
Original Paper

Writing Proficiency: Its Impact on International Students Attending Higher Education Institutions

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Abstract

Writing proficiency has been identified as a skill that predicts international students' academic success. Disaggregating the responses of international students on the UCUES 2012 Survey, and utilizing structural equation modeling to determine the direct and indirect effects of writing proficiency on cognitive growth, faculty-student interaction, and academic effort, the researcher found that not only did writing proficiency predict international students' cognitive skills development, but writing proficiency also predicted international students' opportunities to interact with faculty and their academic effort. Identified needed supports for international students included more English instruction, faculty-student interaction, encouragement of higher levels of academic effort, and critical thinking assignments. Moreover, faculty and staff must be better informed of pedagogical and educational differences between the United States and the countries from which international students originate, including their unique learning styles.

Keywords: international students, cognitive skills development, writing proficiency, academic effort

1. Introduction

International students have been enrolling in U.S. higher education institutions to study, teach, and research since 1784 (Jenkins, 1983). This student population has continued to grow, until in 2017, Open Doors reported that the number of international students entering the United States to pursue a tertiary education had surpassed one million. Garcia and de Lourdes Villarreal (2014) have explained this exponential growth as a consequence of the inadequate higher education infrastructure in some developing countries. Chevalier (2014) added that the global need for greater English proficiency in the sciences has also led international students to English.

Some higher education leaders have suggested that the provision of student services for international students on their U.S. campuses is a financial drain and should not be encouraged (Banjong & Olson, 2016). Other critics have reported that international students increase domestic unemployment (Shih, 2015). However, researchers have reported numerous national, global, institutional, and individual benefits associated with the presence of international students (Mamiseishvili, 2012). Although not an exhaustive list, the national benefits included the following: (a) an additional \$32.8 billion was added to the U.S. economy as well as an increase of 400,000 jobs in the 2015-16 academic year alone (NAFSA, 2016); (b) more than half of international students enter their U.S. tertiary programs with advanced degrees in science, technology, engineering, and math, which results in research contributions that benefit both the United States and the world (Ruiz & Budiman, 2018); (c) cultural competency is cultivated among domestic students as a result of their relationships with international students on college campuses (de Guzman, Durden, Taylor, Guzman, & Potthoff, 2016), which better prepares domestic students to "study, work, and travel," internationally ("Why Are International Collaborations So Important for Universities?" (2018, para. 4); and (d) if these international students decide to remain in the United States, two additional benefits are the intellectual capital that they add (Lee & Rice, 2007) and the relief that they give to "demographic pressures of an aging population" (Moore, Rutherford, & Crawford, 2016, p. 858).

The global benefits attributed to the presence of international students on the campuses of U.S. higher education institutions are an increase in amicable relationships among domestic and international leaders

when government heads from other nations have studied in the United States (Matthews, 2017). In addition, opportunities for collaboration among domestic students and scholars living in other countries, which otherwise might have not occurred, increase as a result of the presence of international students who study in the United States (de Guzman, Durden, Taylor, Guzman, & Potthoff, 2016).

College and universities benefit from the international students populating their campuses as well. The most obvious benefit is the increase in sensitivity and understanding of domestic students toward international students (Hechanova-Alampay, Beehr, Christiansen, & Van Horn, 2002). Second, Moore et al. (2016) have identified the different perspectives and experiences accompanying international students as invaluable to domestic higher education students. Because international students generally enroll in U.S. higher institutions with more work experience and developed skills than domestic students of the same age, the third campus benefit is an increase in the quality of research that is conducted as a result of the collaboration among international and domestic students (Trice, 2003). The fourth benefit relates to the prestige and academic quality of U.S. higher education institutions: The presence of international students boosts their reputation and increases their attractability to future international students (Trice, 2003). As a result of reductions in state budgets comes the fifth benefit: The higher tuition fees paid by international students offsets the state reductions (England-Siegerdt, 2013; Grapevine Report, 2014; Hegarty, 2014). Finally, many international students are STEM (science, technology, engineering, mathematics) majors, and their presence strengthens existing departments such as science, engineering, and technology (Altbach, 2004; Redden, 2013b).

The above discussion of the benefits afforded by the presence of international students on U.S. higher education campuses has explained the reasons for the interest of university leaders in providing support to ensure that this student population thrives. Although not examined in depth, the challenges faced by international students coming to the United States are significant as well. Language, pedagogical differences, self-segregation, discrimination, legal issues, cultural misunderstandings, loneliness, homesickness, stress, and unclear communication are a few barriers faced by international students (Altbach, 1989; Al-Sharideh & Goe, 1998; Bista & Foster, 2011; Dongfeng, 2012; Heggins & Jackson, 2003; Lee, 2010; Li & Kaye, 1998; Lin, 1999; Mahmood, 2014; Moore et al., 2016). Much courage is required on the part of international students when they seek a tertiary education outside of their home country. Yet, many of these students are determined to overcome these challenges and procure a quality education at a prestigious higher education institution in the United States.

1.1 Purpose

Knowing that international students have cited academic achievement as an important factor when choosing to study in the United States (Lee & Rice, 2007; Mamiseishvili, 2010), and that they expect positive educational outcomes (Arkoudis, 2009; Heggins & Jackson, 2003; Mamiseishvili, 2010), this researcher sought to provide post-secondary educators with greater understanding of the factors that contribute to the academic achievement of international students. Although many factors have been identified as predictors of academic success, for the purposes of this submission, writing proficiency was explored as a predictor of cognitive growth, faculty-student interaction, and academic effort. Hence, the following research question guided this research study: What are the direct and indirect effects of writing proficiency on cognitive growth, faculty-student interaction, and elevated academic effort?

