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by

Dina Ghazzawi

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RE-CONCEPTUALIZING STUDENT ENGAGEMENT: INVESTIGATING THE  
VALIDITY OF CCSSE BENCHMARKS AS PREDICTORS OF ACADEMIC  
ACHIEVEMENT AND SENSE OF BELONGING AMONG INTERNATIONAL  
STUDENTS

A Dissertation Presented to the  
Faculty of the College of Education  
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In Partial-Fulfillment  
of the Requirements for the Degree

Doctor of Philosophy in Higher Education  
Leadership and Policy Studies

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## Abstract

**Background:** In recent years, community colleges have witnessed an influx of international students. During the 2017-2018 academic year 94,562 international students studied in U.S. community colleges, representing 9.1% of total international enrollment in the U.S. Studies highlight the numerous challenges faced by international students, including homesickness, language barriers, culture shock, and discrimination. Despite these challenges, few studies investigate the engagement experiences of international students in community colleges. **Purpose:** This study investigated how international students engage in educationally purposeful activities, and how such engagement impacts their academic achievement and sense of belonging. Specifically, the study addressed the following research questions: 1) What are the socio-demographic, pre-college, and academic characteristics of international students studying at U.S. community colleges?; 2) To what extent are the five benchmarks of effective educational practices from the Community College Survey of Student Engagement (CCSSE) valid constructs of international student engagement in the community college context?; 3) What is the relationship between the five CCSSE benchmarks and the academic achievement of international students?, and; 4) What is the relationship between the five CCSSE benchmarks and the sense of belonging of international students? **Methods:** The data used for this quantitative study was obtained from the Community College Survey of Student Engagement, containing a 25% random sample of a three-year cohort of students located in 47 states (n = 107,429) beginning in Fall 2013. International students represent 6.1% of the sample (n=6,739). Background and pre-college characteristics, engagement benchmark scores, GPA and sense of belonging scores were examined using the

International Student Engagement Model as a guiding conceptual framework. Data analysis for the first research question included descriptive statistics, including means, standard deviations, proportional distributions and frequencies. Exploratory and confirmatory factor analyses were used to answer the second research question to establish the five-factor structure of the CCSSE model. A multinomial logistic regression was employed to answer the third research question to examine the relationship between engagement benchmarks and academic achievement. The final research question used a multivariate regression analysis to identify the variables significantly related to sense of belonging. **Results:** Data reduction analysis indicated that the original CCSSE benchmarks were a poor fit of the data for international students. Factor analysis yielded constructs with underlying items considerably different to those in the original CCSSE structure. Parental financial support, student effort, academic challenge, and environmental support were significant positive predictors of higher GPA scores among international students. Regression results found that environmental support was the strongest predictor of international students' sense of belonging in general, while active and collaborative learning was a negative predictor of sense of belonging with faculty. **Discussion and Implications:** Findings highlight the role of environmental support on the sense of belonging of international students. Recommendations focus on building more inclusive campus climates for international students through stronger intercultural training of faculty and staff. Encouraging international students to participate in class through online discussion forums, peer mentoring programs, and increased efforts from academic advisors also assist in promoting greater sense of belonging among international students.

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## **Chapter I**

### **Introduction**

Since the early 19<sup>th</sup> century, international students have been migrating to the United States in increasing numbers (Bevis & Lucas, 2007). Drawn to the rich variety of academic programs, quality of education and friendly culture, students have received opportunities that were not available to them in their home countries (Altbach, 2004; Guruz, 2011). Currently, the U.S. is the leading choice of international students in the world, hosting over one million students (Institute of International Education, 2018). As our world becomes increasingly globalized, social and political factors are inducing higher education institutions towards more active recruitment and interest in international students (Garcia & Villarreal, 2014). These factors include the recent cuts in educational funding that have propelled institutions to look for other sources of income, as well as the increased emphasis on the benefits of diversifying campuses on the cognitive development of students (Gurin, Dey, Hurtado, & Gurin, 2002; Jayakumar, 2008; Treat & Hagedorn, 2013). Simultaneously, globalization has also contributed to the increased mobility of students as they select higher education institutions, adding to the influx of international students to the U.S. (Bevis & Lucas, 2007).

Several push-pull factors contribute to the decision of international students to leave their home countries in search of postsecondary education abroad (Altbach, 2004). Sometimes, international students are pushed out when their home countries lack the educational options that are compatible with their academic, social and economic needs, a pattern more prevalent in less developed countries (Altbach, 2004). Less developed countries also have limited resources and capacity to accommodate the student demand

for postsecondary education (Altbach, Reisberg & Rumbley, 2009), especially in China and India, currently the largest sending nations of international students to the U.S. (Institute of International Education, 2018). Consequently, students are pulled towards countries that offer more distinguished institutions with rich resources and program variety to match their academic and career needs (Garcia & Villarreal, 2014). Due to the fact that the U.S. contains the majority of the world's renowned postsecondary institutions, it is no surprise that it attracts the largest number of international students annually (Institute of International Education, 2018). Furthermore, the prestige associated with attending a U.S. institution constitutes a large return on investment for international students because it allows them to gain the social and cultural capital that will boost their job prospects upon returning to their home country (Garcia & Villarreal, 2014; Lee, Maldonado-Maldonado, & Rhodes, 2006).

A large body of research demonstrates the positive learning outcomes associated with interacting with a diverse student population both for domestic and international students (e.g., Chen, 1999, Gurin, Dey, Hurtado, & Gurin, 2002, Jayakumar, 2008). These effects include increased critical thinking skills, cultural awareness, leadership skills, and civic development. Besides the positive learning outcomes associated with interacting with international students, international students can also help their domestic peers build social networks across borders, providing valuable connections between institutions and faculty across the world (Quaye & Harper, 2014). Research has also documented the various benefits that international students offer to the U.S. (e.g. Anayah, 2012; Barnett, Lee, Jiang, & Park, 2016; Quaye & Harper, 2014). Firstly, with the current emphasis on internationalization in higher education, international students are a central

component in promoting global understanding and cultural sensitivity (Barnett, Lee, Jiang, & Park, 2016; Jennings, 2017). The presence of international students in classrooms and across campuses adds diversity in worldviews, cultures, politics, and language (Anayah, 2012; Bevis, 2002; Garcia & Villareal, 2014), and such diversity equips domestic students with the social and conceptual tools to function in an increasingly multicultural workforce (Jayakumar, 2008).

Research on higher education has also highlighted the financial benefits of hosting international students. In 2017-2018, international students contributed over \$39 billion to the U.S. economy in tuition and fees, supporting approximately half a million jobs (NAFSA: Institute of International Education, 2018). With the recent decrease in federal funding and budget cuts for higher education, U.S. colleges and universities look to international students as a significant source of revenue since international tuition is considerably higher than what both universities and colleges charge their in-state students (Rampell, 2018). Realizing the vast economic and cultural contributions that international students have to offer, many U.S. postsecondary institutions have undertaken stronger efforts in recruiting these students. More active recruitment efforts, coupled with the various factors that propel international students to leave their home countries, have contributed to the rise of international student enrollment by 75% in U.S. colleges and universities during the past decade (Institute of International Education, 2018).

