang & Dizney, 1970; Person, 2002), the International English Language Testing System (IELTS) (Kerstjens & Nery, 2000; Feast, 2002), the Graduate Record Examination (GRE) (Wilson, 1979; Basturk, 1999; Kuncel, Hezlett, & Ones, 2001; Feeley, Williams, & Wise, 2005), and the Graduate Management Admission Test (GMAT) (Powers, 1980; Wilson, 1985; Koys, 2005). Other studies had taken into consideration the effect of cognitive plus non-cognitive characteristics in academic success (Tanchareonrat, 1988; Hu, 1991; Sanford, 2009). Some studies defined academic success as first year grade point average (GPA) (Wilson 1986), while others stated that final cumulative GPA and degree completion indicated academic success (Saisuphaluck, 1997).

This literature review explains various studies that have researched academic success among international students. This review also describes the evolution and format of the English language proficiency tests: the TOEFL and IELTS. Finally it explores the research conducted on the TOEFL and IELTS in relation to academic success.

Non-Academic Factors Related to Academic Success

There have been studies that examined the non-academic factors related to academic success. Richardson (1995) found that mature and traditional entry age students' performance was approximately at the same level. Trueman and Hartley (1996) found that older students as well as college aged female students possess better time management skills in comparison to

college aged male and younger students. In 2001, Bratti researched the influence of university choice and found that specific A-levels type and score play a significant role in how a student performs in their degree. Chamorro-Premuzic and Furnham (2003) found that students who were conscientious introverts did better than other personality types. In 1999, Blanton, Buunk, Gibbins, and Kuyper researched the effect of comparison and comparative evaluation with peers in relation to academic success. Results revealed upward comparison did have long-term benefits. Another important non-academic factor that should be noted and may influence academic success is cultural.

Individualistic vs. Collectivist Cultures

Al-Zahrani and Kaplowitz (1993) compared American and Saudi attributional biases. When testing for individualism versus collectivism, the results revealed that Saudis were more allocentric when compared to Americans ($t(222.6) = 7.91; p < .001$). The study found Americans created more internal attributions to positive outcomes. On the other hand, Saudis presented more external attributions towards positive outcomes and internal attributions towards the out group's negative outcomes.

VonDras (2005) examined the relationship between individualistic vs. collectivistic attitudes and supposed learning barriers and self-efficacy. This study investigated how or if these factors affected course performance. Associations between learning barriers and self-efficacy with individualism-collectivism were found. Results suggested that personal views on individualism versus collectivism impacted social thoughts and conduct which support academic achievement.

Literature related to individualistic vs. collectivist cultures and international students are important to this study. Learning about some of the studies and background behind certain

cultures' beliefs and values may help in understanding the non-academic factors related to academic success.

In Group vs. Out Group

Church (1982) reviewed the literature related to foreign students' adjustment to their new host culture. Culture shock was considered to be a regular part of cultural anxiety which might involve stress and irritability as well as a desire to be in a place that felt more at home and comfortable. Barna (1994) stated that the six intercultural communication stumbling blocks were: 1) assumption of similarities, 2) language differences, 3) nonverbal misinterpretations, 4) preconceptions and stereotypes, 5) tendency to evaluate, and 6) high anxiety. The author explained that recognition of these stumbling blocks will help international students to evade them. Although this is not a simple task, becoming competent in intercultural communication is critical.

Brewer (1979) stated that intergroup competition was a result of the partiality in perception and attitude that reflected favoritism towards members of one's own group. Solidarity among the in-group members was protected, therefore excusing the views towards members of the out-group as outcasts.

Schmitt, Spears, and Branscombe (2003) explored international students' experiences of rejection within their host country and how it is associated to a feeling of identification with fellow international students. The study predicted that feeling discrimination from the host culture would be harmful to an international student's frame of mind. Findings revealed that international students created an original and different group identity on the basis of dissimilarity from the mainstream culture, not due to a specific race.

Literature related to in group vs. out group in relation to international students is important to this study. Gaining additional knowledge about some of the variables related to this topic can assist in understanding other non-academic factors related to academic success.

Academic Success/Achievement/Performance

Several studies had been done to investigate the factors which influenced academic success/achievement/performance. Bouffard, Boisvert, Vezeau, and Larouche (1995) studied the effects of goal orientation and self-regulatory processes. The way personality types influenced academic success was examined by Chamorro-Premuzic and Furnham (2003). Blanton, Buunk, Gibbins, and Kuyper (1999) researched the effect of social interaction with peers in relation to academic success. Richardson (1995) and Trueman and Hartley (1996) examined the relationship of age while Bratti (2001) researched about university choice. Park and Kerr (1990), Hoschl and Kozeny (1997), and McKenzie and Schweitzer (2001) have all conducted studies about prior GPA's influence on predicting academic success.

Academic expectations, stress, health, adjustment and challenge-threat evaluations, and their relationship to academic performance were examined by Chemers, Hu, and Garcia (2001). There was a significant (.08, $p < .01$) finding on self-efficacy and optimism (.17, $p < .01$) to academic performance. The authors found that academic self-efficacy as well as optimism played a role in academic success.

Duff, Boyle, Dunleavy, and Ferguson (2004) examined the connection between academic performance, learning approach, and personality. Deep approach (alpha coefficient = 0.81) and strategic approach (alpha coefficient = 0.82) had a positive association with academic performance, while surface approach (alpha coefficient = 0.73) was found to have a negative relationship to academic performance. The strongest association among personality factors was

between conscientiousness and academic success ($r = 0.14$). Overall there was no statistical significance ($p < 0.05$) found between the Big Five personality factors, learning approaches and academic performance.

Students' demographic attributes and how they were related to academic success/achievement/performance had also been taken into consideration. Although these studies were not directly related to international students, broad indication about previous studies connected to academic success provided more general information about available literature related to this topic.

Academic Success among International Students

South (1992) investigated whether participation in an English as a Second Language (ESL) course would predict academic success. Freshmen and sophomore GPAs and scores from ESL exams were correlated with demographic attributes. Findings determined by correlating ESL scores and GPAs indicated strong possibility of academic success for two groups: (1) ESL students with at least 12 ESL classes kept their GPAs consistent; and (2) ESL students with a strong correlation between ESL and academic GPA were more likely to do well in college.

Lee and Greene (2007) investigated the relationship of placement test scores and academic success with international graduate students. Academic success was defined as performance with GPA, faculty evaluations, and self- assessments done by the students. The Computerized Enhanced ESL Placement Test (CEEPT), an institutional ESL placement test, scores were used in this study. Based off the faculty questionnaires, there was no significant correlation with the CEEPT and content course performance ratings from the faculty members ($r = .14$, $p > .05$). On the other hand, there was a significant correlation between first semester GPA and the CEEPT. According to the self assessments from the students, CEEPT scores and course

performance were significant ($r = .34$). But no significance was found between first semester GPA and CEEPT scores ($r = .22$). The majority of students perceived that academic success plus prior background knowledge were the most important for academic success, not the ability to speak English.

Andrade's (2006) report reviewed literature that focused on the factors that influenced academic achievement and adjustment among international students. According to the summary, culture plus English language proficiency contributed to the challenges international students faced with adjustment. When it came to academic achievement language proficiency, educational background plus academic skills were influences.

Grayson and Stowe (2005) identified problems domestic and international students had in relation to language problems and academic success. From the data, it was seen that students who were second language speakers of English (no matter whether international or domestic) faced challenges academically. Based off of the open ended questions, 40% of ESL students found communication in English as one of the most difficult academic adjustment problems (international English speaking: 9%; domestic ESL: 23%; domestic English speaking: 13%). It was harder for these students to communicate with their peers, fully read course material, completely understand course lectures, and properly write reports.

Grayson (2008) conducted a study on both international and domestic students. The author investigated the relationship of a sense of coherence (SOC) to academic achievement. The author also took into consideration whether the student lived on campus or commuted. In comparison to others, commuter students that used English as their first language had a slightly higher SOC (.09) when compared to others. Although the high school grades among domestic

students were lower (-.13) than international students, GPAs of domestic students were slightly higher (.09) in comparison to international students.

The TOEFL

The Education Testing Service (ETS) is a nonprofit organization focused on design, assessment, and research to provide impartiality in educational evaluations worldwide. One of the educational assessments developed by ETS was the TOEFL. The following was from the TOEFL Test and Score Manual (Educational Testing Service [ETS], 1990):

The TOEFL was developed in 1963 to test the English-language proficiency of those wanting to study at colleges and universities in the United States. The TOEFL consists of the following sections: (1) listening comprehension; (2) structure and written expression; and (3) vocabulary and reading comprehension. A direct assessment of writing proficiency, The Test of Written English, is a required section of the TOEFL. It is a 30-minute essay test that demonstrated a student's ability to organize ideas on paper (ETS, 1990).

Originally, the TOEFL contained five different sections but in 1976, a three section test was introduced. In 1995, more modifications were made to the three sections and continual research and analysis was done to improve the test. In 1998, the computer-based TOEFL (TOEFL CBT) was introduced as part of test improvements. By 2005, the internet-based TOEFL (TOEFL iBT) which measured reading, listening, speaking and writing abilities was established. TOEFL CBT ceased after the TOEFL iBT was established in an area. The paper-based TOEFL (TOEFL PBT) was given in certain countries where TOEFL iBT was not available. On the following page, table 2 presents the score comparisons between the TOEFL iBT, TOEFL CBT and TOEFL PBT.

Table 2.