1.2 Significance

As stated above, international students bring global, national, institutional, and individual benefits when they enroll in U.S. higher education institutions. Maintaining a steady stream of incoming international students is critical to the overall health of universities and colleges in the United States. Although most higher education leaders welcome international students on their campuses, not all administrators understand the challenges that international students face. Therefore, the purpose of this research study sought to inform university leaders of the significance of entry-level writing as a predictor of cognitive skills development, faculty-student interaction, and academic effort; and to justify the need for student writing support if this international body of students is to thrive maximally on U.S. higher education campuses.

2. Literature Review

A growing body of literature focused on the benefits and challenges of international students exists to increase the understanding of higher education leaders. Included below are those findings that enhance the understanding and value of this research study to the reader.

2.1 Writing Proficiency

International students must be proficient writers if they are to experience maximal cognitive skills growth and accomplishment of their educational goals. A number of researchers have identified English writing ability as a significant factor in the academic success of international students attending highly selective research universities (Khanal & Gaulee, 2019; Martirosyan, Hwang, & Manjohi, 2015). Certain academic activities are difficult for those international students who cannot write proficiently. Crusan (2010) noted that international students struggle more than domestic students to understand and meet the expectations of faculty members for proficient writing. Furthermore, even with good grammatical skills, some international students fail to meet professors' expectations because their submission lacks the expected organization (Crusan, 2010). Some professors have reported that international students' paragraphs lack coherency (Singh, 2015). Connor (2002) suggested that this incoherency might be due to "the linear argument preferred by native English speakers" (p. 497). Casanave (2004) added that "differences that affect writing across cultures have included rhetorical patterns of organization, composing conventions, cohesion and coherence patterns, writing conventions affecting choice and frequency of text types, and knowledge of audience expectations" (p. 22). These cultural differences may affect international students' articulation of thoughts on essay exams; synthesis of journal articles for research papers; writing of academic papers; and meeting the expectations of American professors that are different from the writing expectations of educators in other countries (Kuo, 2011; Mori, 2000; Safipour, Wenneberg, & Hadziabdic, 2017; Singh, 2015).

Subsequent researchers have confirmed the findings of Casanave (2004) and Connor (2002) that there are prominent differences among cultures in terms of rhetorical conventions, cultural schemata, and writing perspectives or expectations (Crusan, 2010; Lindsey & Connor, 2011; Zhang & Mi, 2010). International students must become competent in the literary skills of the host culture if they expect to achieve academically in their chosen educational setting. They must be given opportunities to practice English writing and receive corrective feedback if optimal academic growth is to be achieved (Zhang & Mi, 2010). Because English writing requires high-level cognitive functions, which requires planning, synthesizing, organizing, composing, and revising if proficiency is to be achieved, Zhang and Mi (2010) noted that the training needed to master the literary skills of a culture requires more than that of the tertiary years; hence, international students without proficient English writing ability face insurmountable challenges when they enter U.S. higher education institutions (Johnstone, Ashbaugh, & Warfield, 2002; Zhang & Mi, 2010).

2.2 Cognitive Skills Development

Writing proficiency has been found to predict cognitive skills development (Author 1); cognitive skills have been linked to academic achievement (Khanal & Gaulee, 2019; Martirosyan, Hwang, & Manjohi, 2015). Hence, an exploration of the direct and indirect effects of writing proficiency on cognitive skills development was warranted. Many definitions for cognitive skills development exist in literature; however, for the purposes of this submission, cognitive skills development referred to "the acquisition of general intellectual or cognitive competencies and skills, which if they are not so directly tied to a particular curriculum or course of study, are nevertheless thought to be salient outcomes of postsecondary education" (Jones, 1994, as cited in Pascarella & Terenzini, 2005, p. 155). by those individuals who are invested in U.S. higher education institutions.

Cognitive skill development and international students. When surveyed as to why they were attracted to higher education institutions in the United States, international students reported that they hoped to develop their "critical thinking, problem solving and intellectual creativity" (Hesel, 2012, p. 6). These three learning skills fail to receive much focus in many of these students' host countries because "a pedagogic approach based on memorization and didacticism" (p. 2) is preferred. Because critical thinking, problem solving, and intellectual creativity are closely connected to cognitive skills

development, and because writing proficiency has been found to predict cognitive development (Author 1), greater understanding of writing proficiency and cognitive growth among international students is beneficial for higher education leaders.

2.3 Faculty-student Interaction

In addition to cognitive skills development, writing proficiency has been suggested as a predictor of faculty-student interaction (Author 1). Although international students adjust quickly to hearing and speaking English as a result of their presence in higher education classrooms, expressing complex ideas can be difficult. Zhang and Mi (2010) noted that faculty become extremely frustrated if they cannot understand what international students are trying to convey. Sometimes, international students use inaccurate expressions and words that fail to communicate the critical meaning of their ideas. This practice has been identified as a hindrance to faculty-student interaction. Yet, faculty-student interaction contributes to greater writing proficiency growth in international students and should be cultivated. Casanave (2014) added that expanding professors' awareness and understanding of the unique writing conventions in the different cultures would reduce professors' frustration with international students' writing skills.

2.4 Academic Effort

Astin (1993) explored the influence of writing ability among domestic students attending U.S. higher education institutions. He found that a number of college experiences were influenced by writing proficiency. According to Astin, writing proficiency is the single best predictor of cognitive learning, and writing proficiency predicts GPA as well. In addition, domestic students who are proficient writers are better critical thinkers and experience greater academic growth (Astin, 1993). If these findings are reflective of domestic students, one can justify their application to international students as well.

Of importance, therefore, was the recognition that academic effort, academic challenge, motivation, and academic involvement were important predictors of knowledge increase in international students (Grayson, 2008).