In addition to the increase in enrollment of international students in four-year institutions, community colleges have also witnessed an influx of international students (Dozier, 2001; Garcia, Li, McNautan, Leong, Eicke, & McClain, 2018; Zhang, 2017). According to a recent analysis, 94,562 international students studied in U.S. community

colleges during the 2017-2018 academic year, representing 9.1% of total international enrollment in the U.S. (NAFSA, 2018). The increase in representation of international students at community colleges was initiated in part during the 1970s, following several expansion and internationalization initiatives in response to reports that these colleges were not preparing students in areas of global awareness and cultural competence (Garcia et al., 2018). As community colleges added international education to one of their core missions in the early 2000s, more active efforts were undertaken in the recruitment of international students (Raby & Valeau, 2007). These active recruitment efforts informed international students about features of community colleges that were more appealing to them than some four-year universities. Essentially, community colleges fulfill a vital mission in providing open-access education to students from a multitude of cultures, educational backgrounds, and ethnicities (Cohen, Brawer, & Kisker; 2014). Given their diverse student populations, community colleges may present a more welcoming environment for international students than four-year universities, allowing them to interact with students that may share their unique experiences and facilitate their adjustment to the new educational environment (Evelyn, 2005; Glass & Westmont, 2013; Montgomery & McDowell, 2009).

Furthermore, while tuition and fees at community colleges are much more affordable than four-year institutions, international students still face much higher tuition than domestic students and are required to enroll full-time due to visa stipulations (Bohman, 2014; Fernandez, 2015). Community colleges, nonetheless, are a more cost-effective route to postsecondary education than four-year institutions for international students (Anayah & Kuk, 2015; Hagedorn & Lee, 2005). Research shows that many

international students who choose to enroll in community colleges come from middle class families who try very hard to support their children while abroad and would not have been able to afford tuition at a four-year institution (Anayah & Kuk, 2012).

Community colleges, therefore, present a viable option for international students and families from lower socio-economic backgrounds (Anayah & Kuk, 2015).

Finally, community colleges offer an increased emphasis on building English language skills, an issue with which many international students struggle (Kegel, 2009; Zhang & Brunton, 2007). Language barriers can negatively impact international students' interactions with peers, faculty, and staff (Chen, 1999). Four-year institutions typically require students to pass an English language proficiency examination as a condition for admittance (Baily & Weininger, 2002). Both the access and admission to community colleges is easier for international students because of the less stringent admission rules (Anayah & Kuk, 2015). Community colleges also offer remedial English classes that can assist international students in improving their language skills, helping them overcome language barriers and demonstrate the full scope of their academic potential (Blumenthal, 2002).

Despite the rapid proliferation of international students into U.S. community colleges, limited research examines their academic and social experiences and their outcomes in this specific sector of higher education. The majority of research surrounding international students focuses on their experiences in four-year institutions (e.g. Glass, Kociolek, Wongtrirat, Lynch, & Cong, 2015; Hendrickson, Rosen, & Aune, 2011; Zhao, Kuh, & Carini, 2005). Though it is important to study the experiences of international students in the four-year setting, researchers have emphasized the need to

advance empirical research on international students in the community college sector (Hagedorn & Lee, 2005; Zhang, 2017). This is particularly important as the characteristics of international students and the factors contributing to their enrollment at community colleges are considerably different from those who enroll in four-year institutions. Research demonstrates that international students who enroll in community colleges would not come to the U.S. under normal circumstances since many dropped out of university in their home countries (Anayah & Kuk, 2015). Community colleges offer these students a second chance to pursue a postsecondary education that they would not have otherwise had access to since many of them also come from middle class families without sufficient funds to afford tuition in a four-year institution. The community college, for these students, is one of the only viable option to gain a post-secondary education abroad because it offers them a pathway to a four-year institution (Hagedorn & Lee, 2005; Zhang, 2017). Research studies have demonstrated that the majority of international students enrolled at community colleges intend to transfer to four-year institution (Bevis & Lucas, 2007; Bohman, 2010; Hagedorn & Lee, 2005), providing evidence of the importance of community colleges as stepping stones for international student transfer and bachelor's degree attainment (Bohman, 2010).

Despite the various benefits that community colleges offer to international students, limited research examines their academic and social experiences in this educational setting (Zhang, 2017). Understanding the experiences of international students in community colleges is particularly critical as these students have increased stressors and challenges adapting to life in a new country as well as a new learning environment (Smith & Khawaja, 2011). Among these challenges, language barriers,



homesickness, loneliness, and culture shock are the most frequently mentioned in the literature concerning international student experiences in the U.S. (Chen, 1999; Furnham & Alibhai, 1985; Smith & Khawaja, 2011; Yeh & Inose, 2003). The challenges and unique experiences of international students could differentiate the nature of their educational experiences in community colleges as well as the way in which they engage with different aspects of their college experience.

Given that community colleges have been serving the needs of international students for over two decades, the continuous influx of international students into these institutions justifies a deeper understanding of the characteristics of this unique subpopulation to enable community college leaders and educators to ensure that they are meeting the needs of all students (Garcia et al., 2018). In particular, this research study aims to gain a more thorough understanding of how international students interact and engage in educationally purposeful activities both inside and outside of the classroom and how such engagement impacts their academic outcomes and sense of belonging.

### *Student Engagement*

A large body of literature demonstrates the importance of student engagement in achieving successful learning and academic outcomes in college (Astin, 1993; Chickering & Gamson, 1987; Kuh, 2005; Tinto, 1994). Student engagement has been defined as the quality of interactions with faculty and peers (Pascarella & Terenzini, 2005), involvement in active and collaborative learning (Chickering & Gamson, 1987), and the time they spend studying and using college resources (Pascarella & Terenzini, 2005). Recently, the topic of increasing student engagement in educationally purposeful activities has garnered increased attention by public legislators and accreditors, prompting higher

education institutions to engage in more intentional efforts among faculty in investing and encouraging these activities to help students attain more successful academic outcomes (Kuh, 2009; McClenney, Marti, & Adkins, 2006). The increased demand on institutions to demonstrate effective engagement practices has led to the use of assessment instruments, namely the National Survey of Student Engagement (NSSE) and the Community College Survey of Student Engagement (CCSSE), to measure the frequency of educational practices that positively predict academic outcomes (CCSSE, 2005).

Designed specifically for community colleges, the CCSSE collects data from students regarding the degree to which they are engaged in five key benchmarks of effective educational practices: 1) active and collaborative learning 2) student effort 3) academic challenge 4) student-faculty interaction 5) support for learners. Despite the vast extent to which the CCSSE has been used for higher education development and assessment, some scholars have questioned the construct validity of the CCSSE benchmarks and their predictive ability on different student outcomes such as academic achievement and persistence (Angell, 2009; Mandarino & Mattern, 2010; Nora, Crisp, & Matthews, 2011). Particularly in the case of students from different cultural backgrounds, Nora et al. (2011) note that the CCSSE model may be mis specified due to the inclusion of items that do not portray the underlying basis of a construct. Given that international students at community colleges come from a variety of cultural backgrounds and experiences, their engagement constructs and underlying items may differ from those of domestic students. These differences could uncover meaningful information about the support services and engagement components most significant to international student

success.

Though limited in scope, research surrounding international student experiences in community colleges highlights the importance of student engagement, particularly in the areas of academic advising and faculty and peer support, in promoting a sense of belonging, increasing positive interactions, and increasing the academic success of international students (Behroozi-Bagherpour, 2010; Lau, Garza & Garcia, 2019). Furthermore, studies have highlighted the importance of supportive institutional agents in community colleges, including faculty, advisors, and program directors, in providing students from diverse cultural and socio-economic backgrounds with a secure psychological base that will encourage their success and transfer to a four-year institution (Dowd, Pak, & Bensimon, 2013). This support is especially significant for international students who may feel maladjusted and need to achieve the sense of belonging that is necessary to succeed through college (Museus & Quaye, 2009). As recommended by Zhang (2017) and Hagedorn & Lee (2005), more research is needed to understand how international students view their participation in college as a central aspect to the engagement in the different learning paths that exist within an institution.