TOEFL: Internet-based, Computer-based & Paper-based Scores Comparison (ETS TOEFL iBT Score Comparison Table)

Internet-based	Computer-based	Paper-based
88-89	230	570-573
86-87	227	567
84-85	223	563
83	220	557-560
81-82	217	553
79-80	213	550
77-78	210	547
76	207	540-543
74-75	203	537
72-73	200	533
71	197	527-530
69-70	193	523
68	190	520
66-67	187	517

Rosenfeld, Leung, and Oltman (2001) created monograph series of papers and reports that were commissioned for test development efforts for the TOEFL and TOEFL 2000. A piece of the TOEFL 2000 project required reports and papers from experts in teaching and testing of language, as well as measurement. The reviews from this project ensued further developmental efforts to test construction, needs of the test taker, plus the delivery of the test.

Kirsch, Jamieson, Taylor, and Eignor (1998) characterized TOEFL test takers with their familiarity with computer usage. Results concluded that the majority of test takers at 50% were highly familiar with computers, 34% were moderately familiar and 16% were categorized as having low familiarity. Although data suggested little difference in familiarity with computers by gender, age and reasons behind taking the test, bigger differences existed between groups defined by native language plus native region. In another report done by Kirsch, Jamieson, Taylor, and Eignor (1998), the authors examined the TOEFL CBT test task performance and

computer familiarity. No significant findings in performance among examinees with low and high levels of computer competency were found.

Throughout the years, researchers had continued to evaluate and assess the accuracy as well as validity of the individual sections that comprise the TOEFL. Stansfield (1986) explained the history of the Test of Written English (TWE) during its developmental year. Readers underwent special training to score papers, pre and post tests were conducted to evaluate the topics, and technological problems were addressed. Sawaki and Nissan (2009) examined the listening section of the TOEFL iBT, measuring its relevance to everyday academic life for international students. The authors stated that students may perform better on the listening section if the lecture was given in a face to face academic context versus the same lecture on the internet. The study found a statistically significant difference among the subgroups of undergraduate and graduate students. The results indicated that undergraduate students did better than graduate students on the TOEFL iBT.

TOEFL Research

For years, TOEFL had been used as one of the main variables to decipher whether or not it could predict academic success. Sharon (1971) conducted a study on foreign graduate students to check if one's TOEFL and GRE scores could predict one's GPA. At the time this article was written, it was challenging for foreign students to gain admission into graduate schools. Sharon stated that foreign students' undergraduate GPA was not easy to evaluate since the system for grading was not standard around the world. However, these days there are organizations, such as World Education Services which specialize in credential evaluation (<http://www.wes.org/>). Sharon's study found that the TOEFL did not differ significantly from the GRE verbal. As a

result, the combination of or individual use of GRE and TOEFL scores did not significantly predict one's GPA.

In 1974, Heil and Aleamoni examined the TOEFL and English Placement Examination's (EPE) predictive ability. Because standardized test scores assisted in the evaluation of foreign student credentials the concurrent validity of each test was also analyzed. The study found that the TOEFL was significantly related, \Rightarrow .05 level, to GPA. Contrastingly, the EPE scores were not significant to GPA. Although the TOEFL was comprised of five parts it was believed to be culturally biased. According to the authors, Heil and Aleamoni, this reality indicated that a foreign student could be successful without following the formal rules of grammar.

Light, Xu, and Mossop (1987) conducted a study with international graduate students at the State University of New York at Albany. The researchers analyzed whether or not a relationship existed among TOEFL score, GPA, graduate credits, and degree earned. Although the TOEFL score significantly correlated with GPA it did not help in predicting academic success. Therefore, further analysis was conducted. Students were divided into two categories: 1) social sciences/humanities/fine arts; and, 2) business/science/math. A stronger correlation ($p < .001$) was found between academic success and language skills for social sciences/humanities/fine arts students than for business/science/math students. Another significant correlation ($p < .005$) was one's TOEFL score in relation to graduate credits. Results concluded that the students with higher scores on the TOEFL earned more credit hours. The author also concluded academic success could not be predicted by TOEFL score.

Thannisch (1992) studied undergraduate students at Texas A&M University to find relationships between the TOEFL, English Placement Test (ELP) scores, and GPA. This study found strong relationships between the TOEFL total scores and sub-test ELP scores (coefficients

between .65 to .85, $p < .05$). However, no significant statistical correlation was found between TOEFL and GPA (TOEFL total, $r = .30$, $p < .05$).

The 1996 Zhang study investigated whether the TOEFL could predict academic achievement at Southern Connecticut State University among five different language groups. There were no significant differences between the five language groups in regards to their scores on the TOEFL, first semester and final cumulative GPA. The null hypothesis with $p > .05$ failed to be rejected. It was confirmed that there was no correlation between overall GPA and TOEFL scores. The author concluded that the small correlation between TOEFL and predictor validity justified questioning the validity of using TOEFL scores.

Saisuphaluck (1997) investigated the relationship between several variables and academic success. The study consisted of 326 international graduate students who studied agriculture and related fields. In the final cumulative GPA, the total variance was 43.6% which was caused by the GPA in the first semester, funding source, presence of significant other, and TOEFL scores. Saisuphaluck concluded that there was a significant association between high final cumulative GPAs and high TOEFL scores.

Breland, Lee, Najarian, and Eiji (2004) investigated if there was a difference among gender with performance on the TOEFL CBT's writing prompts. The authors found that females tend to do better on tasks related to English language ability in comparison to males. On the other hand, Lin and Wu's (2003) results revealed that listening comprehension favored females, and grammar, vocabulary and cloze favored males. Overall, no significant difference was found between males and females in relation to English proficiency.

Neal (1998) examined the predictive validity of the GRE and TOEFL exams in relation to graduate GPA. The study's population consisted of international graduate students majoring in

science and engineering at Rose-Hulman Institute of Technology. Between graduate GPA and GRE quantitative score, there was a significant positive correlation (at the .05 and .025 levels). Another finding revealed that TOEFL scores did not have any predictive validity to academic success defined by graduate GPA since no significant correlation was found.

Person (2002) studied whether or not a relationship existed between international students accepted into Marshall University's career and technical education programs based on their TOEFL or ESL courses. Person found a low positive association (.266, $p < .05$) between first GPA and TOEFL scores. The results indicated that students who were admitted based on the TOEFL score were academically sound through their first semester.

In a 2002 study, Lo examined the relationship between first year GPA and TOEFL scores among freshmen international students at Texas A&M University from 1996-2001. From the study, 61% of the international freshmen who had equivalent to or above a 550 on the TOEFL, ended up with a one-year GPA less than a 3.0. International freshmen (39%) who scored below a 550 on the TOEFL ended up with a higher GPA at the end of the first year. It was concluded that the TOEFL score did not have any predictive validity in regards to academic success.

Stephenson (2004) conducted a comparative study on the relationship between cognitive and noncognitive factors with academic success. A statistical significance was found for foreign students ($F = 4.43$, $p < .05$) who finished their degree. All of the variables that were used (gender, finances, full-time enrollment, major change, program of study, and exam scores) contributed to a high percentage of the variance (adjusted $R^2 = .11$) in the amount of semesters needed for degree completion. No statistically significant relationship was found between the total mean scores of the TOEFL and graduate GPA, number of semesters needed for degree completion, or the probability of the completion of a Master's degree.

In a 2007 study, Ng examined whether the TOEFL was a good indicator of academic success for international students at community colleges. Academic success was defined by GPA, course completion as well as retention. Findings revealed a low association (.13), no significant relationship between TOEFL and GPA. An insignificant correlation was also found between the TOEFL and GPA (.06), degree completion (.06), and retention (.04); all very small or much smaller than typical effect sizes. Results revealed no significant relationships exist between TOEFL scores and ESL courses when related to international student's academic success. It was suggested that TOEFL is not a thorough indicator of measuring academic success for international students at community colleges.

Even though several of these studies primarily focused on the TOEFL scores' relationship to GPA and academic success, future research would benefit from considering the relationship between a variety of cognitive plus non-cognitive variables such as those found in studies done by Tanchareonrat (1988), Hu (1991), and Sanford (2009).

An analysis of the literature review enabled us to posit several definitions of academic success, including first year GPA, final cumulative GPA, degree completion and retention. For the purposes of this study, academic success was defined in terms of final cumulative GPA at degree completion.

TOEFL: Reliability Research. In Series I, Volume 3 of the TOEFL iBT research report entitled, "Reliability and Comparability of TOEFL iBT Scores," reliability was estimated by using the item response theory (IRT) (Lord, 1980) for the Reading and Listening sections. The Speaking and Writing sections utilized the generalizability theory (G-theory) (Brennan, 1983) to test reliability. These reliability measures were used to analyze each test.

Zhang (2008) conducted a study which compared the scores of over 12,000 test takers who took two TOEFL iBT tests in a one month period. Findings revealed correlations of 0.77 for the writing and listening sections, 0.78 for the reading section, 0.84 for the speaking section, and the total test score was 0.91. Zhang explained reliability measures took into consideration other variability influences therefore making the scores medium to lower than internal consistency measures. Regardless, these scores indicated a strong relationship in the ranked order of the test takers' scores.

TOEFL: Validity Research. Series 1, Volume 4 of the TOEFL iBT research report, "Validity Evidence Supporting the Interpretation and Use of TOEFL iBT Scores," stated the design and conceptualization of the TOEFL iBT (Chapelle, Enright, & Jamieson, 2008) was how the validation process began and to this day, there is continual validation research. According to this report, several research reviews and experiments about language use were done to evaluate if the test content was relevant to college and university students.