2.5 Summary

In summary, researchers have emphasized the significance of English writing ability as a contributor to cognitive growth, faculty-interaction, and academic effort of international students attending highly selective research universities (Andrade, 2006; Li et al., 2009; Lin & Yi, 1997). Students who struggle with English find writing essay exams and research papers extremely challenging (Mori, 2000) because these tasks are unfamiliar practices in other countries (Kuo, 2011). Yet, if international students are to flourish on U.S. campuses, writing research papers must be commonly practiced (Johnstone et al., 2002; VanLehn, 1996). Other challenges are under-developed cognitive functions, cultural differences in rhetorical conventions, schemata, and writing perspectives or expectations (Zhang & Mi, 2010). Each of these challenges affect cognitive growth, faculty-student interaction, and academic effort. However, these new literary skills must be cultivated if international students are to thrive on U.S. higher education campuses.

3. Method

The researcher sought to evaluate the writing proficiency of international students who were attending "very high research" institutions (according to Carnegie Standards [Retrieved from <https://carnegieclassifications.iu.edu/>]) as a predictor of cognitive skills development, faculty-student interaction, and elevated academic effort. Structural equation modeling (SEM), a confirmatory statistical procedure, was utilized to test the theory that writing proficiency is a predictor of cognitive development, faculty-student interaction, and academic effort among international students (Ullman & Bentler, 2012). SEM was used to explore the direct, indirect, and total effects of these relationships, both individually and collectively, and to test the model fit for predicting the impact of writing proficiency in a hypothesized structural regression model. SEM is especially appropriate to answer this question because this statistical methodology implements a hypothesis-testing, or confirmatory analysis approach (Byrne, 2010).

3.1 Data Source and Sample

The University of California Office of the President administers and manages the University of California Undergraduate Experience Survey (UCUES), which states its purpose as “solicit[ing] student opinions on a broad range of undergraduate students’ academic and co-curricular experiences, including instruction, advising, and student services” (<http://student.survey.universityofcalifornia.edu/>) and is administered every two years. The administrators of this office granted permission for the 2012 data to be used for this research study, of which only the core set of survey questions was utilized.

Of the 172, 873 students who participated in this survey, 7,637 or 4.4% were international students. Because the stated purpose of this submission was to examine writing proficiency as a predictor of cognitive skills development, faculty-student interaction, and academic effort, the study sample comprised only junior and senior international students. Furthermore, of this number, only 875 international students responded to the questions which would make the data consequential. Other insightful demographics were these: fifty-

four percent of this analytical sample were female, 9% were first-generation college students, and 7% learned to speak English after the age of 16.

3.2 Variables

The variables of interest for this submission were drawn from the comprehensive UCUES survey (see Table 1 for a list of the variables and their descriptive statistics).

Observed variable: The observed variable of particular interest to this researcher in the structural equation model was writing proficiency. International students were asked to self-assess their writing proficiency at the start of their tertiary career to determine its direct, indirect, and total effect on cognitive skills development, faculty-student interaction, and elevated academic effort by responding to this prompt: *Please rate your level of proficiency in the above areas* with a 6-point Likert scale (1 = *very poor*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*, 6 = *excellent*).

Latent variables: Each latent construct included in the structural equation model was measured by a set of *observed* variables. Observed or *manifest* variables are those that can be directly measured. These variables act as “indicators of the underlying construct which they are presumed to represent” (Byrne, 2010, p. 4.) Because the observed variables represent measurable data related to the latent variables, Byrne cautioned researchers to be prudent when selecting their measures of assessment. This researcher utilized confirmatory factor analysis to develop constructs that measured the latent variables of cognitive skills development, faculty-student interaction, and elevated academic effort.

A construct measuring international students’ self-reported, current cognitive skills abilities was developed ($\alpha = .84$). International students were asked to rate their abilities to (a) think analytically and critically, (b) read and comprehend academic material, (c) speak clearly.

Table 1. Means and Standard Deviations of the UCUES 2012 Questions (N = 875)

Item	Question	Mean*	SD
RUCCHLLNGCLSDIS	Contributed to class discussion	4.14	1.27
RUCCHLLNGDIFCLS	Brought up ideas or concepts from different courses during class discussions	3.67	1.29
RUCCHLLNGASKIN	Asked an insightful question in class	3.47	1.35
RUCCHLLNGINTRST	Found a course so interesting that you did more work than was required	3.79	1.28
RUCCHLLNGCOURSE	Chosen challenging courses, when possible, even though you might lower your GPA by doing so	4.14	1.33

RUCCHLLNGPRESN	Made a class presentation	3.29	1.48
RUCEXPLAIN	Explain methods, ideas, or concepts and use them to solve problems	4.93	0.92
RUCANALYZING	Break down material into component parts or arguments into assumptions to see the basis for different outcomes	4.61	1.01
RUCEVALUATION	Judge the value of information, ideas, actions, and conclusions based on soundness of sources, methods, and reasoning	4.53	1.08
RUCGENERATION	Create or generate new ideas, products, or ways of understanding	4.36	1.12
RUCUSEDFACTS	Used facts and examples to support your viewpoint	4.76	1.02
RUCSYNTHESIS	Incorporate ideas or concepts from different courses when completing assignments	4.40	1.10
RUCREXAMINED	Examined how others gathered and interpreted data and assessed the soundness of their conclusions	4.31	1.14
RUCREASSESS	Reconsidered your own position on a topic after assessing the arguments of others	4.35	1.10
RUCCHLLNGNAME	Had a class in which the professor knew or learned your name	3.68	1.44
RUCFCLTYSMNR	Taken a small research-oriented seminar	2.26	1.49