### **Purpose of the Study**

Given the unique characteristics of international students enrolled in community colleges and the gap in the literature surrounding their experiences in this setting, this study examines whether the CCSSE benchmarks and the items measuring each construct are empirically valid indicators of international student engagement. Subsequently, the study examines the relationship between these benchmarks and international student achievement. The study will also examine the extent to which ‘student-faculty

interactions' and 'support for learners' variables can predict sense of belonging among international students. The over-arching goal of this study is to develop a reconceptualized model of student engagement that is specific to international students in community colleges. In particular, the study addresses the following research questions:

- 1) What are the socio-demographic, pre-college, and academic characteristics of international students studying at U.S. community colleges?
- 2) To what extent are the five CCSSE benchmarks of effective educational practices valid constructs of international student engagement in the community college context?
- 3) What is the relationship between the five CCSSE benchmarks of effective educational practices and the academic achievement of international students?
- 4) What is the relationship between the five CCSSE benchmarks of effective educational practice and the sense of belonging of international students among peers, faculty, and administrative personnel?

### **Contributions of the Study**

Findings from this study will add to the scant body of literature surrounding international student experiences in U.S. community colleges by re-evaluating items in engagement constructs that may apply differently to international students as compared to their domestic peers. Despite the numerous studies that have investigated the validity of CCSSE benchmarks, to date no other study has examined the validity of these constructs in relation to international student engagement. Results from this analysis can provide community colleges with a reconceptualized model that reveals items more reflective of underlying engagement constructs specific to international students and their

characteristics. In addition, findings of this study will provide information about the relationship between the various institutional support components that can influence the academic outcomes and sense of belonging of this unique subpopulation of community college students. Research has demonstrated the positive impact of a sense of belonging and engagement in educationally purposeful activities (Lau et al., 2019; Mamiseishvili, 2012; Zhao et al., 2005), and the importance of support services from faculty, peers and academic advisors for their academic success (Behroozi-Bagherpour, 2008).

Engaging international students at community colleges, therefore, entails different components than in the four-year university setting, given the distinct characteristics and needs of these students that attract them towards community college enrollment (Anayah, 2012). Community college leaders will be able to use the results of this study to re-assess their curricular and co-curricular components in ways that better support the academic success of international students. This study will also provide insight into which facets of student engagement inside and outside of the classroom have the most significant effect on international student outcomes. Consequently, community college leaders may address areas of weakness and provide valuable, evidence-based recommendations that will allow faculty and advisors to better handle the unique needs of international students. Furthermore, since this study encompasses a national sample of international students, it will be among the first to offer a broad view of engagement practices and their impact on international student academic success and sense of belonging.

Though community colleges have included international education as a core mission since the early 2000s (Raby & Valeau, 2007), research by Green and Siaya (2005) has demonstrated that international education is, in reality, considered more of a

peripheral activity than a major component. Community colleges, by nature, are flexible, agile and accessible institutions dedicated to the success of all students (Treat & Hagedorn, 2013). The adaptable quality of community colleges, therefore, puts them in a prime position to use results of such research studies to advance the understanding of their growing student population and improve institutional support structures in ways that could promote international students' sense of belonging and academic success. Such improvements can be integral for the economic and educational growth of community colleges and of the nation as a whole, for it is becoming more evident that institutions failing to engage with the world are ultimately at a loss (Treat & Hagedorn, 2013).

## **Chapter II**

### **Review of Literature**

To provide a thorough understanding of international student engagement and its connection to sense of belonging and academic achievement in the community college context, this review of the literature provides a holistic view of the concept of student engagement as well as the experiences of international students in U.S. post-secondary education. The review first summarizes the literature on the unique challenges of international students in the U.S. and examines their engagement in both four-year and community college settings. Then, an overview of research on the development and significance of sense of belonging and its consequences on international student success is provided. This information will emphasize the importance of examining the impact of engagement constructs on sense of belonging that will enable community college leaders to reassess their student support services in ways that improve the outcomes of international students.

The next section reviews the large body of empirical research linking student engagement to various student outcomes, including learning, persistence, satisfaction, and academic attainment. An overview of the current concerns in the higher education landscape that have propelled both colleges and universities to develop assessment tools that measure the academic and social engagement of students is then presented. The final section reviews criticisms of current student engagement assessment tools, specifically the NSSE and the CCSSE, and the effect of these criticisms on the reliability of these surveys as proxies for student success. This information establishes support for conducting a study that analyzes the applicability of the CCSSE on international students,

and introduces the data techniques described in the methodology section which follows.

### **International Students in U.S. Higher Education**

One of the most frequently mentioned challenges faced by international students in the U.S. are language barriers (Chen, 1999; Furnham & Alibhai, 1985; Gallagher, 2012; Smith & Khawaja, 2011). According to Chen (1999), second language anxiety can negatively impact international students both academically and socially, affecting their ability to write assignments, communicate with peers and faculty, and understand lectures. In social contexts, social language anxiety impedes international students' ability to interact and befriend domestic students (Montgomery & McDowell, 2009). The lack of confidence in communicating can hinder the ability of international students to effectively engage in activities that can be beneficial to their learning and development, impeding their academic achievement.

Also, international students often have difficulties adapting to a new learning environment, particularly students coming from collectivist cultures who are not accustomed to Western styles of teaching (Edgeworth & Eiseman, 2007; Misra, Crist, & Barrant, 2003). Collectivist cultures tend to stress more autocratic teaching styles focused on memorization, which differs from Western teaching that promotes critical thinking and individual analysis (Aubrey, 1991; Liberman 1994). Such differences present added stressors that hinder the acculturation process of international students to the U.S.

Aside from academic stressors, international students also suffer from sociocultural stressors due to being away from their home country (Furnham & Alibhai, 1985). Homesickness, culture shock, loneliness, and alienation are just a few of the challenges these students face upon arriving at their new educational destination (Smith



& Khawaja, 2011; Zhao et al., 2005). Due to cultural disparities, international students may feel overwhelmed by differences in cultural norms and religious values and beliefs as well as social activities conducted in the new environment (Banjong, 2015; Furnham & Alibhai, 1985). These disparities contribute to the feelings of isolation that international students may feel, affecting their ability to interact with domestic students (Yeh & Inose, 2003).

Collective findings from the literature demonstrate that international students experience higher levels of discrimination than domestic students, causing them to gravitate more towards forming friendships with other international students they can identify with (Pak, Dion & Dion, 1991; Poyrazli & Lopez, 2007; Schmitt, Spears, & Branscombe, 2003). Studies have also found that domestic students express disinterest in forming friendships with international students, which could further alienate international students from the mainstream campus culture (Zhang and Burton, 2007).

Moreover, environmental stressors including financial issues and visa restrictions can place a great deal of strain on international students throughout their academic journey (Bohman, 2014). The clear majority of international students studying at U.S. universities and community colleges hold F-1 visas, which are temporary student visas valid for the length of the educational period (Institute of International Education, 2018). Visa requirements include enrolling full-time, and work eligibility is restricted to on-campus employment for the first academic year, followed by off-campus employment that is related to their field of study which must be approved by United States Citizen and Immigration and Citizenship Services (Department of Homeland Security, 2018). As a result of these restrictions, international students feel enhanced pressure to maintain their

full-time enrollment status while struggling to find suitable employment that could provide some financial support, particularly because as international students are ineligible for any kind of federal financial aid (Hagedorn & Lee, 2005), and approximately 82% of undergraduate international students rely on personal or family income to support them through college (Institute of International Education, 2018). Collectively, the above research findings concerning the challenges faced by international students in the US in addition to the recent influx attraction of international students to US community colleges further justifies the need to gain a better grasp of their experiences in community colleges

**International Student Engagement.** Most of the research surrounding international student engagement focuses on their experiences in four-year institutions and compares these experiences to those of domestic students (e.g. Banjong, 2015; Korobova & Starobin, 2015; Zhao et al, 2005). The results of these studies emphasize the importance of campus support services and social support on the academic success and educational satisfaction of international students. Findings from these studies also highlight the many challenges that deter international students from receiving the maximum benefits from their educational experience, particularly without the necessary programs and policies put in place for their support.