The report touched upon one concern about how much validation should be put into the relationship among TOEFL test scores and other external proficiency factors. According to Wang, Eignor, and Enright (2008) very high correlations were found between TOEFL CBT and TOEFL iBT ($r = .89$), since these were similar measures. On the other hand, Cohen (1988) found $r = .5$ when comparing measures that were different such as grades in school and scores on aptitude tests.

The IELTS

In 1980, the English Language Testing Service (ELTS) first appeared to replace the English Proficiency Test Battery (EPTB), multiple choice test battery. The British Council utilized the EPTB from the middle of the 1960s for screening purposes of international students

to UK colleges and universities. The ELTS possessed a modern format which displayed the current language learning and theories about teaching which were prevalent in the development in language testing. To further imitate language used in the real world, test tasks were constructed for academic settings that would relate to real life. Five general areas of tertiary education in the UK with one non particular area were covered in the following six modules: life sciences, social studies, physical sciences, technology, medicine and general academic (www.ielts.org).

In the 1980s, due to low test numbers coupled with obvious challenges with test administration, the time had come to revamp the test and in 1989, the IELTS was created. The need to expand participation on an international level caused the IDP Education Australia, British Council and Cambridge ESOL to partner, thereby creating the change in the test name.

The Cambridge Local Examinations Syndicate (UCLES) internationally administers the IELTS. The goals of both the TOEFL and IELTS were similar and each tests score was utilized by universities for admission purposes. The largest difference was the TOEFL was made for American universities and colleges' admission, while the IELTS was for companies and organizations that use English as a common language. This test was “to find out whether candidates are ready to study or train in the medium of English” (IELTS User Handbook p. 2).

IELTS is used to test English language proficiency all over the world. Educational institutions, potential employers, as well as professional entities and immigration authorities encompass the 7,000 institutions that utilized the IELTS for individual purposes. Although the IELTS was primarily used and accepted by most Australian, Canadian, New Zealand, and UK universities, nowadays there are over 3,000 educational institutions that accept the IELTS in the United States. The IELTS is administered in more than 135 countries (www.ielts.org).

IELTS was created to test one's reading, listening, writing and speaking skills. Unlike the TOEFL, this test was divided into modules. The listening, reading and writing modules have to be taken in one day. However, the speaking module can be taken on the same day but if there are certain country differences, there is a seven day window. The IELTS is comprised of a multitude of questions types. It ranges from short-answer, multiple choice diagram labeling to matching and classification. Unlike the TOEFL, the IELTS scoring are on a band scale from 1 to 9. After a score is recorded for each part of the test, each individual score is then averaged to create the mean overall band score. These scores are then described in half band increments.

IELTS Research

Bayliss and Ingram (2004) examined the relationship between the IELTS and predicting academic language performance. Results revealed that in general, students' language capabilities within their academic area were implied by their IELTS test score. No correlation was found between student performance and IELTS scores in tasks related to course-work since the IELTS did not test for that.

Wallace (1997) conducted research on the global implications of the IELTS' design of materials and curriculum. The author suggested that international students' frame of reference was not the same as traditional western students. Therefore, some of the British references and text in the IELTS might have been a disadvantage to the students.

Kerstjens and Nery (2000) conducted a study at an Australian university to investigate the predictive validity of the IELTS on academic performance and language difficulties of international students in Faculty's Technical and Further Education (TAFE) and Higher Education sectors of the Faculty of Business. Another objective examined if any of the scores on the individual IELTS portions' (listening, reading, writing and speaking) contributed to academic

success. There was small-to-medium predictive effect of the IELTS scores in relation to academic performance (8.4% and 9.1% variation on academic performance). The only significant predictor was the Reading portion of the IELTS in the total sample and Higher Education group. In the TAFE group, it was found that IELTS was not a significant predictor of academic performance.

Woodrow (2006) investigated if there was a connection among IELTS, professional experience, prior experiences in English language learning, and the effects on academic success. Results indicated that IELTS scores moderately predict achievement academically in a student's first semester. These results were in line with previous studies that indicated that factors outside of language proficiency were important to academic success.

The study by Cotton and Conrow (1998) examined the relationship between academic outcomes, predictions on language ability, and the IELTS. Overall, it was found that there were no positive correlations between IELTS scores and academic achievement which was defined by GPA, and staff and self academic ratings of performance. Avdi (2011) found a weak ($r = .359$) relationship between English language proficiency, which was measured by the overall and subtest scores on the IELTS, and academic achievement.

Dooley's 1999 study revealed that other factors, besides language proficiency in English, were essential to academic success of undergraduate students in the following disciplines: science, engineering and business. When higher levels of English language proficiency were required, other skills contributed to academic success. No concrete evidence found any predictive validity of IELTS. Furthermore, no particular major of undergraduate students did better in overall academic achievement when compared to one another.

Feast (2002) researched the association between IELTS scores and GPA and a positive relationship was found (coefficient = +0.39). Furthermore for postgraduate students, results revealed a strong or much larger than typical correlation (coefficient = +0.79) between IELTS students' study level and mean GPA. On average, a higher mean GPA was found for postgraduate students versus undergraduate students. Plus r is assumed.

IELTS: Reliability Research. Merrylees (1999) conducted a study testing reliability of the IELTS speaking test. The attitudes of examiners from several countries were analyzed. Phases of the speaking test differed in length. Results between score assessments in the various bands question the test's reliability when administered by examiners who did not push their candidate to their full potential. In this scenario, there appeared to be a large amount of words per candidate's response. Furthermore, the candidate's brief answers given due to the closed questions asked by the examiners provided little help to the examiner. Data revealed that examiners spoke as much as, if not more than, the candidates.

IELTS: Validity Research. Elder and Wigglesworth (2003) examined the relationship among three variables (planning, proficiency and task), in the oral section of the IELTS. The study wanted to answer whether or not having a planning time of one or two minutes increased test performance. No significant differences were found in the amount of time given to plan and performance on the test. Researchers concluded that pre-task planning for one minute should still be given to students for fairness reasons and the enhancement of the test's face validity.

Mickan, Slater, and Gibson (2000) investigated the IELTS Writing Subtest response validity. The study's purpose was to define the factors that possibly affect successful performance on the writing test. Readability analysis revealed that test prompt comprehension was due to explanation of the task's purpose and the task's lexical grammar. It was found that

socio-cultural impacts influenced one's writing abilities. The study recommended the benefit of qualitative procedures for response validity examination.

Bridges (2010) examined the IELTS Academic Writing Task 1 validity. Findings indicated the writing task did connect the cognitive abilities needed in the target language's realm. Writing Task 1 was found to be an exercise that conveyed knowledge and some processes were not fully tested in this task. There was no statistical significance found in difference of IELTS candidate view about the data and diagram tasks.

TOEFL vs. IELTS Research

Although little research had been done comparing these tests to one another, ETS did conduct a study in 2010 comparing scores between the TOEFL iBT and IELTS. The study found the majority of scores fell in the range of 5.5 to 7.5 on the IELTS and on the TOEFL iBT from 46 to 109. According to the results, 5% or less of the test takers did not score within this range. But more students who received higher scores may have been more willing to submit their test scores as opposed to others with lower scores. In all four sections, it was found that both the IELTS and TOEFL iBT score comparisons, would probably share a similar percentages of test takers whom passed.

In 1999, Hill, Storch, and Lynch, compared the IELTS and TOEFL as predictors of academic success. The study focused not only on English language proficiency, defined by the scores on the TOEFL or IELTS, but also the other factors that may influence academic success, defined by grade point average. During the interview, participants were asked to remark on the English language test they had taken. Most said that the IELTS' face validity was high. Findings revealed a moderately strong relationship between GPA and IELTS scores but the correlation between TOEFL scores and academic success was weak. Although no specific statistics were

given in the report, a chart showing non-linguistic factors and perceived difficulty was as follows: 1) Workload (N = 62, mean = 3.07, std. dev. = 0.92), 2) Concepts (N = 64, mean = 2.86, std. dev. = 1.02), 3) Resources (N = 64, mean = 2.55, std. dev. = 0.79, 4) Teachers (N = 64, mean = 2.55, std. dev. = 0.99).

Mahdavy (2008) researched the relationship between listening proficiency, comparing the IELTS and TOEFL listening tasks, and the role of multiple intelligences. According to the results, each intelligence score related positively to the TOEFL and IELTS listening scores. However, findings revealed a significant statistical contribution between linguistic intelligence and the TOEFL ($p < .19$) and IELTS ($p < .21$) listening task performance, despite the differences between these two tests.

Since the framework of each test was different, there was a challenge in comparing these tests on scores alone. The TOEFL iBT, which is the newest version of the TOEFL, was designed to test one's communicative competency in a computer format, while the IELTS is paper based. Farhady (2005) explained that each test contains structural and historical differences. Moreover, perspectives of researchers and fundamental theoretical gaps exist. Even so, these tests were standard and utilized worldwide when assessing English language abilities.

From the literature it is clear that there is a need to further review and compare the effectiveness of English language proficiency exams on academic success. Since the TOEFL and IELTS were most commonly used as admission criteria in U.S. higher education, this study focused on these tests and their relations to international graduate student academic success.

CHAPTER THREE: METHODOLOGY

Introduction

The research methodology of this study is explained in this chapter. The sections of this chapter are (a) the research design and rationale, (b) participants and site, (c) data collection, and (d) data analysis.