Table 1. Continued

Item	Question	Mean*	SD
RUCFCLTYCOMMUN	Communicated with a faculty member by email or in person	4.18	1.26
RUCFCLTYDISCEXT	Talked with the instructor outside of class about issues and concepts derived from a course	3.53	1.38
RUCFACLTYLECTURE	Interacted with faculty during lecture class sessions	3.31	1.37
RUCFACLTYYOTHACT	Worked with a faculty member on an activity other than coursework (e.g., student organization, campus committee, cultural activity)	2.43	1.53
*Above survey items used 6-point Likert scale (1 = never; 2 = rarely; 3 = occasionally; 4 = somewhat often; 5 = often; 6 = very often)			
RUCTIMEMOVIES	Attending movies, concerts, sports, or other entertainment events	2.57	1.11
RUCTIMECOMMSRV	Performing community service or volunteer activities	1.90	1.22
RUCTIMEEXERCISE	Participating in physical exercise, recreational sports, or physically active hobbies	0.55	1.14
RUCTIMESPIRIT	Participating in spiritual or religious activities	1.67	1.15
RUCTIMECLUB	Participating in student clubs or organizations	2.22	1.20
RUCTIMECREATE	Pursuing a recreational or creative interest (arts/crafts, reading, music, hobbies, etc.)	2.46	1.10
RUCTIMEPARTY	Partying	1.75	1.06

RUCTIMEFAMILY	Spending time with family	1.83	1.21
RUCTIMECMPTRNON	Using computer or smart phone for non-academic purposes (games, shopping, email, instant messaging, etc.)	3.87	1.66
RUCTIMETV	Watching TV	1.77	1.15

Table 1. Continued

Item	Question	Mean*	SD
RUCTIMESTUDY	Study and other academic activities outside of class	4.28	1.65
RUCTIMEFRIEND	Socializing with friends	3.16	1.22
*Above survey items used 8-point Likert scale (1 = 0 hours; 2 = 1–6 hours; 3 = 8–11 hours; 4 = 11–15 hours; 5 = 16–20 hours; 6 = 21–25 hours; 7 = 26–30 hours; 8 = more than 30 hours)			
RUCSKILLCRIT_CRITT1	Analytical and critical thinking skills (when you started here)	3.49	1.01
RUCSKILLWRITE_WRITET1	Ability to be clear and effective in writing (when you started here)	3.20	1.00
RUCSKILLREAD_READT1	Ability to read and comprehend academic material (when you started here)	3.44	0.97
RUCSKILLMJR_MJRT1	Understanding of a specific field of study (when you started here)	3.46	0.98
RUCSKILLSPEAK_SPEAKT1	Ability to speak clearly and effectively in English (when you started here)	3.71	1.19
RUCSKILLCRIT_CRITT2	Analytical and critical thinking skills (current ability level)	4.30	0.88
RUCSKILLWRITE_WRITET2	Ability to be clear and effective in writing (current ability level)	4.11	0.93
RUCSKILLREAD_READT2	Ability to read and comprehend academic material (current ability level)	4.28	0.88
RUCSKILLMJR_MJRT2	Understanding of a specific field of study (current ability level)	4.48	0.97
RUCSKILLSPEAK_SPEAKT2	Ability to speak clearly and effectively in English (current ability level)	4.42	0.97
*Above items used a 6-point Likert scale (1 = very poor; 2 = poor; 3 = fair; 4 = good; 5 = very good= 6 = excellent)			

Table 1. Continued

Item	Question	Mean*	SD
RUCSKILLCRIT_CRITT1	Analytical and critical thinking skills (when you started here)	3.49	1.01
RUCSKILLWRITE_WRITET1	Ability to be clear and effective in writing (when you started here)	3.20	1.00
RUCSKILLREAD_READT1	Ability to read and comprehend academic material (when you started here)	3.44	0.97
RUCSKILLMJR_MJRT1	Understanding of a specific field of study (when you started here)	3.46	0.98
RUCSKILLSPEAK_SPEAKT1	Ability to speak clearly and effectively in English (when you started here)	3.71	1.19
RUCSKILLCRIT_CRITT2	Analytical and critical thinking skills (current ability level)	4.30	0.88
RUCSKILLWRITE_WRITET2	Ability to be clear and effective in writing (current ability level)	4.11	0.93
RUCSKILLREAD_READT2	Ability to read and comprehend academic material (current ability level)	4.28	0.88
RUCSKILLMJR_MJRT2	Understanding of a specific field of study (current ability level)	4.48	0.97
RUCSKILLSPEAK_SPEAKT2	Ability to speak clearly and effectively in English (current ability level)	4.42	0.97
*Above items used a 6-point Likert scale (1 = very poor; 2 = poor; 3 = fair; 4 = good; 5 = very good; 6 = excellent)			
Gen_recode	Recoded: 1 = female; 2 = male	1.55	0.50
RUCSOCIAL CLASS	Coded: 1 = wealthy; 2 = upper-middle or professional-middle; 3 = middle-class; 4 = working class; 5 = low-income or poor	2.83	0.81
RUCAGEENGLISH	Coded: 1 = English is my native language ; 2 = before I was 5 years old; 3 = 6–10 years old; 4 = 11–15 years old; 5 = after turning 16 years old	3.08	1.00
ALIEN_RECODE	Recoded: 1 = yes; 0 = no College	1.00	1.00

Table 1. Continued

Item	Question	Mean*	SD
Partoted	Parents attended college (Recoded: 0 = no; 1 or more = yes)	1.79	0.78
gpare	Recoded: 0 = lower than 2.0; 1 = 2.01–3.00; 2 = 3.01–4.00; 3 = 4.01–5.00	2.21	0.48
Writ_prof	Writing proficiency when entered College	17.3	4.12

Note. * Items not depicted in hypothesized structural equation model.

and effectively in English, and (d) understand a specific field of study by responding to the following question: *Please rate your level of proficiency in the above areas* with a 6-point Likert scale (1 = *very poor*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*, 6 = *excellent*).

To measure the academic effort, academic challenge, motivation, and academic involvement, the Elevated Academic Effort construct was utilized ($\alpha = .83$). International students were asked how often they (a) contributed to class, (b) brought up ideas or concepts from different courses during class (c) asked an insightful question in class, (d) found a course so interesting that they did more work than was required, (e) chosen challenging courses, and (f) reconsider their own position on a topic after assessing the arguments of others. To measure this construct, students answered the items by using the following 6-point Likert scale: 1 = *never*; 2 = *rarely*; 3 = *occasionally*; 4 = *somewhat often*; 5 = *often*; 6 = *very often*.