Zhao, Kuh, and Carini (2005) examined the extent to which international undergraduate students engage in effective educational activities in comparison to domestic students. Specifically, their study compared student activities in the areas of student learning, college satisfaction and personal development. Their analysis used results from the NSSE administered to 317 universities gathered in Spring 2001. The

study found that first-year international students demonstrated higher degrees of academic challenge and active and collaborative learning and used technology more frequently than their domestic counterparts. However, results also showed that these students spent significantly less time on leisure and social activities and felt less satisfied compared to domestic students (Zhao et al., 2005). Similarly, Korobova and Starobin (2015) conducted a similar study using the NSSE and found that international freshmen students dedicated more time and effort towards their academics to make up for the lack of social life during their first year. This result may be explained by the pressure to succeed academically so as to not disappoint their families in their home country who are supporting them financially (Dozier, 2001).

Studies have also examined the extent to which international student engagement in the four-year context predicted academic performance (Banjong, 2015; Parikh 2008). Banjong (2015) studied the effect of campus resources on the academic performance of 344 international students enrolled in a large U.S. Midwestern University. Using a questionnaire designed to specifically address international students' challenges, including English proficiency, financial status, and homesickness, the questions investigated the degree of interaction and support they received from different campus facilities. Using multiple linear regression analysis to first examine the impact of student challenges on academic performance, the study found that English language difficulties had the strongest negative relationship to academic success ( $r=-0.46$ ,  $p<0.001$ ), followed by homesickness and financial difficulties, respectively (Banjong, 2015). The study subsequently examined how campus resources could affect the academic outcomes of international students. The results demonstrated that if international students were

encouraged to seek assistance by visiting different campus resources their academic performance could improve by at least 27%.

Despite the growing number of international students at community colleges and the vast benefits that engagement can have on various student outcomes, only a handful of research studies examine their engagement within the community college context. Dodge (2015) conducted a comparative analysis examining several aspects of the academic engagement of domestic and international students. The study used the STEM Student Success Literacy Survey (SSSL) as the data instrument that focused on concepts of self-efficacy, social capital and transfer knowledge of community college students following STEM pathways but applied it to all international students enrolled in academic programs regardless of their majors. Using results from a sample of 488 students enrolled at a large community college in the southeast, the study revealed several significant findings concerning the characteristics of international students in community colleges and their academic engagement activities. Descriptive findings demonstrated that international students were significantly younger than domestic students and 63% of them attended college full-time while only 47.7% of domestic students did. Also, Dodge (2015) found that international students were significantly more academically prepared in the areas of math and science while much less prepared in developmental English. A significantly higher number of international students completed developmental English courses in both reading and writing, supporting other research studies that highlight the lack of English proficiency among international students and its influence on social interactions with peers and faculty as well as on their academic success (Pederson, 1991; Smith & Khawaja, 2011). Lack of English proficiency can cause international students to

develop second language anxiety, impeding their ability to effectively communicate with peers and instructors and understand lecture material (Campbell, 2007; Glass & Westmont, 2014). As a result, international students often withdraw from engaging actively in class discussions due to fear of losing face among peers who are native speakers of English (Campbell, 2007).

In analyzing the differences in academic engagement between international and domestic community college students, several studies found that international students channel more energy towards non-interactive academic engagement than they do towards interactive engagement activities (Dodge, 2015; García, Garza, & Yeaton, 2016; García, Li, McNaughtan, Leon, Eicke, & McClain, 2018). Collective findings from these studies found that international students spend more hours studying and preparing for classes on their own compared to their domestic parts and spend less time working with other students and contributing to class discussions. The non-interactive learning approaches of international students, particularly those from collectivist cultures, have been attributed to cultural differences in learning style preferences (Edgeworth & Eiseman, 2007; Misra, Crist, & Barrant, 2003; Yu & Shen, 2012). International students from collectivist cultures are often accustomed to a more stringent method of teaching focused on memorization, and thus may find it difficult to adapt to Western styles of teaching (Misra et al., 2003). Furthermore, language barriers also play a major role in deterring international students from participating in class discussions or from engaging with domestic peers (Pederson, 1991).

In another comparative analysis between international and domestic community college students, Garcia et al. (2018) examined the effect of engagement with

institutional support structures on enrollment satisfaction. Using data from the Survey of Entering Student Engagement (SENSE) drawn from 2014, respondents included a nationwide sample of 1,389 international and 24,111 domestic community college students. Though similar to the CCSSE in scope, the SENSE survey is administered to first-year students at the beginning of the semester and more narrowly focuses on their early experiences with academic and campus-support services (Talking SENSE, 2007). The study employed structural equation modeling (SEM) to compare relationships between latent constructs in order to identify which areas of institutional support were most significant to international student enrollment satisfaction. Specifically, the study focused on types of engagement (inside and outside of the classroom) as well as faculty and advising support and their influence on enrollment satisfaction. The most significant finding of the study was that academic advising was the strongest predictor of enrollment satisfaction among international students in community colleges (Garcia et al., 2018). Results also demonstrated that faculty support was a significant predictor of in-class engagement for international students and academic advising was a significant predictor of out of class engagement. In summary, findings from the study underscored the role of academic advising and faculty support in promoting international student engagement and satisfaction and also highlighted the importance of providing support services and programs designed to meet to the needs of international students (Garcia et al., 2018).

Very few studies investigate the role of international student engagement on their persistence in the community college setting. The dearth in literature on this topic is partly due to the fact that persistence rates of international students are not reported by the Institute of International Education or by government entities in the U.S. (Andrade &

Evans, 2009). Mamiseishvili's (2012) study is one of the few that examine the factors influencing their persistence in U.S. postsecondary institutions. The analysis used data from the Beginning Postsecondary Students Longitudinal Study, which studied international students from both 2- and 4-year institutions. Using logistic regression techniques, the study explored whether demographic characteristics, in-college characteristics, academic integration and social integration were predictive factors of international student persistence (Mamiseishvili, 2012). Findings demonstrated that the academic integration variables of meeting with academic advisors and participating in study groups were significant predictors of persistence. Overall, the study found that academic integration, GPA and degree plans were significant predictors of international student persistence. These findings support prior studies that emphasize the importance of academic integration, particularly in the areas of advising and peer support, on international student persistence (Andrade, 2008; Quintrell & Westwood, 1994).

Research studies have also found that international students make considerably stronger efforts than domestic students in interacting with faculty and academic advisors to get feedback about their work, discuss course requirements, and consider transfer plans (Dodge, 2015; Garcia et al., 2018). Despite these findings, Sallie (2008) found that many community colleges across the nation are considerably lacking in areas of institutional support vital for international student persistence and success and argues for the creation of strong academic and non-academic support services tailored to the unique needs of international students (Sallie, 2008).

**Sense of Belonging and International Students.** Much of the research surrounding international student experiences focuses on the challenges they face while attending U.S.

postsecondary institutions, namely the lack of social support, language barriers, culture shock, loneliness and alienation from the mainstream campus culture (Smith & Khawaja, 2011; Zhang, 2017). Several studies have noted the negative impact these challenges can have on the mental health, academic success, and general quality of international students' educational experience (Ng, 2006; Moores & Popadiuk, 2011). During the process of acculturation, international students undergo a variety of new encounters and difficulties in the new environment that lead to acculturative stress (Reid & Dixon, 2012), which can have a negative impact on the ability of international students to interact with domestic peers and faculty (Townsend & Poh, 2008). The lack of meaningful cross-cultural interactions between international students and members of their campus community causes these students not to develop a sense of belonging to their campus community (Brandenburg & de Wit, 2011; Gareis, 2012).