Research Design and Rationale

This study was a comparative and associational non-experimental design because no manipulation of the independent variables existed. Gliner, Morgan, and Leech (2009) defined attribute independent variables as the variables that are brought to the study by the researcher. The researcher did not control these characteristics; therefore, the primary focus was on the attribute independent variables that the institutions' data provided.

Sample and Site Selection

Various administrators and staff members at three institutions were contacted to ask for assistance in acquiring the data. These specific institutions were chosen for the similarities they shared in size, location, and student population numbers. These institutions were located in the Midwestern United States and were considered small-to-medium-sized, undergraduate and master degree granting institutions.

University A

University A offered undergraduate and master's degrees. The student population was about 7,000. In a given semester, approximately 500 international students were enrolled. For this study, 268 student records were used. University A had over 100 academic programs, which were offered in the four colleges: arts and sciences, business, education, and technology. Additionally, an Intensive English Program (IEP) was available at this institution.

University A's admission packet for an international student required a completed application and fee, official transcripts of secondary and post-secondary education, financial support documents, entrance exam scores (if applicable) and an official, passing TOEFL or IELTS score. While some graduate programs required higher test scores, the minimum required TOEFL and IELTS scores for graduate admission were as follows: TOEFL Paper-Based Test (PBT) was 520, TOEFL Internet-Based Test (iBT) was 68, and IELTS requires a minimum of 6.0 in all bands as well as the overall score. Furthermore, if the international student was a permanent resident, graduated from an accredited institution in the United States, language of instruction for their baccalaureate degree was in English, or the highest level of the IEP at this institution was completed, no TOEFL or IELTS score was required.

University B

University B offered undergraduate and master's degrees. The student population was just about 4,700, with roughly 370 international students in a given semester. For this study, 28 student records were used. University B had four colleges: arts and sciences, business and leadership, education and technology, and health and life sciences. Over 70 majors were available for undergraduate students. This institution also had an English as a Second Language Center for intensive English language study.

University B's graduate school application consisted of: application and fee, passport I.D. page, personal statement, letters of recommendation, official transcripts, financial form and bank certification, resume, entrance exams [i.e., Graduate Management Admission Test (GMAT), Graduate Record Examination (GRE), Miller Analogies Test (MAT)], in addition to a TOEFL or IELTS score. The following were the minimum English language proficiency test scores required: TOEFL Computer-based Test (CBT) was 213, TOEFL PBT was 550, or TOEFL iBT

was 79; IELTS required an overall band score of 6.5. If the international student had verification of English as their native language, proof of a baccalaureate degree or higher from an accredited institution in the U.S., or evidence of completing an approved intensive English language program, no TOEFL or IELTS score was required.

University C

University C offered undergraduate, master's degrees, specialist in education programs, and graduate level certificate programs. The student population was approximately 7,000, with around 270 international students in a given semester. For this study, 497 student records were used. The number of records used for this study was higher than currently enrolled international students since the records were from international graduate students who graduated within 2006-2011. University C had three colleges: arts and sciences, education and human services, and business and professional studies. There were approximately 135 undergraduate programs with more than 115 majors. This institution also had an English as a Second Language (ESL) Program.

University C's admissions requirements for graduate school included a completed international student application and fee, passport copy, official transcripts of secondary and post-secondary education, statement of support and bank statement, GRE or GMAT scores (if applicable), and official TOEFL or IELTS score reports. The following minimum English language proficiency scores were necessary: TOEFL PBT was 550, TOEFL iBT was 79, or a 6.5 on the IELTS. If a student's native language was English, then no TOEFL or IELTS score was needed.

International Student Selection

All of the international students selected for this study were at the graduate level and either held an F-1 or J-1 visa. According to the NAFSA: Association for International Educators Advisor's Manual, an F-1 student was defined as:

A nonimmigrant who is pursuing a "full course of study" to achieve a specific educational or professional objective, at an academic institution in the United States that has been designated by the Department of Homeland Security (DHS) to offer courses of study to such students, and has been enrolled in SEVIS (the Student and Exchange Visitor Information System). (<http://amdev.nafsa.org/core/nafsa/content/f-1-students>).

In comparison:

The J Exchange Visitor category was developed to implement the Mutual Educational and Cultural Exchange Act (Fulbright-Hayes Act) of 1961. The overall purpose of that Act, and the objective of the Exchange Visitor category, is "to increase mutual understanding between the people of the United States and the people of other countries by means of educational and cultural exchanges."

(<http://amdev.nafsa.org/core/nafsa/content/j-1-exchange-visitors>).

The majority of international students began as degree seeking students. Some students might have initially come to the institution on an exchange and then transferred to finish their degrees. Most of these students completed their master's programs in one to two years time.

Data Collection

The data requested for this study were collected by the graduate and research offices of the participating institutions. The data of international graduate students who graduated within 2006-2011 were used for this study. From each institution, the researcher asked for the following

data: (1) final cumulative GPA at graduation, (2) GPA at academic dismissal, (3) student's TOEFL or IELTS score, (4) student's age, (5) student's gender, (6) program of study, (7) undergraduate GPA and, (8) country of citizenship. The final data sets received from the institutions only had (1) final cumulative GPA at graduation, (2) student's TOEFL or IELTS score, (3) student's birth date, (4) student's gender, (5) program of study, and (6) country of citizenship. Student names were not shown on the data printout provided to the researcher. Since the data was received from the graduate and research offices of the three institutions, it was assumed that the sets of data were valid.

Data Analyses

The independent variables in this study were (a) student's TOEFL or IELTS score, (b) student's age, (c) student's gender, (d) student's country of citizenship and, (e) student's program of study. Each student's program of study was categorized under one of the four colleges (business, technology, education, and arts and sciences). These categories were the most general description of each major. Final cumulative GPA at graduation was the dependent variable. Three of the independent variables (student's gender, college program of study and country of citizenship) were categorical; however, all other variables were continuous. IBM SPSS Statistics 20.0 for Windows was used to analyze the data and answer the questions.

Question 1: What is the correlation between the TOEFL and IELTS scores on academic success defined by final cumulative GPA at graduation?

- a. What is the correlation between TOEFL iBT and final cumulative GPA at graduation?
- b. What is the correlation between TOEFL CBT and final cumulative GPA at graduation?

- c. What is the correlation between TOEFL PBT and final cumulative GPA at graduation?
- d. What is the correlation between IELTS and final cumulative GPA at graduation?

The first research question examined the correlations between TOEFL and IELTS scores, and academic success defined by final cumulative GPA at graduation. The independent variables (TOEFL and IELTS score) were continuous and the dependent variable (final cumulative GPA at graduation) was continuous. The associational questions were answered by using a Pearson r.

Question 2: What are the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective?

The second research question explained the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective. The independent variables (TOEFL and IELTS score) were continuous and the dependent variable (final cumulative GPA at graduation) was continuous. The associational question was answered by using a Pearson r.

Question 3: Are there differences between students from India, China, and Taiwan on their TOEFL and IELTS scores?

- a. What are the differences between India, China, and Taiwan on TOEFL iBT scores?
- b. What are the differences between India, China, and Taiwan on TOEFL CBT scores?
- c. What are the differences between India, China, and Taiwan on TOEFL PBT scores?
- d. What are the differences between India, China, and Taiwan on IELTS scores?

The third research question examined the difference between India, China, and Taiwan on TOEFL and IELTS scores. The independent variable (India, China, and Taiwan) were not continuous. The dependent variables (TOEFL and IELTS scores) were continuous. The suitable

statistical procedure to answer these research questions was performing a one-way ANOVA, analysis of variance.

Question 4: Is there a combination of TOEFL or IELTS scores, gender, and age that predict final cumulative GPA at graduation?

- a. Is there a combination of TOEFL iBT, gender and age that predict final GPA?
- b. Is there a combination of TOEFL CBT, gender and age that predict final GPA?
- c. Is there a combination of TOEFL PBT, gender and age that predict final GPA?
- d. Is there a combination of IELTS, gender and age that predict final GPA?

The fourth research question examined if there was a combination of TOEFL or IELTS scores, gender and age that predicted final cumulative GPA at graduation. The independent variables (TOEFL scores, IELTS scores, and age) were continuous. But the other independent variable (gender) was not continuous. The dependent variable (final cumulative GPA at graduation) was continuous. The suitable procedure to answer this research question was a correlation matrix for several variables. The correlation matrix tested for the strength of the relationship between the independent and dependent variables. Pearson correlations were computed to identify any correlations among the variables.

Question 5: Are there differences among college programs of study on the TOEFL and IELTS scores and academic success defined by final cumulative grade point average at graduation?

- a. Is there a difference between college programs of study on TOEFL iBT?

- b. Is there a difference between college programs of study on TOEFL CBT?
- c. Is there a difference between college programs of study on TOEFL PBT?
- d. Is there a difference between college programs of study on IELTS?

The fifth research questions (a, b, c) examined the correlations between the TOEFL iBT, TOEFL CBT, TOEFL PBT scores and academic success defined by final cumulative GPA at graduation, among international graduate students at three Midwestern universities. The independent variables (college programs of study) were not continuous. The dependent variables (TOEFL scores and final cumulative GPA at graduation) were continuous. The suitable statistical procedure to answer this research question was a one-way ANOVA. In addition, a post hoc Student-Newman-Keuls was performed to discover the source of the differences.