The faculty-student interaction scale asked international students how frequently they (a) had a class in which the professor knew or learned their names, (b) communicated with a faculty member by email or in person, (c) talked with the instructor outside of class about issues and concepts derived from a course, (d) interacted with faculty during lecture class section, (e) worked with a faculty member on an activity other than coursework, and (f) taken a small research-oriented seminar with faculty. International students responded by using the following 6-point Likert scale: 1 = *never*; 2 = *rarely*; 3 = *occasionally*; 4 = *somewhat often*; 5 = *often*; 6 = *very often*.

3.3 Analysis

Adhering to the recommendations of Tabachnick and Fidell (2007), the data were screened and cleaned. Then, because structural equation modeling (a very powerful multivariate and confirmatory technique) was the chosen methodology of this research study, and because missing data invalidate the model, an analysis of missing data was conducted. The Missing Value Analysis (MVA) function of SPSS 22.0 was utilized to eliminate the likelihood of patterns and increase the validity of the structural equation model. To graph the study's underlying theoretical and final models, the researcher utilized Amos 22 software (see Figure 1).

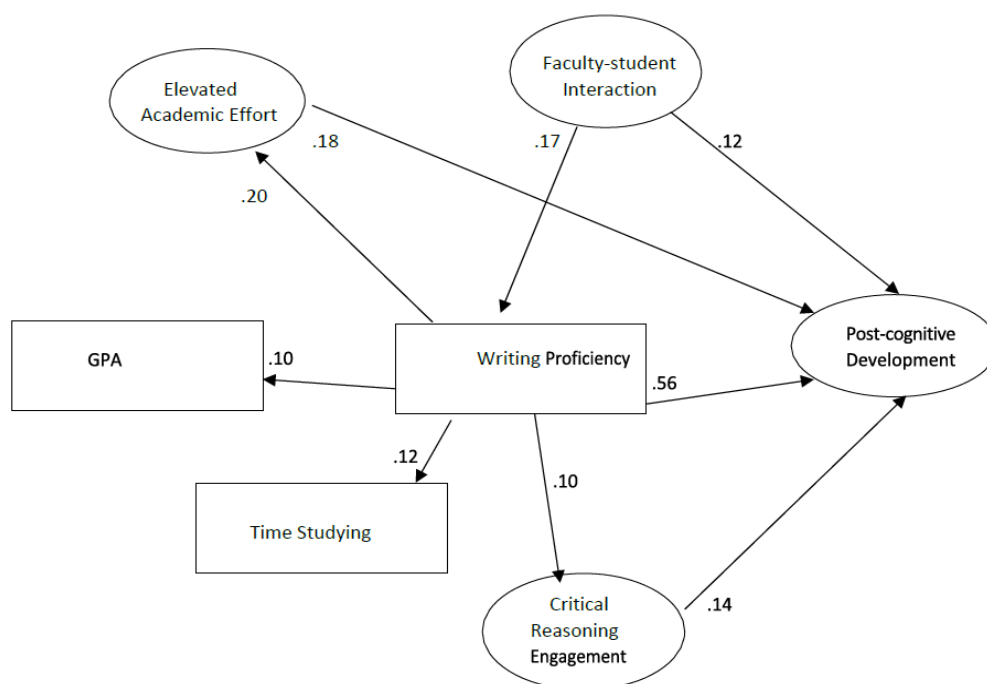


Figure 1. Direct Effects of Observed and Latent Variables on Post-cognitive Development. Also Shown are the Direct Effects of Writing Proficiency on Observed and Latent Variables

4. Results

Because the UCUES survey provided much rich data related to international students attending high research institutions, the researcher explored more than cognitive skills development, faculty-student interaction, and elevated academic effort. Additional constructs were included in the hypothesized structural equation model that could deepen the understanding of higher education individuals of international students. However, for the purposes of this submission, only the observed variable (writing proficiency) and latent variables (cognitive skills development, elevated academic effort, and faculty-student interaction) were reported in the findings below. After trimming the initial structural equation model, the final structural equation model exhibited these excellent goodness-of-fit statistics: [$\chi^2 = 1220.768$ ($df = 540$, $p < .001$), PGFI = .751, PCFI = .816, CFI = .952 (comparative fit index: $> .90$ indicates good fit), RMSEA = .038 (root mean square error of approximation: $\leq .05$ indicates good fit), CMIN/DF = 2.261 (relative chi-square: < 3.0 indicates good fit), and CAIC = 2200.321].

The latent variables most impacted by the writing proficiency of international students were cognitive skills development (standardized total effect = .638, $p < .001$), elevated academic effort (standardized total effect = .214, $p = .001$), and faculty-student interaction (standardized total effect = .188, $p < .001$). Thus, the focus on these three latent variables was justified.

5. Discussion

This researcher has suggested that the writing proficiency of international students attending highly selective higher education institutions in the United States impacts cognitive skills development, faculty-student interaction, and elevated academic effort (see Table 1 above for the comprehensive list of UCUES (2012) items associated with this research study).

Table 2. Standardized Direct, Indirect, and Total Effects of Writing on Latent and Observed Variables

Variable	Direct Effect	Indirect Effect	Total Effect
Time Studying	0.115	0.000	0.115
First-generation Status	0.085	0.000	0.085
High School GPA	0.105	0.000	0.105
Gender	0.000	0.000	0.000
Elevated Academic	0.201	0.013	0.214
Critical Reasoning Engagement	0.109	0.017	0.126
Extracurricular Engagement	0.114	0.019	0.133
Faculty-Student Interaction	0.168	0.019	0.188
Cognitive Skills Development	0.559	0.079	0.638

By evaluating the paths of writing proficiency to the latent constructs, the researcher noted its significant impact on cognitive skills development ($R^2 = .638$), which confirmed the findings of Andrade (2006), Li et al. (2009), and Lin and Yi (1997). Writing proficiency is linked closely to cognitive development and academic achievement (see Table 2).