A sense of belonging has been described as a fundamental human need by behavioral researchers (Baumeister & Leary, 1995), encompassing stable and lasting social interactions that demonstrate concern for a person's wellbeing (Baumeister & Leary, 1995). Glass et al. (2015) describe the significance of sense of belonging to student success, explaining that "due to the evolutionary roots of humans' need to belong, studies across cultures indicate how social exclusion thwarts the need to belong, decreasing emotional well-being and academic performance, and increasing susceptibility to self-defeating behavioral patterns and social avoidance" (Glass et al., 2015, p.2). Research examining factors contributing to students' sense of belonging emphasizes the importance of social and ecological contexts, such as classroom interactions with peers and faculty, in creating opportunities that promote positive cross-cultural interaction



(Osterman, 2000; Pan, 2011).

A growing body of research has investigated the role of sense of belonging as a significant factor supporting international students' resilience through college (Pan, 2011; Glass, Kociolek, Wongtirat, Lynch, & Cong; 2015; Glass & Westmont, 2014). One of the most cited factors in the literature on college student academic success, sense of belonging has been associated with several positive outcomes for international students, specifically positive cross-cultural interaction and higher academic performance (Glass & Westmont, 2014; Hendrickson, Rosen, & Aune, 2011; Kashima & Loh, 2006).

Glass and Westmont (2014) examined the buffering effects of sense of belonging on the cross-cultural interactions and academic success of 415 undergraduate international and 816 domestic students across eight research universities in the U.S. Their study employed the Global Perspective Inventory (GPI), a survey containing sections that capture demographic information, curricular and co-curricular involvement, and developmental experience. The study measured sense of belonging through the use of sub-scale of the GPI survey, which asked students to rate on a 1-5 scale the extent to which they felt they were a) members of the campus community, b) part of the campus community, and c) had a sense of belonging to a campus community (Glass & Westmont, 2014). Using structural equation modeling (SEM) to assess the mediating effects of sense of belonging on academic success and cross-cultural interaction, results demonstrated significant differences in how sense of belonging impacts outcomes of international and domestic students. The study found that a sense of belonging had a significant, direct positive effect on both the academic success and cross-cultural interaction for international and domestic students and that larger effect sizes demonstrated a larger

impact of a sense of belonging to international students' academic success as compared to domestic students (Glass & Westmont, 2014).

Also, Glass et al. (2015) used sense of belonging as a framework to analyze the extent to which international student interactions with faculty signal social inclusion and exclusion, subsequently examining how these interactions facilitate or impede the academic pursuits of these students. Their study employed narratives from 40 international students from two major research universities in the U.S., and subjects were selected from varying degrees of academic preparedness and financial resources. Narratives of those students emphasized the essential need for a sense of belonging to their institution prior to being able to effectively engage in the arduous academic requirements of their degree. Results also demonstrated the importance of positive interactions with professors in building an inclusive campus environment for international students. Throughout their narratives, international students viewed their professors as their primary source for academic and social support and interpreted simple acts and cues as strong signs of social inclusion or exclusion. Professors who demonstrated inclusive classroom practices and coordinated equitable classroom discussions promoted a sense of belonging among students from various backgrounds (Glass et al. 2015).

Though there has been an increasing emphasis on international students' sense of belonging in higher education research, the overwhelming majority of research focuses on students in the four-year university setting. To date, few studies have investigated sense of belonging of international students in the community college setting. Lau, Garza, and Garcia (2019) used data from the Community College Survey of Student

Engagement (CCSSE) to develop a better understanding of the on-campus services that contributed most to international students' sense of belonging. The study examined a nation-wide sample of 6,043 international students and used three separate multiple regression analyses to assess the factors contributing to international students' sense of belonging with peers, instructors, and administrative personnel. Results demonstrated that academic advising was the strongest predictor of sense of belonging across all three models (Lau et al., 2019).

García et al (2019) used the CCSSE dataset to examine the predictors of international students' sense of belonging and persistence in community colleges. The analysis differed from the present study as it refrained from using the five CCSSE benchmark structure to assess the impact of existing latent variables on international student outcomes. Rather, the study employed Deil-Amen's (2011) construct of socio-academic integration moments as well as Tinto's (1993) constructs of academic and social integration to select questions from the survey that more closely correspond with the hypothesized latent variables. Confirmatory factor analysis was used to estimate the model fit of the proposed model structure. Using a sample of 6,043 international students, the study employed SEM to estimate the direct effects of academic, socio-academic, and social integration on the two outcome variables of sense of belonging and persistence. Findings from the study demonstrated that the latent construct of socio-academic integration, which contained items related to college emphasis on student support, was the strongest predictor of sense of belonging. Furthermore, socio-academic integration was found to be the only statistically significant predictor of persistence (Garcia et al., 2019).

Behroozi-Bagherpour's (2010) study of 10 international students in a large, urban community college district in Texas demonstrated the significance of academic advising as a major source of support for international student success. Respondents from this study claimed that one of the key reasons that they could not yet graduate from their college was the lack of guidance and support from their academic advisors. Specifically, many of the students interviewed felt that they were not given adequate information regarding transfer requirements and, therefore, were not able to do so. It is apparent from the scant literature available on international students in the community college setting that academic advising plays an important role in promoting a sense of belonging among international students. Overall, findings from the literature on international student engagement in community college highlight the importance of academic advising and faculty support as significant predictors of international student satisfaction and educational attainment (Behroozi-Bagherpour, 2010; Garcia, Li, McNaughtan, Leon, & Eicke, 2018; Mamiseishvili, 2012), and other studies have demonstrated the importance of the sense of belonging among international students as a significant predictor of positive interactions and academic outcomes (Brandenburg & de Wit, 2011; Gareis, 2012; Glass & Westmont, 2013; Glass et al., 2018).

### **Student Engagement in U.S. Higher Education**

Kuh (2009) defines student engagement as “the time and effort that students devote to activities that are empirically linked to the desired outcomes of college and what institutions do to induce students to participate in these activities” (p. 2) This definition is grounded by several decades of research studies that demonstrate the benefits and outcomes associated with engagement in educationally purposeful activities.

(Astin, 1993; Chickering & Gamson, 1987; Hu & Ku, 2003b; Pace, 1980, 1984; Pascarella & Terenzini, 1991, 2005). Production of these benefits are in the domains of academic performance (Tross, Harper, Osher & Kneidinger, 2000) student persistence (Astin, 1993, 1999; Milem & Berger, 1997, Tinto, 1993, 2000), the development of cognitive and intellectual skills (Anaya, 1996), and adjustment in college (Zhao, Kuh, & Carini, 2005) as well as psychosocial development (Astin, 1993, 1999; Berger & Milem, 1999; Kuh, 1995; Pascarella & Terenzini, 1991, 2005; Tinto, 1993).

Over the years, scholars have defined different aspects of student engagement and empirically showed their significant relationship to positive student outcomes. Pace (1980, 1984) created the College Student Experiences Questionnaire (CSEQ) with the goal of measuring the quality of effort that students invested in their educational activities in order to define which activities affected the various components of student learning and personal development. Results from his research spanning over the course of three decades demonstrated that students gained more from their educational experience when they invested more time and effort to certain activities that were central to their academic and personal development. These activities included studying, collaborating and interacting with peers and faculty, as well as applying learned concepts to different situations (Pace, 1984, 1990).