The fifth (c) research question examined the correlations between the IELTS scores and academic success defined by final cumulative GPA at graduation, among international graduate students at three Midwestern universities. The independent variables (college programs of study) were not continuous. The dependent variable (IELTS scores and final cumulative GPA at graduation) were continuous. The suitable statistical procedure to answer this research question was a one-way ANOVA. In addition, a post hoc Student-Newman-Keuls was performed to discover the source of the differences.

CHAPTER FOUR: RESULTS

Introduction

This chapter is structured by first giving a description of the students, and then by addressing the research questions. The students' descriptions illustrated all the characteristics of each variable related to final cumulative GPA of international graduate students. The research questions were:

- 1) What is the correlation between the TOEFL and IELTS scores on academic success defined by final cumulative GPA at graduation?
 - a. What is the correlation between TOEFL iBT and final cumulative GPA at graduation?
 - b. What is the correlation between TOEFL CBT and final cumulative GPA at graduation?
 - c. What is the correlation between TOEFL PBT and final cumulative GPA at graduation?
 - d. What is the correlation between IELTS and final cumulative GPA at graduation?
- 2) What are the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective? (explain the strongest and weakest correlations)
- 3) Are there differences between students from India, China, and Taiwan on their TOEFL and IELTS scores?
 - a. What are the differences between India, China, and Taiwan on TOEFL iBT scores?

- b. What are the differences between India, China, and Taiwan on TOEFL CBT scores?
 - c. What are the differences between India, China, and Taiwan on TOEFL PBT scores?
 - d. What are the differences between India, China, and Taiwan on IELTS scores?
- 4) Is there a combination of TOEFL or IELTS scores, gender, and age that predict final cumulative GPA at graduation?
- a. Is there a combination of TOEFL iBT, gender and age that predict final GPA?
 - b. Is there a combination of TOEFL CBT, gender and age that predict final GPA?
 - c. Is there a combination of TOEFL PBT, gender and age that predict final GPA?
 - d. Is there a combination of IELTS, gender and age that predict final GPA?
- 5) Are there differences among college programs of study on the TOEFL and IELTS scores and academic success defined by final cumulative grade point average at graduation?
- a. Is there a difference between college programs of study on TOEFL iBT?
 - b. Is there a difference between college programs of study on TOEFL CBT?
 - c. Is there a difference between college programs of study on TOEFL PBT?
 - d. Is there a difference between college programs of study on IELTS?

Description of Students

The data sample, from three Midwestern universities, were comprised of international graduate students who graduated with a master's degree within 2006-2011. The total number of student records utilized in this study were 793 (34.7% were female and 65.3% were male, see Table 3).

Table 3.

Demographic Information by Gender and Country

Country	Gender			
	Female		Male	
	<i>n</i>	%	<i>n</i>	%
India	170	30.47%	388	69.53%
China	25	41.67%	35	58.33%
Taiwan	23	41.82%	32	58.18%
S. Korea	9	64.29%	5	35.71%
Asia (other)	11	34.38%	21	65.63%
Middle East	8	50.00%	8	50.00%
Europe (other)	12	52.17%	11	47.83%
Africa	8	66.67%	4	33.33%
Central/S. America	4	40.00%	6	60.00%
Unknown	5	38.46%	8	61.54%

The descriptive statistics for this study can be seen in Table 4. The sample size consisted of 793 international students. Of that number, 401 students took the TOEFL iBT, 243 students took the TOEFL CBT, 120 students took the TOEFL PBT, and 29 students took the IELTS.

Table 4.

Descriptive Statistics for Dependent Measures

	N	Minimum	Maximum	Mean	Standard Deviation	Statistic	Std. Error
Final GPA	793	1.00	4.00	3.51	.492	-1.961	.087
TOEFL internet-based	401	55	117	87.45	11.210	.206	.122
TOEFL computer-based	243	102	540	234.40	29.705	4.183	.156
TOEFL paper-based	120	490	653	576.86	36.507	.111	.221
IELTS scores	29	5.5	7.5	6.069	.578	1.052	.434
Age	793	20	49	25.86	4.685	1.391	.087

The following figure shows the number of international graduate students by the college: technology, arts & sciences, business and education.

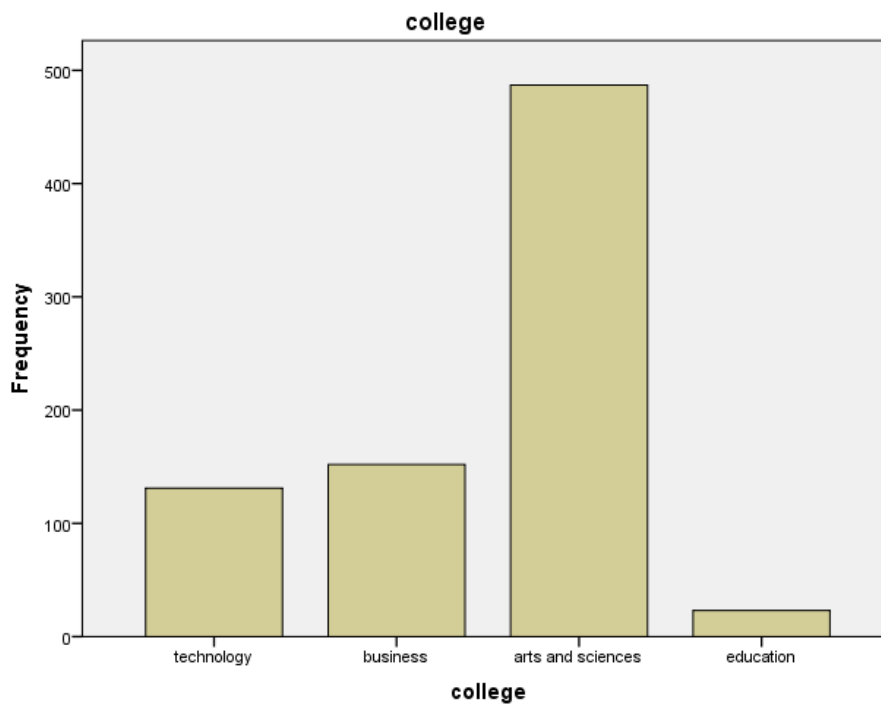


Figure 1. *Number of International Students by College*

Research Question 1

- 1) What is the correlation between the TOEFL and IELTS scores on academic success defined by final cumulative GPA at graduation?
 - a. What is the correlation between TOEFL iBT and final cumulative GPA at graduation?

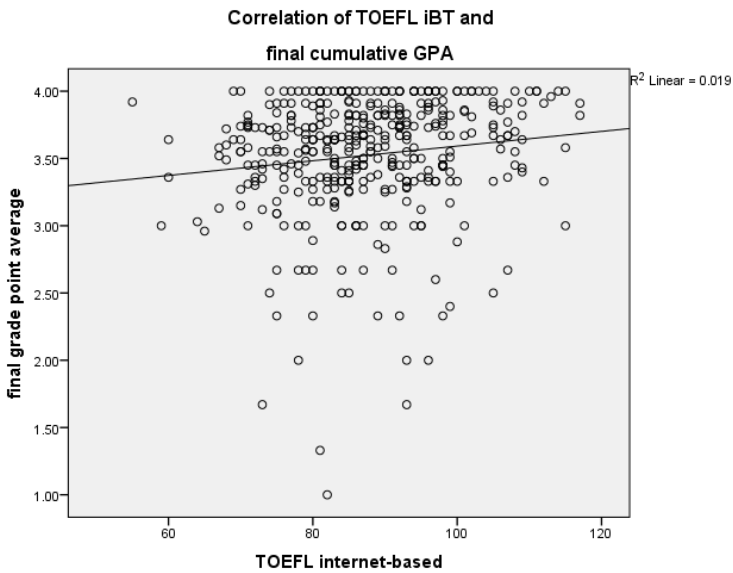


Figure 2. *Correlation of TOEFL iBT and Final Cumulative GPA*

Figure 2 displayed a straight linear regression line with $r^2 = .019$. A correlation was computed to determine if a statistically significant association between TOEFL iBT and final cumulative GPA existed. Pearson correlations revealed that $r(399) = .14, p = .006$. Although the correlation was significant, it only explained 2% of the variability between these two variables ($r^2 = .019$).

- b. What is the correlation between TOEFL CBT and final cumulative GPA at graduation?

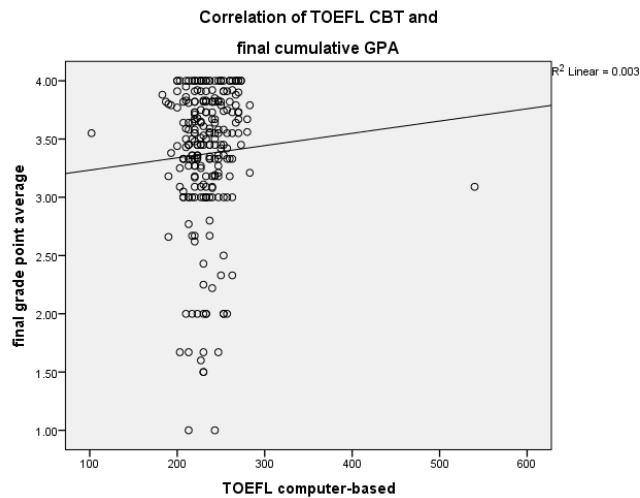


Figure 3. *Correlation of TOEFL CBT and Final Cumulative GPA*

Figure 3 displayed a straight linear regression line with $r^2 = .002$. A correlation was computed to determine if a statistically significant association between TOEFL CBT and final cumulative GPA existed. Pearson correlations revealed that there was no relationship between final cumulative grade point average and TOEFL CBT scores, $r(241) = .05$, $p = .424$, ($r^2 = .002$).