The path from writing proficiency to elevated academic effort was also of interest ($R^2 = .214$) to the researcher. Because the items within this construct required proficient English listening and speaking skills, one can justify that writing proficiency was closely linked to this latent construct. Although no surprise, this connection suggests that international students have invested high levels of academic effort to become proficient writers. One explanation for this significant academic effort might be the international students' intention to qualify for acceptance to U.S. higher education institutions, which are magnets for foreign talent (Batalova, 2007).

Finally, the path from writing proficiency to faculty-student interaction proved noteworthy (standardized total effect = .188). Those students who were proficient in writing were sought after more often for faculty-student collaboration. This finding has been confirmed by other researchers (Casanave, 2014; Zhang & Mi, 2010), and is explained as a lack understanding by domestic professors of the writing challenges faced by international students. Hence, these professors will seek proficient international writers with whom to collaborate on their research projects (Zhang & Mi, 2010.) Avoidance of collaboration hinders optimal academic achievement and cognitive skills development among international students.

In summary, the entry level of writing proficiency had the greatest impact upon the cognitive skills development construct. As hypothesized, also affected by the international students' entry level of writing proficiency were the latent constructs of elevated academic reasoning and faculty-student interaction.

6. Implications

Increasing the understanding of higher education leaders regarding the importance of international students' writing proficiency was the focus of the above discussion. Because international students have identified optimal academic achievement and increased critical thinking ability as their primary goals, the most important implication of this study was the identification of writing proficiency as the largest contributing variable to cognitive skills development, elevated academic achievement, and faculty-student interaction, which has been linked to the above goals. Confirming the work of many researchers, pre-college writing must be proficient for international students to thrive at U.S. higher education institutions (Andrade, 2006; Li et al., 2009; Lin & Yi, 1997). The provision of student support programs that address writing proficiency issues will assist international students in accomplishing their educational goals and achieving academic success.

A second implication of this study confirmed the work of other researchers who have found that expressing oneself well in writing involves a number of cognitive functions (Johnstone et al., 2002; Zhang & Mi, 2010). High levels of writing proficiency require the cognitive skills of planning, synthesizing, organizing, composing, and revising (Zhang & Mi, 2010). Furthermore, the ability to articulate and establish a position on a problem cannot be executed without well-developed cognitive abilities (Johnstone et al., 2002). The addition of class assignments which cultivate cognitive functions will encourage international students' growth not only in critical thinking but also in expressing themselves in writing.

Because many international students have not been exposed to the same decision-making opportunities as domestic students, a third implication of this study was the need for addressing cognitive deficits to improve academic skills such as writing proficiency (Zhang, 1999). Prior to coming to the United States for their tertiary education, international students were accustomed to solving problems through analogy and paraphrase (Egege & Kutieleh, 2004). Straight lecture was the preferred pedagogy of many of their educational systems, and international students arrive inexperienced in cognitive reasoning (Zhang, 1999). International students must be given opportunities to think complexly and to evaluate multiple perspectives if critical reasoning is to be cultivated (Glass, 2012) and improved writing proficiency is to occur.

The approaches below address the challenges created by inadequate pre-college writing proficiency among international students coming to highly selective institutions in the United States. First, additional language support needs to be provided. The relationship among English proficiency, faculty-student interaction, elevated academic effort, and cognitive growth has been established above. Second, higher education faculty and staff must be better informed of the pedagogical differences among the United States and the home countries of international students. Educational systems and learning styles as well as teaching approaches differ depending from which country the international student originated. There are prominent differences in rhetorical conventions, cultural schemata, and writing expectations among cultures (Casanave, 2014; Connor, 2002; Crusan, 2010; Lindsey & Crusan, 2011; Zhang & Mi, 2010). The end result will be improved relationships among professors and international students. Third, class professors must add additional focus on critical thinking to their classes, which will benefit both domestic and international students alike. This additional focus will

cultivate cognitive growth, which encourages more skilled writing.

Despite the provision of the above student supports for international students, the process of improving writing and cognitive growth is slow and steady (King & Kitchener, 1994; Magolda, 1992; Perry, 1968, 1970, 1981). Higher education leaders must encourage U.S. professors to provide opportunities for their students to practice complex thinking and problem solving so that they can develop well-written arguments (Glass, 2012). Intentional feedback must be given as well so that international students can experience cognitive growth and improved writing skills. As King (2009) emphasized, international students will return to the learning styles cultivated in their more authoritarian educational systems if increased opportunities are not offered to stimulate their critical thinking and to improve their ability to construct a logically written argument (Casanave, 2014; Connor, 2002; Crusan, 2010; Lindsey & Crusan, 2011; Zhang and Mi, 2010).

7. Limitations

The most obvious limitation of this research study was the absence of a question on the UCUES 2012 Survey which identified the home country of international students. Participants were asked only if they were a resident or a non-resident of the United States. Greater understanding of the international student population would have resulted if the home countries had been identified as well as the unique experiences and educational systems. Researchers have suggested that international students coming from different countries and cultures may represent differing direct and indirect causal paths among the latent constructs, observed variables (including writing proficiency), and cognitive skills development (Kim & Sax, 2009; Lee & Rice, 2007). The focus of the UCUES 2012 Survey was primarily on domestic students, so grouping international students as a small subset of a much larger survey was justified. International students comprised only 7,637 students of the 172,873 students.

Not unusual for most research studies, other limitations emerged. Confirming the data of the UCUES 2010 Survey, the statistical reliability of the UCUES 2012 Survey was compromised by the difference in size between the international and domestic student populations. Authors (2015) have noted that statistical reliability is problematic when one population is smaller than another. Hence, the findings are less robust for the 7,637 international students than it is for the 172,873 domestic students.