Astin's (1984) theory of involvement also underscored the behavioral aspect of the quality of effort that students invest in educational activities. Astin defined involvement as the amount of both psychological and physical energy that students devote to their educational experiences, which could be both academic and social. Much of the research based on involvement theory, however, concentrates on social or

extracurricular activities and their positive influence on student outcomes (Pascarella & Terenzini, 1991, 2005). The involvement theory encompasses a wider range of factors than time on task and quality of effort, finding much more explanatory power in the combination of student behaviors, energy, and environment as significant factors on student retention, development and persistence (Astin, 1984). This combination is outlined in Astin's (1993) Input-Environment-Output (I-E-O) model, which highlights the effect of participating in a variety of academic and social activities on several student outcomes.

Involvement theory and the I-E-O model have been used by research institutes such as the Cooperative Institutional Research Program (CIRP) to develop surveys for students that measure the frequency of their participation in different academic and extracurricular activities (Kuh, 2009). The goal of the CIRP surveys is to identify activities and educational practices that lead to positive student outcomes (Wolf-Wendel, Ward, & Kinzie, 2009). Results of these surveys empirically demonstrate the significance of active student engagement on student persistence in educationally purposeful activities inside and outside of the classroom. These results have been supported by numerous studies (e.g. Bean, 1990, 2005; Pascarella & Terenzini, 2005; Tinto, 2000).

One of the most regularly cited researchers on student persistence, Vincent Tinto, posits that student engagement, or academic and social integration, is the strongest predictor of student persistence through college (Tinto, 2000). In his studies, he explains that students decide to leave their institution because of feeling disconnected from members of their institution, including peers, instructors, and administrators. On the other hand, Tinto argues, those students that are more integrated with their academic and social

communities are more likely to feel committed to their institution, which encourages a student to persist (Tinto, 2000). Relatedly, Bean (1990) discusses the notion of institutional commitment as a product of the active engagement of students in activities that have educational value and instill a sense of connection and enduring responsibility to the institution

Among the most notable research on student engagement, Pascarella and Terenzini's (2005) study describes the impact of college on students in a variety of domains and notes that this impact is "largely determined by individual effort and involvement in the academic, interpersonal, and extracurricular offerings on a campus" (p. 602). The authors describe the environmental factors that positively influence student persistence and educational attainment (Pascarella & Terenzini, 1991). These factors include active participation and use of campus support services, including advising, orientation, and general education courses, all of which have been shown to promote academic survival skills. Furthermore, the study underscores the importance of student involvement in classroom activities, including classroom discussions and engagement with faculty. In-class involvement, in its different facets, maximizes psychosocial adjustment and development of students (Berger & Milem, 1999; Pascarella & Terenzini, 1991).

The behaviors of students that promote the active engagement in educationally purposeful activities both inside and outside of the classroom are important. However, another integral part of student engagement is the way institutions use their resources, support services, and learning opportunities to encourage students to partake in the activities that lead to successful outcomes such as academic attainment, adjustment,

satisfaction and persistence (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007). Numerous studies have found student engagement to be a measure of institutional quality (Astin, 1993; Kuh, 2001; Pascarella, 2001). Astin (1993) describes that the effectiveness of any educational program is directly linked to its ability to promote student involvement. Additionally, Pascarella (2001) emphasizes the role of colleges and universities in creating and maintaining practices that enhance students' academic and social integration for these institutions to achieve educational excellence.

Despite the importance of classic engagement theories that demonstrate its impact on successful student outcomes (e.g. Astin, 1991; Pace, 1984; Tinto, 1993), there have been several criticisms over their inapplicability to students from diverse cultural backgrounds. Demographic shifts, globalization, and the change from an elite form of higher education to a more open, universally accessible one have all collectively changed the nature of today's undergraduate student population in the U.S. (Hu & Ku, 2003a). These changes have created a sense of general skepticism over the benefits of the current higher education system and the ability of colleges and universities to equip students with the necessary tools to function in an increasingly multicultural society (Gurin, Dey, Hurtado, & Gurin, 2002). Shortages in these necessary tools not only negatively impact students on an individual level, but also undermine the global competitiveness of the nation (Association of American Colleges & Universities (AAC&U), 2007).

One of the ways in which institutions are not effectively engaging with today's undergraduate students is not incorporating multicultural perspectives in classrooms (Quaye & Harper, 2014). Professors have been found to lack thoughtfulness and strategy in building classroom experiences conducive to cross-cultural learning, despite the robust



body of literature that proves the benefits and positive outcomes of this type of learning and of diversity interactions (Hu & Ku, 2003a; Villalpando, 2002). Diverse interactions and cross-cultural learning produce gains in student cognitive development, degree aspirations, satisfaction with college, and cultural awareness and understanding (Astin, 1993; Gurin et al, 2002; Villalpando, 2002).

One of the main problems contributing to the deficiency in diverse interactions and multi-cultural learning lies in a lack of guidance from colleges and universities to build environments that allow students to realize the gains from diverse experiences (Chang, Chang, & Ledesma, 2005). A challenge faced by many colleges and universities today is how to allocate their resources in a manner that will enable today's students to invest more time and energy on those experiences that produce the most beneficial outcomes for them (Hu & Kuh, 2003b). Creating learning environments that promote student engagement is becoming increasingly important as higher education institutions face demands from governing boards, state and federal governments, and the public for better quality education and increased accountability (McClenney, Marti & Adkins, 2012). Consequently, colleges and universities are conducting assessment activities that revolve around the orderly collection, review and analysis of information about education programs and policies to advance teaching and learning, and improve student outcomes (Banta & Palomba, 2015).

### **Criticisms of Student Engagement Assessment Tools**

Two of the most renowned assessment tools for student engagement as a measure of collegiate quality across the four- year and community college contexts are the National Survey of Student Engagement (NSSE) and the Community College Survey of

Student Engagement (CCSSE). Both instruments measure the extent to which institutions are promoting student engagement across five key areas of effective educational practices, and these practices are hypothesized to measure institutional effectiveness (McClenney & Marti, 2012). NSSE's student survey, named the College Student Report, is used annually to collect information from four-year institutions around the two critical features of student engagement (Kuh, 2003, 2009). The first includes the time and effort that students dedicate to educationally purposeful activities both inside and outside the classroom, and the second includes the policies and practices employed by institutions that encourage students to participate in these activities (Kuh, 2003). Grounded by decades of research on the relationship of student engagement to successful student outcomes, the survey results allow institutions to identify practices that are most influential to student engagement (Chickering & Gamson, 1987). The NSSE groups key items into five benchmarks of effective educational practices which are 1) level of academic challenge 2) enriching educational experiences 3) student-faculty interaction 4) active and collaborative learning 5) supportive campus environment (Kuh, 2003; Pascarella, Seifert, & Blaich, 2010).

Based on the concept of the NSSE, the Community College Survey of Student Engagement (CCSSE) has been providing community colleges with assessment tools tailored to their unique characteristics since 2001 (McClenney, Marti, & Adkins, 2012). Like NSSE, CCSSE is built on the concept that student engagement, including the quality of effort involved in students' social and academic college experiences, is significantly associated with student learning, persistence, and academic achievement (McClenney et al., 2012). Like NSSE, the CCSSE theorizes five key benchmarks of student engagement

that are positively related to student outcomes, which include 1) active and collaborative learning 2) student effort 3) academic challenge 4) student-faculty interaction 5) support for learners (McClenney, 2006).