- c. What is the correlation between TOEFL PBT and final cumulative GPA at graduation?

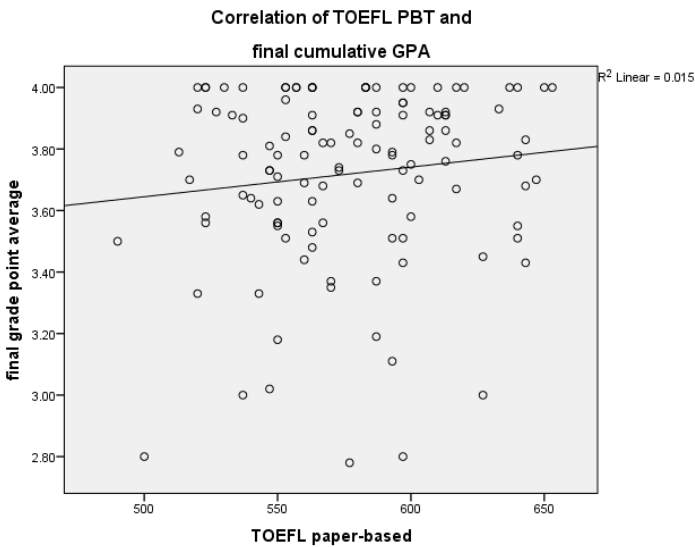


Figure 4. *Correlation of TOEFL PBT and Final Cumulative GPA*

Figure 4 displayed a straight linear regression line with $r^2 = .015$. A correlation was computed to determine if a statistically significant association between TOEFL PBT and final cumulative GPA existed. Pearson correlations revealed that there was no relationship between final cumulative grade point average and TOEFL PBT scores, $r(118) = .124, p = .177, (r^2 = .015)$.

d. What is the correlation between IELTS and final cumulative GPA at graduation?

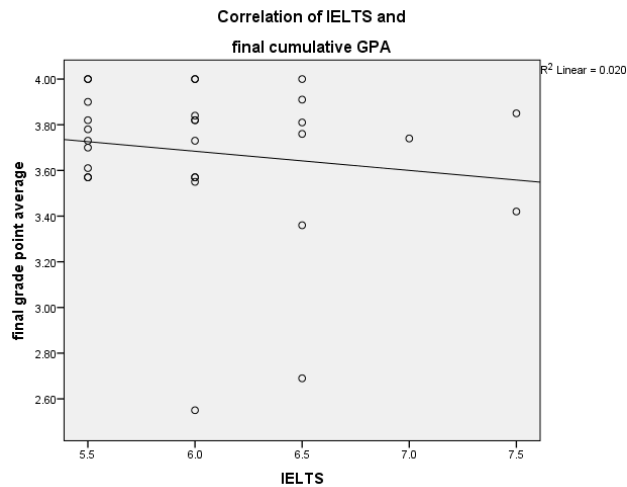


Figure 5. *Correlation of IELTS and Final Cumulative GPA*

Figure 5 displayed a straight linear regression line with $r^2 = .02$. A correlation was computed to determine if a statistically significant association between IELTS and final cumulative GPA existed. Pearson correlations revealed that there was no relationship between final cumulative grade point average and IELTS scores, $r(27) = -.14$, $p = .462$, ($r^2 = .02$).

Research Question 2

2) What are the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective? (explain the strongest and weakest correlations)

Pearson correlations revealed that the strongest correlation was found between TOEFL iBT (.14) and final cumulative GPA, followed by TOEFL PBT with .12, and TOEFL CBT with .05. IELTS had a correlation of -.14, but that could be due to the small N size.

Research Question 3

3) Are there differences between students from India, China, and Taiwan on their TOEFL and IELTS scores?

a. What are the differences between India, China, and Taiwan on TOEFL iBT scores?

There was a significant difference between students from India, China, and Taiwan on their TOEFL iBT scores, $F(2, 354) = 4.43, p < .0125$. Student-Newman-Kuels post-hoc analyses revealed that students from India ($M = 87.97, N = 319$) and Taiwan ($M = 86.71, N = 14$) performed significantly better than students from China ($M = 81.04, N = 24$).

b. What are the differences between India, China, and Taiwan on TOEFL CBT scores?

There was not a significant difference between students from India, China, and Taiwan on their TOEFL CBT scores, $F(2, 219) = 0.73, p > .4837$. Student-Newman-Kuels post-hoc analyses indicated that students from India ($M = 234.94, N = 206$), Taiwan ($M = 231.93, N = 14$) and China ($M = 210.00, N = 2$), did not perform significantly better when compared.

c. What are the differences between India, China, and Taiwan on TOEFL PBT scores?

There was a significant difference between students from India, China, and Taiwan on their TOEFL PBT scores, $F(2, 72) = 13.40, p > .0001$. Student-Newman-Kuels post-hoc analyses indicated that students from China ($M = 589.79, N = 24$) and India ($M = 588.96, N = 24$) performed significantly better than students from Taiwan ($M = 551.22, N = 27$).

d. What are the differences between India, China, and Taiwan on IELTS scores?

There was not a significant difference between students from India, China, and Taiwan on their TOEFL CBT scores, $F(1, 17) = 2.35, p < .1434$. The mean IELTS score for students from India was ($M = 6.17, N = 9$) and for students from China was ($M = 5.8, N = 10$). There were no students from Taiwan that took the IELTS.

Research Question 4

4) Is there a combination of TOEFL or IELTS scores, gender, and age that predict final cumulative GPA at graduation?

a. Is there a combination of TOEFL iBT, gender and age that predict final GPA?

The General Linear Model Procedure indicated that $r^2 = .09$. A correlation was computed to determine if a statistically significant association between TOEFL iBT, gender, age, on final cumulative GPA existed. To examine age, a median split was done to differentiate the ages into older and younger. For TOEFL iBT, $F(1, 397) = 12.50, p < .0005$, and the Eta squared was .01, which, according to Cohen (1988), is a small effect. For gender, $F(1, 397) = 5.52, p < .0193$, the Eta squared was .11, which, according to Cohen (1988), is a small effect. For age, $F(1, 397) = 24.76, p < .0001$, the Eta squared was .03, which, according to Cohen (1988), is a small effect.

b. Is there a combination of TOEFL CBT, gender and age that predict final GPA?

The General Linear Model Procedure indicated that $r^2 = .08$. A correlation was computed to determine if a statistically significant association between TOEFL CBT, gender, age, and final cumulative GPA existed. For TOEFL CBT, $F(3, 239) = .32, p > .5742$, and the Eta squared was .00. For gender, $F(3, 239) = .10, p > .7464$, the Eta squared was -.03, which, according to Cohen (1988), is a small effect. For age, $F(3, 239) = 19.86, p > .0001$, the Eta squared was .04, which, according to Cohen (1988), is a small effect.

- c. Is there a combination of TOEFL PBT, gender and age that predict final GPA?

The General Linear Model Procedure indicated that $r^2 = .05$. A correlation was computed to determine if a statistically significant association between TOEFL PBT, gender, age, and final cumulative GPA existed. For TOEFL PBT, $F(3, 116) = 1.37, p > .2440$, and the Eta squared was .00. For gender, $F(3, 116) = 1.65, p > .2010$, the Eta squared was .07, which, according to Cohen (1988), is a small effect. For age, $F(3, 116) = 3.17, p > .0777$, the Eta squared was .01, which, according to Cohen (1988), is a small effect.

- d. Is there a combination of IELTS, gender and age that predict final GPA?

The General Linear Model Procedure indicated that $r^2 = .00$. A correlation was computed to determine if a statistically significant association between IELTS, gender, age, and final cumulative GPA existed. For IELTS, $F(2, 26) = 0.02, p > .9758$. These were the means and sample sizes in technology ($M = 6.1, N = 10$), business ($M = 6.1, N = 18$) and arts & sciences ($M = 6.0, N = 1$). Although the analysis could be run there were so few cases that could be included to reveal a significance.

Research Question 5

- 5) Are there differences among college programs of study on the TOEFL and IELTS scores and academic success defined by final cumulative grade point average at graduation?
- Is there a difference between college programs of study on TOEFL iBT?
 - Is there a difference between college programs of study on TOEFL CBT?
 - Is there a difference between college programs of study on TOEFL PBT?

Table 7.

Means and Standard Deviations Comparing Final GPA and College Programs of Study

	Final GPA		
	<i>n</i>	<i>M</i>	<i>SD</i>
Technology	131	3.73	.23
Business	152	3.51	.39
Arts & Sciences	487	3.44	.55
Education	23	3.92	.11
Total	793	3.51	.49

Table 7 shows that the mean final GPA for technology students was 3.73, for business students it was 3.51, for arts & sciences students it was 3.44, and for education students it was 3.92.

Table 8.