Because the UCUES Survey is only administered every two years, the missing years result in less data and constitute another limitation. More data would have resulted in greater understanding among higher education leaders of the needs of international students. Determining the appropriate support and intensity of tutelage can be difficult without adequate data to justify the establishment of student support programs.

Another limitation of this research study was its primary focus on writing proficiency and cognitive skills development as major contributors to academic achievement. Many other factors could have encouraged academic achievement and critical thinking growth. Hence, more comprehensive exploration of all contributing factors to academic excellence should be undertaken to assist international students in the attainment of their educational goals.

The applicability of the findings to U.S. higher education institutions is still another limitation of this research study. Because the data was gathered from students attending highly selective higher education research institutions in the Western United States, these findings may not be applicable to those higher education institutions with a teaching focus rather than a research focus or in other parts of the country.

Finally, another limitation is the survey instrument itself. When constructing a survey, the researcher selects the variables to be explored; other variables that could impact the dependent variable are discarded. Surveys also rely on self-reported data. Concerned researchers have reported that self-reported data may not be reliable because students' answers may not be trustworthy (Kuh, 2001). In addition, relevant to this particular study is Johnstone's et al. (2002) caveat: "Cognitive processes . . . are inherently difficult to measure" (p. 305). Hence, despite the validity and reliability of the UCUES 2012 survey items, the accuracy of the international students' responses must be questioned.

8. Future Research

Reiterating what was stated above, those experiences that affect the international students' ability to accomplish their educational goals at U.S. higher education institutions need additional exploration. According to the Migration Policy Institute (2018, May), the United States remains the top destination for international students because of its "quality higher education system, welcoming culture, and relatively open labor market" (para. 1). Higher education leaders are concerned, however, because "the U.S. share of globally mobile students dropped from 28 percent in 2001 to 24 percent in 2017" (para. 1). Despite the percentage drop, "the overall number of international students more than doubled in the same period" (para.1). If the stream of international students is to continue, student supports that ensure the educational success of international students must be implemented. Hence, identification of the international students' critical needs warrants more intentional research focus.

9. Conclusion

U.S. higher education college and university admissions personnel are actively recruiting international students from all over the world to complete their tertiary educations at their institutions. Because degrees from these universities are recognized worldwide as valuable and prestigious, large numbers of international students leave their home country and come to the United States to study. Every effort should be undertaken by U.S. higher education leaders to ensure that international students achieve their educational aspirations and the level of academic excellence so highly sought.

References

- Al-Sharideh, K. A., & Goe, W. R. (1998). Ethnic communities within the university: An examination of factors influencing the personal adjustment of international students. *Research in Higher Education*, 39, 699-725.
- Altbach, P. (2004). Can the United States remain the top destination for foreign students? *Change*, 36(2), 18-24.
- Altbach, P. G. (1989). The new internationalism: Foreign students and scholars. *Studies in Higher Education*, 14(2), 125-136. doi.org/ 10.1080/ 0307507891233137746
- Andrade, M. S. (2006). International students in English-speaking universities: Adjustment factors. *Journal of Research in International Education*, 5(2), 131-154.
- Arkoudis, S. (2006). Teaching international students: *Strategies to enhance learning*. Melbourne, Australia: Centre for the Study of Higher Education, University of Melbourne.
- Astin, A. W. (1993). *What matters in college?* San Francisco, CA: Jossey-Bass Publishers.
- Banjong, D. N., & Olson, M. R. (2016). Issues and trends of international students in the United States. *International Journal of Education*, 4(1), 1-14.
- Batalova, J. (2007, January 1). The "brain gain" race begins with foreign students. *Migration Policy Institute*. Retrieved from <http://www.migration.org/article/%E2%80%9Cbrain-gain%E2%80%9D-race-begins-foreign-students>
- Bista, K., & Foster, C. (2011). Issues of international student retention in American higher education. *The International Journal of Research and Review*, 7(2), 1-10.
- Casanave, C. (2004). Controversies in second language writing: Dilemmas and decisions in research and instruction. Ann Arbor: University of Michigan Press.
- Chevalier, A. (2014). *How to attract foreign students*. Retrieved from <http://wol.iza.org/articles/how-to-attract-foreign-students>
- Connor, I. (2002). New directions in contrastive rhetoric. *TESOL Quarterly*, 36(4), 493-510.
- Crusan, D. (2010). Assessment in the second language writing classroom. Ann Arbor: University of Michigan Press.