Several studies have demonstrated the validity of both NSSE and CCSSE benchmarks as a proxy for positive student outcomes in the four year and community college setting (e.g. Carini, Kuh, & Klein, 2006; Kuh, 2004; McClenney, 2007; McClenney et al., 2012; Price & Tovar, 2014). While findings of these studies broadly confirmed the reliability of engagement benchmarks and evidence of their significant relationships with student outcomes such as GPA and degree completion, numerous scholars have questioned these results (e.g Angell, 2009; Campbell & Cabrera, 2011; Mandarino & Mattern, 2010; Nora et al.; 2011, Porter, 2011). For example, Campbell and Cabrera's (2011) study investigated the reliability of NSSE constructs and their ability to predict cumulative GPA using NSSE data from a large public research university. The study found that the NSSE benchmarks were not well-represented by the individual items under each construct, evident through poor Cronbach alpha scores and low factor loadings (Campbell & Cabrera, 2011). Findings also demonstrated that the model obtained through structural equation modelling linking benchmarks to cumulative GPA indicated a poor fit of the data, with only one benchmark found to be a statistically significant predictor of GPA (Campbell & Cabrera, 2011). Porter (2011) also called into question the validity of college student surveys by critically examining the NSSE model and its empirical foundations. Porter argued that the NSSE survey fails to establish validity due to the inaccuracy of student responses and unclearly worded questions. Porter also highlighted the poor reliability scores of some NSSE benchmarks, and the

inability of other researchers to replicate their five-benchmark structure. In addition, Porter's study also emphasized the limited significant associations between NSSE benchmarks and objective measures of student outcomes, such as academic achievement and persistence (Porter, 2011).

Angell (2009) examined the construct validity of the CCSSE benchmarks using survey responses from a sample of 450 students. Results of the confirmatory factor analysis showed considerable differences in the items that were loaded onto each benchmark. For example, five items originally included in the academic challenge benchmark were found to have insufficient factor loadings and thus could not be included in that benchmark. Also, the study found that both the active and collaborative benchmarks and student-effort benchmarks demonstrated low reliability, with Cronbach's alpha values of 0.59 and 0.53, respectively.

Mandarino and Mattern investigated the validity of CCSSE benchmarks and their ability to predict five academic outcomes consisting of self-reported GPA, cumulative GPA, semester GPA, cumulative credit completion ratio, and the percentage of courses completed with a minimum grade of 70 percent or higher. The study used confirmatory factor analysis to assess the construct reliability of CCSSE benchmarks using responses to the survey administered to 1,030 students in Ontario College. Results demonstrated that the student effort benchmark had lower reliability compared to data reported by CCSSE ( $\alpha=0.38$ ), even though the original reliability value reported by CCSSE was low ( $\alpha=0.56$ ). Additionally, findings confirmed a statistically significant relationship between only two benchmarks (active and collaborative learning and academic challenge) and academic achievement outcomes.

Lastly, Nora, Crisp and Matthews (2011) conducted a similar study using CCSSE data from a sample of 393 students collected in the Spring semester of 2006. The purpose of their analysis was to quantitatively examine the five benchmarks identified by CCSSE through data reduction techniques and compare their results to the original CCSSE benchmarks. The study tested the relationship between original CCSSE benchmarks and student's academic performance, after controlling for gender and ethnicity. Results of the data reduction analysis produced latent constructs that were significantly different from CCSSE benchmarks. To begin with, the factor analysis produced two separate constructs for active and collaborative learning, conflicting with CCSSE's findings that they present one benchmark. Second, items originally under the CCSSE benchmark of student-faculty interaction did not group into a single construct but rather loaded onto other constructs including collaborative learning and faculty interactions. The study's resulting factors consisted of active learning, collaborative learning, academic challenge, support for learners, and student effort. Items included under the academic challenge and support for learners benchmarks also contained significant differences compared to the CCSSE benchmarks. In addition, like findings by Angell (2009), the student effort benchmark demonstrated a lack of reliability evident through a Cronbach's alpha coefficient of 0.69 (Nora et al., 2011).

In the second phases of the analysis, a regression analysis was conducted to test the effect of the original CCSSE benchmark scores on student performance. Results of this analysis demonstrated that the academic challenge and active learning benchmarks were significant positive predictors of GPA, whereas the student effort benchmark was a significant negative predictor, indicating that the more effort a student put into their

studies, the lower their GPA. Overall, the three engagement benchmarks only accounted for 10.3% of the variance in GPA.

Collective findings from the studies investigating the validity of CCSSE constructs found significant differences in both the latent-constructs derived through data reduction techniques, and the items included in each construct. These differences, along with the low reliability values of the benchmarks, has raised skepticism about the validity of these benchmarks as viable measures of student engagement. Therefore, further empirical research is needed to regarding the reliability of CCSSE benchmarks as indicators of international student engagement and the effect of these benchmarks on the academic achievement of international student populations. Also, advancing research in this area, especially through the purposes of this study, is important for students who come from diverse cultural backgrounds and face unique challenges that may cause their engagement constructs, and the items underlying them, to be significantly different.

### **Conceptual Framework**

Several research studies analyzing the relationship between the student engagement activities and academic achievement have used Astin's (1993) Input-Environment-Output (I-E-O) model as a guiding conceptual framework (e.g. Ahmad, Anantharaman, & Ismail, 2011; Villalpando, 2002; Zhao, 1999). Based on Astin's extensive and widely cited work on student involvement, the I-E-O model stipulates that student outcomes are the product of the interactions of student inputs and environmental characteristics of the educational environment that together influence the way in which students engage in educationally purposeful activities (Astin, 1993). According to the I-E-O model, inputs are the distinct characteristics and attributes that students bring to an

institution, the environment includes what students experience throughout their program, and outputs include the outcomes students achieve because of their involvement in the program, such as persistence, academic achievement, and satisfaction.

As colleges and universities across the U.S. are becoming more diverse, much scholarly work has focused on the need to incorporate diverse perspectives into our curriculum and pedagogy to account for this change (Milem, 2003; Villalpando, 2002). For this reason, some studies have adapted the I-E-O model to fit the unique characteristics of diverse sub-populations (Harris & Wood, 2016; Terenzini, 2005). Harris and Wood's (2016) Socio-Ecological Outcomes (SEO) Model was informed by Astin's (1993) model to describe the engagement experiences and outcomes of men of color attending community colleges. Grounded by theory and literature on men of color, as well as by the empirical findings of the Community College Survey of Men (CCSM), the SEO model is comprised of background factors, societal factors, and socio-ecological domains that are significantly associated with the academic achievement of men of color (Harris & Wood, 2016).

Due to the lack of theoretical frameworks that specifically focus on international student populations, the conceptual framework chosen for this study was drawn from multiple perspectives and studies on international student experiences as well as theories, including Astin's (1993) model and Harris and Wood's (2016) Socio-Ecological model. Several features of the SEO model apply to international students and their experiences in U.S. higher education. In particular, the model focuses on the various barriers and negative stereotypes regarding race and academic level faced by men of color that may lead them to lack both a sense of belonging to an institution and a lack of confidence to

succeed in community colleges (Harris & Wood, 2016). Literature on the challenges of international students in the U.S. highlights the effect of cultural barriers, stereotypes and language difficulties on the academic success and social integration of students (Banjong, 2015; Furnham & Alibhai, 1985; Smith & Khawaja, 2011; Zhang, 2017). Such challenges contribute to international students' sense of isolation from the mainstream campus culture, leading to a lack of sense of belonging among domestic peers, faculty and staff (Behroozi-Bagherpour, 2008; Glass et al, 2015; Lau et al., 2018).