Means and Standard Deviations Comparing College Programs of Study Differences on TOEFL Scores

College Programs	TOEFL iBT			TOEFL CBT			TOEFL PBT		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Technology	52	83.60	12.82	27	218.33	22.87	42	572.88	37.78
Business	53	88.60	12.94	38	250.00	54.70	43	578.12	31.19
Arts & Sciences	288	87.61	10.19	174	233.62	20.31	24	572.88	36.41
Education	8	99.25	14.24	4	228.25	21.27	11	595.82	48.67
Total	401	87.45	11.21	243	234.40	29.71	120	576.86	36.51

Table 8 shows the means and standard deviations comparing TOEFL scores to college programs of study. Statistically significant differences were found among college programs of study on final GPA, $F(3, 789) = 18.17, p \leq .001$, TOEFL iBT, $F(3, 397) = 5.38, p \leq .001$, and TOEFL CBT, $F(3, 239) = 6.67, p \leq .001$. Post hoc Tukey HSD Tests reveal that the technology and business groups differed significantly in their performance ($p < .05, d = .68$) as well as the business and education groups ($p < .05, d = 1.12$), which, according to Cohen (1988), is a large effect. Additionally, technology and arts and sciences groups ($p < .05, d = .44$) and education and arts and sciences groups ($p < .05, d = .89$) had a significant difference in their performance.

d. Is there a difference between college programs of study on IELTS?

Table 9.

Means and Standard Deviations Comparing College Programs of Study Differences on IELTS Scores

		IELTS Scores	
	<i>n</i>	<i>M</i>	<i>SD</i>
Technology	10	6.10	.32
Business	18	6.06	.70
Arts & Sciences	1	6.00	-
Education	-	-	-
Total	29	6.07	.58

Table 9 shows the means and standard deviations comparing the IELTS scores to college programs of study. No statistical difference was found between college programs of study and IELTS, $F(2, 26) = .02, p > .9758$.

CHAPTER FIVE: DISCUSSION

Introduction

Chapter Five is a summation and conversation of the relationship between the Test of English as a Foreign Language (TOEFL), the International English Language Testing System (IELTS) Scores and Academic Success of International Master's Students. For this study, data were collected from three Midwestern undergraduate-masters level universities that admitted international students. The data consisted of the following variables: final cumulative GPA at graduation, student's TOEFL or IELTS score, student's birthdate, student's gender, program of study, and country of citizenship. The objective was to examine relationships between TOEFL or IELTS scores, and academic success defined by final cumulative GPA.

The findings regarding each of the research questions will be discussed in this chapter, connecting the findings from the present study to the literature and reviewing implications of the findings, and proposing closing comments.

Research Questions and Findings

The research questions considered were:

- 1) What is the correlation between the TOEFL and IELTS scores on academic success defined by final cumulative GPA at graduation?
 - a. What is the correlation between TOEFL iBT and final cumulative GPA at graduation?
 - b. What is the correlation between TOEFL CBT and final cumulative GPA at graduation?
 - c. What is the correlation between TOEFL PBT and final cumulative GPA at graduation?

- d. What is the correlation between IELTS and final cumulative GPA at graduation?
- 2) What are the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective? (explain the strongest and weakest correlations)
- 3) Are there differences between students from India, China, and Taiwan on their TOEFL and IELTS scores?
 - a. What are the differences between India, China, and Taiwan on TOEFL iBT scores?
 - b. What are the differences between India, China, and Taiwan on TOEFL CBT scores?
 - c. What are the differences between India, China, and Taiwan on TOEFL PBT scores?
 - d. What are the differences between India, China, and Taiwan on IELTS scores?
- 4) Is there a combination of TOEFL or IELTS scores, gender, and age that predict final cumulative GPA at graduation?
 - a. Is there a combination of TOEFL iBT, gender and age that predict final GPA?
 - b. Is there a combination of TOEFL CBT, gender and age that predict final GPA?
 - c. Is there a combination of TOEFL PBT, gender and age that predict final GPA?
 - d. Is there a combination of IELTS, gender and age that predict final GPA?
- 5) Are there differences among college programs of study on the TOEFL and IELTS scores and academic success defined by final cumulative grade point average at graduation?
 - a. Is there a difference between college programs of study on TOEFL iBT?
 - b. Is there a difference between college programs of study on TOEFL CBT?

- c. Is there a difference between college programs of study on TOEFL PBT?
- d. Is there a difference between college programs of study on IELTS?

Discussion of the Results Addressing Question One

- 1) What is the correlation between the TOEFL and IELTS scores on academic success defined by final cumulative GPA at graduation?

The first research question examined the correlation between TOEFL or IELTS scores and final cumulative GPA at graduation. Although it was a smaller than typical effect size (possibly affected by the *N* size), a weak correlation existed between TOEFL iBT scores and GPAs. Since the relationship between TOEFL iBT scores and final cumulative GPA (academic success) was weak, it is important to consider the other cultural and external factors that play a role in one's academic success. These findings may be useful when advising students throughout their graduate program so they are informed and reminded that hard work throughout their academic career is necessary to achieve a high final cumulative GPA. Only scoring high on the TOEFL iBT is not enough for one's academic success.

Discussion of the Results Addressing Question Two

- 2) What are the rankings of the correlations of the TOEFL and IELTS on final cumulative GPA from most effective to least effective?

The second research question ranked the correlations between TOEFL or IELTS scores and final cumulative GPA at graduation. The study found that TOEFL iBT (.14) had the most significance followed by TOEFL PBT (.12) and TOEFL CBT (.05). The varying *N* sizes could have influenced the results. IELTS with a -.14 could have been due to the small *N* size.

The higher ranking with TOEFL iBT and TOEFL PBT could mean that students who took the tests were more comfortable with a paper format or using computers. Another reason could

be that their English level was higher and their vocabulary was larger to begin with. Some students do better on standardized tests and read the instructions more thoroughly. It is a possibility that the students partook in TOEFL preparation courses, studied preparation materials, and took practice exams.

Discussion of the Results Addressing Question Three

- 3) Are there differences between students from India, China, and Taiwan on their TOEFL and IELTS scores?

The third research question examined the correlations between the TOEFL and IELTS scores with students from India, China, and Taiwan. Indian and Chinese students performed better on the TOEFL PBT. On the TOEFL iBT, Indian and Taiwanese students performed significantly better.

There are several uncontrollable variables that could have influenced the study's findings. Socio-economic status could play a role, especially if families have more of the financial means to help support their children take preparatory classes and are able to buy test taking materials and resources. Motivational level and prior educational and English language proficiency levels could also contribute to the study's findings. If an international student is motivated to study and better prepare themselves for the exams, their extra effort could result in better test scores. Another factor that could be taken into consideration is whether or not a student's education is funded by their government or if they are on a scholarship versus if their family is paying for the education. If an international student's family is paying, it possibly generates a stronger sense of responsibility and obligation to complete their studies in a timely manner. Depending on the type and amount of government stipend, international students might not have the same sense of responsibility as they would to their family.

Discussion of the Results Addressing Question Four

- 4) Is there a combination of TOEFL or IELTS scores, gender, and age that predict final cumulative GPA at graduation?

The fourth research question examined the relationship between the TOEFL or IELTS scores, gender, age and academic success defined by final cumulative GPA at graduation, among international graduate students at three Midwestern universities. Although a significant relationship was found, only 9% of the variance with TOEFL iBT, 8% of TOEFL CBT, and 5% of TOEFL PBT was explained.

Admissions standards vary from institution to institution. Some graduate schools evaluate each variable of admission criteria separately, while others may look at the requirements as a whole. Some institutions are stricter with admissions requirements due to the type of institution, prestige and location. On the other hand, if the goal is to have increased numbers, an institution might not be as strict with their admissions requirements. For the universities which participated in this study, one of the admission requirements was a specific undergraduate GPA. If a TOEFL or IELTS score was high but the undergraduate GPA was on the borderline of the cut-off, then admissions counselors may decide to admit the student based on the high English language proficiency score. The results from this study suggested that there was no indicated relationship between the TOEFL or IELTS score and academic success, so in the end using the English language proficiency score as the determining factor may not be wise, especially if the GPA is low or questionable.

Discussion of the Results Addressing Question Five

- 5) Are there differences among college programs of study on the TOEFL and IELTS scores and academic success defined by final cumulative grade point average at graduation?

The fifth research question examined the correlations between the TOEFL and IELTS scores, college programs of study, and academic success defined by final cumulative GPA at graduation, among international graduate students at three Midwestern universities. Technology students mean GPA was 3.73, which was higher than the mean GPA for business students at 3.41 and arts & sciences students mean GPA at 3.44. Overall, education students had the highest mean GPA at 3.92. Results also revealed that each of the college programs of study had differences in their performance when compared among each other to final GPA, TOEFL iBT and TOEFL CBT. Differences existed between technology and business, business and education, technology and arts and sciences, and education and arts and sciences.

College programs of study in education not only had the highest mean GPA at 3.92, but they also had the highest mean TOEFL iBT score at 99 and highest mean TOEFL PBT scores at 596. However, the *N* was the smallest when compared to the rest of the college programs of study groups. Although college programs of study in technology had the second highest mean GPA at 3.73, their mean TOEFL iBT, TOEFL CBT, and TOEFL PBT (tied with arts & sciences) scores were the lowest. This suggests that a relationship between TOEFL scores and final cumulative GPA may not exist.

There are several causes as to why this may be the case. Firstly, certain majors may have more technical language that presents challenges for students whose second language is English. Older students may have had more work experience related to their area of study. This may have helped them to better understand topics related to their college program of study. Another reason could be grade inflation or that the coursework varied among college programs of study and some may not have been as rigorous.

Differences among GPAs in the various college programs of study could have been the result of different learning styles. Different departments have alternative ways of connecting with and educating students. Some departments may place equal weight on skills such as creativity and synthesis to increase student performance. On the other hand, other departments may ask students to be more analytical. This wide and different range of expectations and performance outcomes, are also factors that influence one's academic success.