- de Guzman, M. R. T, Durden, T. R., Taylor, S. A., Guzman, J. M., & Potthoff, K. L. (2016, February). Cultural competence: An important skill for the 21st century. *Neb Guide*. Retrieved from <http://extensionpublications.unl.edu/assets/html/g1375/build/g1375.htm>
- Dongfeng, L. (2012). Culture shock and its implications for cross-cultural training and culture teaching. *Cross-Cultural Communication*, 8(4), 70-74. doi: 10.3968/j.ccc/1923670020120804.1433
- England-Siegerdt, C. Draft 2013 national tuition and fee report. Retrieved from <http://www.wsac.wa.gov/sites/default/files/TuitionFeeReport-DRAFT.pdf>
- Garcia, H. A., & de Lourdes Villarreal, M. (2014). The “redirecting” of international students: American higher education policy hindrances and implications. *Journal of International Students*, 4(2), 126-136.
- Grapevine Project (2014). One-year (FY12-FY13), two-year (FY12-14), and five-year (FY09-FY14) percent changes in state fiscal support for higher education.
- Hechanova-Alampay, R., Beehr, T. A., Christiansen, N. D., & Van Horn, R. K. (2002). Adjustment and strain among domestic and international student sojourners: A longitudinal study. *School Psychology International*, 23, 458-474.
- Hegarty, N. (2014). Where we are now—the presence and importance of international students to universities in the United States. *Journal of International Students*, 4(3), 223-235.
- Heggins, W. J., & Jackson, J. F. L. (2003). Understanding the collegiate experience for Asian international students at a midwestern research university. *College Student Journal*, 37, 379-391.
- Hesel, R. A. (2012). *Definitive study of college-bound students in China*. Retrieved from Art & Science Group, LLC website: http://www.artsci.com/StudentPOLL_China/v1n1index.aspx
- Jenkins, H. M. (1983). Growth and impact of educational interchanges. In H. M. Jenkins, & Associates (Eds.), *Educating students from other nations* (pp. 4-30). San Francisco, CA: Jossey-Bass Publishers.
- Johnstone, K. M., Ashbaugh, H., & Warfield, T. D. (2002). Effects of repeated writing practice and contextual-writing experiences on college students’ writing skills. *Journal of Educational Psychology*, 94, 305-315. doi:10.1037/0022-0663.94.2.305
- Khanal, J., & Gaulee, U. (2019). Challenges of international students from pre-departure to post-study: A literature review. *Journal of International Students*, 9(2), 560-581.
- Kuo, Y-H. (2011). Language challenges faced by international graduate students in the United States. *Journal of International Students*, 1(2), 38-42.
- Lee, J. J., & Rice, C. (2007). Welcome to America? International student perceptions of discrimination. *Higher Education*, 53, 381-409. doi:10.1007/s10734-005-4508-3
- Lee, J. L. (2010). International students’ experiences and attitudes at a US host institution: Self-reports and future recommendations. *Journal of Research in International Education*, 9(66), 66-84.
- Li, G., Chen, W., & Duanmu, J-L. (2009). Determinants of international students’ academic performance: A comparison between Chinese and other international students. *Journal of Studies in International Education*, 14, 389-405.
- Li, R. Y., & Kaye, M. (1998). Understanding overseas students’ concerns and problems. *Journal of Higher Education Policy and Management*, 20(1), 41-50. doi.org/10.1080/1360080980200105
- Lin, A. M. Y. (1999, Autumn). Doing-English-lessons in the reproduction or transformation of social worlds? *TESOL Quarterly*, 33, 393-412.
- Lindsey, P., & Crusan, D. (2011, December 21). How faculty attitudes and expectations toward student nationality affect writing assessment. *Across the Disciplines*, 8(4), 1-35.

- Mahmood, H. (2014). *An analysis of acculturative stress, sociocultural adaptation, and satisfaction among international students at a non-metropolitan university* (unpublished doctoral dissertation). Western Kentucky University, Bowling Green, KY.
- Mamiseishvili, K. (2012). International student persistence in U.S. postsecondary institutions. *Higher Education*, 64, 1-17.
- Martirosyan, N., Hwang, E., & Wanjohi, R. (2015). Impact of English proficiency on academic performance of international students. *Journal of International Students*, 5(1), 60-71.
- Matthews, D. (2017, April 27). Why Germany educates students for free. *Inside Higher Ed*. Retrieved from <http://www.insidehighered.com/news/2017/4/27/germany-sees-benefits-education-international-students-free>
- Moore, K. A., Rutherford, C., & Crawford, K. A. (2016). Supporting postsecondary English language learners' writing proficiency using technological tools. *Journal of International Students*, 6(4), 857-872.
- Mori, S. (2000, Spring). Addressing the mental health concerns of international students. *Journal of Counseling & Development*, 78, 137-144.
- NAFSA: Association of International Educators (2016). *New NAFA data: International students contribute \$21.8 billion to the U.S. economy*. Retrieved from [http://nafsa.org/About_Us/About_NAFSA/Press/New_NAFSA_Data__International_Students_Contribute_\\$32_8_Billion_to_the_U_S__Economy/](http://nafsa.org/About_Us/About_NAFSA/Press/New_NAFSA_Data__International_Students_Contribute_$32_8_Billion_to_the_U_S__Economy/)
- Open Doors Report. (2017). *Open Door fast facts*. Retrieved from <http://www.iie.org/Opendoors>
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students (vol. 2): A third decade of research*. San Francisco, CA: Jossey-Bass Publishers.
- Redden, E. (2013b). *Inside higher ed: Foreign student dependence*. Retrieved from <http://www.timeshighereducation.com/news/inside-higher-ed-foreign-studentdependence/2005782>.
- Ruiz, N. G. & Budiman, A. (2018, May 10). *Federal training program sees 400% increase in foreign students graduating and working in STEM fields from 2008 to 2016*. Retrieved from <http://www.pewglobal.org/2018/05/10/number-of-foreign-college-students-staying-and-working-in-u-s-after-graduation-surges/>
- Safipour, J., Wenneberg, S., & Hadziabdic, E. (2017). Experience in education in the International classroom – A systematic literature review. *Journal of International Students*, 7(3), 806-824.
- Shih, K. Y. (2015). The impact of international students on U.S. graduate education. Retrieved from http://kevinyshih.weebly.com/uploads/5/5/8/7/5587146/shih_jmp_1_7_2015.pdf
- Singh, M. (2015). International graduate students' academic writing practices in Malaysia: Challenges and solutions. *Journal of International Students*, 5(1), 12-22.
- Terenzini, P., Pascarella, E. T., & Blimling, G. S. (1996). Students' out-of-class experiences and their influence on learning and cognitive development: A literature review. *Journal of College Student Development*, 37(2), 149-162.
- Trice, A. G. (2003). Faculty perceptions of graduate international students: The benefits and the challenges. *Journal of Studies in International Education*, 7, 379-403.
- VanLehn, K. (1996). Cognitive skill acquisition. *Annual Review of Psychology*, 47, 513-539.
- Why are international collaborations so important for universities? (2018, August 23). *QS*. Retrieved from <http://www.qs.com/why-are-international-collaborations-so-important-for-universities>
- Zhang, Y., & Mi, Y. (2010). Another look at the language difficulties of international students. *Journal of Studies in International Education*, 14, 371-388.