The fifth research question also examined the correlations between the IELTS scores, college program of study, and academic success defined by final cumulative GPA at graduation. No statistical difference was found between college programs of study and IELTS. This could be due to the small *N* size.

Findings and Review of Literature

This study sought to examine the relationship between the TOEFL and IELTS scores and academic success of international master's students. The following section explains the relationships found between the English language proficiency tests and influencing factors of academic success among Midwestern international graduate students.

TOEFL

According to Neal (1998) and Lo (2002) TOEFL scores did not have any predictive validity to academic success. Stephenson (2004) did not find statistical significance between total mean scores on the TOEFL and graduate GPA. Moreover, Thannisch (1992) found no statistically significant relationships between TOEFL and GPA. However, this study found a weak relationship between final cumulative GPA and TOEFL iBT. As a result, this study's findings were similar to Zhang (1996) who concluded that the weak correlation between the TOEFL and predictor validity justified questioning the validity of using TOEFL scores. This study was

different from Saisuphaluck (1997) who concluded that there was a significant association between high final cumulative GPAs and TOEFL scores. The differences in other studies' results in relationship to this study could be the varying size and type of institution, plus the different tiers and influencing cultural factors.

In Kirsch, Jamieson, Taylor, and Eignor's 1998 report a small difference between computer familiarity and age was found. This study revealed a negative correlation between TOEFL iBT and age, meaning that older students did not necessarily have higher TOEFL iBT scores. This could mean that older students were used to taking tests on paper and not as comfortable with test taking and using technology. This phenomenon may gradually disappear as more people take computer courses or pursue higher levels of education and become more comfortable using technology.

Another interesting finding in this study was that the results indicated that males average score on the TOEFL CBT was higher than females. There was also a significant difference found between final GPA among males and females, revealing that females' GPA was higher. Despite the fact that males performed better on the TOEFL CBT, females had higher GPAs. Attending courses and studying in a classroom face to face, differs from taking a test on the computer. The results from this study could be due to different learning styles, behavior and classroom environment. Green and Foster (1986) found that better academic achievement was found among females due to more curiosity stemmed from intrinsic motivation. Due to gender differences and genetic make-up, women and men have completely different through processes which affect the way information is being received and understood in the classroom.

The participating institutions set their cut off scores by comparing their scores with universities that are similar in size and regionally accredited. Then the scores are based off the

average and then amended as needed. If the university outcome is to have higher GPAs, then they may choose to recruit international students in majors that they know are more likely to succeed and who have higher GPAs. Specific GPA standards may be needed as a bench mark to ensure accreditation requirements are being met. Therefore, in order to maintain a certain level of academic success and for retention purposes, universities may want to focus on recruiting students who have proven to do better academically.

The findings of this study found a negative correlation between TOEFL iBT and age, meaning that older students did not necessarily have a higher TOEFL iBT score. One possibility for this finding is that older students may not feel as comfortable with using the computer; therefore, TOEFL test task performance might be influenced by computer familiarity. On the other hand, the findings of this study were different from Kirsch, Jamieson, Taylor, and Eignor (1998). Their report examined age and computer familiarity revealing no significant findings in performance among examinees with low and high levels of computer competency.

Throughout one's academic career, there are instances where in order to pass a test, write a paper, listen to a lecture or participate in an activity, it is important to have English language ability and proficiency. Breland, Lee, Najarian, and Eiji (2004) found that females tend to do better on tasks related to English language ability than do males. The present study discovered that females tended to have a higher final cumulative GPA when compared to males. The findings from Lin and Wu (2003) which did not fit with my findings were that no significant difference between males and females in relation to English proficiency existed.

Light, Xu, & Mossop (1987) found that GPA and TOEFL score were significantly higher for students who majored in humanities, fine arts, and social science in comparison to students who majored in science, math and business. Although the TOEFL score significantly correlated with

GPA it did not help in predicting academic success. Authors concluded that there was a strong tie between language proficiency and academic success for students in humanities, fine arts, and social science. In my study, the results also found that students in colleges programs of study in education had the highest mean GPA and college programs of study in arts & sciences had the lowest mean GPA. Although the majors from the previous study differ from mine, there may be overlap in the division of the majors among the college programs of study. Moreover, different learning styles, ability for second language acquisition, instructor's willingness to work with international students, cultural adjustment factors and personality traits could influence one's final cumulative GPA.

IELTS

Woodrow (2006) found that IELTS scores were moderately related to academic achievement in a student's first semester. In Feast's 2002 study, a strong correlation was found between IELTS students' study level and mean GPA. However, this study did not find any relationships between IELTS scores and academic success. The findings from this study were more similar to Kerstjens and Nery (2000), who found that the IELTS was not a significant predictor of academic success in one of the study's groups. Additionally, this study's results echoed Cotton and Conrow (1998) who found no positive correlations between IELTS scores and academic success.

Dooley's (1999) study found that additional skills, besides language proficiency, are necessary for academic success. This study found that the mean final GPA for technology students was 3.73, for business students it was 3.51, for arts & sciences students it was 3.44, and for education students it was 3.92. Overall, education majors may not have to learn as much technical language as in the other college programs of study which could have contributed to the

higher overall GPA. Dooley found international students who do not have the English language proficiency cut-off scores, still have the possibility of academic success. This gives merit to examining each student's case and requirements for admission differently.

Practical Considerations and Recommendations

From my past and current experiences working with international students, it is important that educational institutions recognize their contribution to a student's academic success.

Universities and colleges should have resources in place that assist international students with their academic success and retention. One way is having a Transitions or Freshmen Experience course that helps with international students' transition to life and study in the United States as well as introduces the resources available on campus and in the community.

Developing mentor or advocate programs where successful international students could serve as mentors and role models for new students beginning their academic journey could assist with academic success. Additionally, having programming events and U.S. American buddy programs that encourage interaction between international and domestic students would be beneficial.

Additionally, below are a few other recommendations:

- Educators advising international students throughout their graduate program should remind students that hard work throughout their academic career is necessary to achieve a high final cumulative GPA. Scoring very well on the TOEFL iBT is not enough to predict one's academic success.
- Since there was only a weak relationship between TOEFL iBT and final cumulative GPA, it is possible that current cut-off scores for graduate students at smaller

comprehensive state institutions could be reevaluated to accept international students with lower TOEFL or IELTS scores for admission.

- Advise international students to keep working on and improving their English language abilities. The higher command of English language can assist with a better understanding of classroom lecture and assignments.

Limitations

- A limitation to executing my study to the exact parameters that I had intended was due to insufficient data set elements (missing undergrad GPA and academic dismissal GPA from two institutions).
- Only GPA at graduation could be used as the definition for academic success since the academic dismissal GPA was missing.
- The *N*'s were either too small and very spread out, therefore testing for relationships between country, TOEFL or IELTS scores and GPA could not be examined.
- Since the data collected had all ranges of the TOEFL test format, the scores could not be converted into one standardized score. The range of test scores was not precise and the data would have been skewed if the table was converted. This issue would result in the numbers being artificially determined. The Educational Testing Service (ETS) created concordance tables that inform users how a TOEFL PBT score equates to a TOEFL CBT score. Banerjee (2003) explained that ETS suggests that instead of looking at the exact cut-off scores, the range to which the corresponding score falls under is what should be considered. The TOEFL group could have had one large sample size as opposed to three different groups (TOEFL iBT, TOEFL CBT, and TOEFL PBT).

- Since data for each student only had either a TOEFL or IELTS score, statistical tests comparing the performance and predictive ability of these English language tests could not be done.

Suggestions for Future Research

For future research, it is recommended that English language proficiency scores be compared to both final cumulative GPA at graduation and academic dismissal GPA. If academic success is defined as final cumulative GPA, then students who did not succeed and are academically dismissed are not successful. It would be interesting to know if there is a relationship between English language proficiency scores and the lower GPAs of students who were academically dismissed.

It is suggested that exploring undergraduate GPA as one of the variables associated with academic success be considered for inclusion in future research. Besides the English language proficiency test scores and their relationship to GPA, it may be beneficial to examine whether international students' undergrad GPA is also related to graduate GPA as a measure of academic success.

Conducting research that involves qualitative approaches which include interviews and surveys would add to the data that was obtained from academic records. There are several other factors that possibly influence academic success that can not be determined through numbers alone. Research that involves communicating with international students and hearing their stories, would add to the statistical data that can be retrieved from test scores and demographic information.

Further exploration of the cultural factors that are involved in academic success needs to be done. Addressing the cultural factors that influence academic success such as individualist vs.

collectivist cultures and in group vs. out group, could add to the holistic picture of explaining the additional factors that influence international students' academic success. Further studies taking into account gender differences and relationship to test taking and GPA may be useful as well.

All of the hypotheses that had been generated from this study serve as potential explanations. Although differences are shown, the exact reasons for those differences were unknown. Additional data collection to test these hypotheses would be beneficial and informative.

Closing Remarks

The motivation for this study was to contribute to the limited research comparing the TOEFL and IELTS scores. The results could contribute to institutions by providing a better understanding of the criteria under which students are admitted. These findings may also help advisors when advising students since test scores alone do not predict academic success. Trends or information found in the study could benefit graduate offices in devising strategic plans for recruitment, retention, and internationalization. My hope is that the study's results will assist offices that deal with international student recruitment and admissions, to think about the relationships between English language proficiency scores and academic success.

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