The similarities between the tenants of the SEO model and the experiences of international student populations enable the model to be adapted to the unique characteristics of international students. Studies have applied the SEO model to study diverse student populations in higher education (e.g. Blevins, 2018; Brookins, Banks, & Clay, 2018). For example, Blevins (2018) applied the SEO model to examine factors predicting housing insecurities for under-represented women in community colleges. Also, Brookins et al.'s (2018) study relied on the SEO model to analyze factors that improve the institutional climate for undergraduate and graduate students of color in biomedical and behavioral sciences. Similar in scope to the tenants of the SEO model, Astin's (1993) Input-Environment-Output model stipulates that student outcomes are the product of the interactions of student inputs and environmental characteristics of the educational environment that together influence the way in which students engage in educationally purposeful activities. According to the I-E-O model, inputs are the distinct characteristics that students bring to an institution, the environment includes the experiences that students undergo throughout their program, and outputs include the outcomes that students achieve as a result of their involvement in the program, such as



academic achievement, and persistence (Astin, 1993).

The International Student Engagement (ISE) model is presented in Figure 1. This conceptual framework was guided by both Astin's (1993) and Harris and Wood's (2016) model, and also integrated key perspectives from the literature on international student experiences. The ISE model is divided into seven key constructs, categorized into input factors, socio-ecological domains, and outputs. Table 1 presents an overview of the variables included in each construct, as well as supporting literature linking these variables to the academic success and sense of belonging of international students. The first two constructs of the model include background and societal factors and describe the inputs and experiences that students bring with them prior to enrolling in community colleges. This construct included variables such as age, gender, marital status, presence of children, and enrollment status. Research on international student experiences demonstrates the influence of background factors on the academic success and cultural adjustment of students (Chen, 1999; Furnham & Al Sheikh, 1993; Gallagher, 2012; Pederson, 1991; Petrucci & Hu, 1995; Poyrazli & Kavanaugh, 2006; Smith & Khawaja, 2011). Guided by this research, the background factors of the SEO model were adapted to include variables informed by studies on international students.

The second construct of the model, societal factors, encompasses socio-cultural forces and that attract students to community colleges. In Harris and Wood's (2016) model, this variable described the negative societal dispositions that influence the degree to which men of color believe in themselves and the ability to succeed in community colleges. For example, some of these socio-cultural forces include economic conditions, stereotypes regarding the academic inferiority of men of color, both of which are

attributed to the proliferation of men of color in U.S. community colleges (Harris & Wood, 2016). In the case of international students, socio-cultural forces represent the pre-college factors, including English language proficiency and financial support, that attract them towards community colleges as a starting point to U.S. higher education. For example, several studies highlight the significance of increasing language proficiency as one of the main reasons for the proliferation of international students in community colleges (Bailey & Weininger, 2002; Blumenthal, 2002; Ellis, 1999; Kegel, 2009). Community colleges offer an increased focus on building English language skills through English as a second language (ESL) courses, helping international students overcome language barriers and second language anxiety, which can negatively impede their interactions with domestic peers and faculty (Chen, 1999; Zhang, 2017). Also, international students enrolled at community colleges come from a variety different backgrounds, degrees, and academic levels, all of which could have a significant effect on their academic achievement through college (Anayah & Kuk, 2015). For this reason, it was important to include their highest academic credential earned in this construct.

The four socio-ecological domains of the ISE model represent the interactions between sociological and environmental factors that influence the student success of international students. Drawn from the SEO model, these domains consist of the noncognitive domain, the academic domain, the environmental domain and the campus ethos domain (Harris & Wood, 2016). Using literature on international student engagement in community colleges, and empirical findings from the CCSSE data source employed by this study, the CCSSE benchmarks of effective educational practice for international students were used to represent the socio-ecological domains of the SEO

model. CCSSE benchmarks captured several aspects of the socio-ecological domains, as well as the interplay between these benchmarks and the success outcomes of international students.

The first domain, the noncognitive domain, consists of social variables that reflect students' emotional responses and interactions with the different contexts and people in a community college setting (Harris & Wood, 2016). This domain is represented by the active and collaborative learning benchmark for international students, which includes items measuring the frequency of student interactions with peers and faculty regarding course presentations, class discussions, and assignments. Studies on international student success highlight the positive effect of cross-cultural interactions with peers and faculty on the academic success and sense of belonging of international students (Behroozi-Bagherpour, 2010; Glass & Westmont, 2014; Glass et al; 2015). The effect of socialization and cultural values also impacts the interactions of international student populations, particularly those from collectivist cultures, who are accustomed to more stringent ways of teaching that are focused more on memorization and less on class discussions (Misra et al., 2003).

The academic domain is comprised of variables directly associated to students' academic experiences and is supported by studies that demonstrate the significance of key academic variables to student in community colleges (e.g. Hagedorn et al., 2001; Mason, 1998). These variables include the degree of commitment and effort to their course of study, the interactions of students with faculty, and the use of academic advising and tutoring services (Harris & Wood, 2016). Literature on student-faculty interactions of international students emphasizes the importance of faculty in creating

inclusive classroom environments for international students and exhibiting emotional cues that signal inclusion or exclusion among international students (Glass et al., 2015). Studies have also highlighted the significant role of student-faculty interactions in providing international students with additional academic and social support to succeed through college (Garcia et al., 2018; Glass & Westmont, 2014). Unlike men of color, international students make strong efforts to interact with faculty regarding coursework and transfer requirements (Dodge, 2015; Garcia et al., 2018). The academic domain is presented by academic challenge, student effort and student-faculty interaction benchmarks of the CCSSE model for international students.

The academic challenge benchmark characterizes the degree of mental challenge required by students, such as the extent to which coursework requires them to synthesize, analyze and apply relevant information (CCSSE, 2016). The student effort benchmark describes time on task variables that describe the amount of work students put into reading, writing and preparing for their class requirements (CCSSE, 2016). Collective findings from studies on international student engagement found that students dedicate more effort on non-interactive academic engagement, such as preparing for class, studying and working on class assignments, compared to domestic students (Dodge, 2015; García, Garza, & Yeaton, 2016; García, Li, McNaughtan, Leon, Eicke, & McClain, 2018). While these increased academic efforts may contribute to higher academic achievement among international students, their tendency to choose non-interactive learning methods could contribute to their sense of isolation and lack of sense of belonging to an institution (García, Garza, & Yeaton, 2016; García, Li, McNaughtan, Leon, Eicke, & McClain, 2018).

The third domain of the SEO model, the environmental domain, reflects external student commitments that may deter community college students from focusing their time and effort on their academic pursuits (Anderson, Alfonso, & Sun, 2006; Dougherty & Kienzl, 2006; Harris & Wood, 2016; Horn & Nevil, 2006). These commitments include family responsibilities, stressful life situations, and financial difficulties all of which have been referenced to have a negative influence on the academic success and persistence of community college students (Wood & Williams, 2013). This domain also captures the effect of different external supportive agents in providing support and encouragement to students, helping them succeed through college (Harris & Wood, 2016). The challenges faced by international students in the U.S. have been widely cited, and include homesickness, discrimination, language barriers, and culture shock, and financial issues (Banjong, 2015; Bohman, 2014; Montgomery & McDowell, 2009; Poyrazli & Lopez, 2007; Smith & Khawaja, 2011). These challenges can negatively impact the academic progress of international students and contribute to their feelings of isolation and lack of sense of belonging to their institution (Banjong, 2015; Parikh, 2008).

The final domain of the SEO model, the campus ethos domain, represents institutional programs and campus resources that influence the academic experience of students in the community college (Bensimon & Dowd, 2009; Gandara, 2002; Harris & Wood, 2016). This domain portrays the institution's responsibility in building a campus climate that is conducive to student learning and success and align the necessary campus resources to do so. While the environment domain entails external supportive agents, such as friends or family, the campus ethos domain consists of internal supportive agents, such as support staff, campus resources, peers and faculty (Harris & Wood, 2016). Both

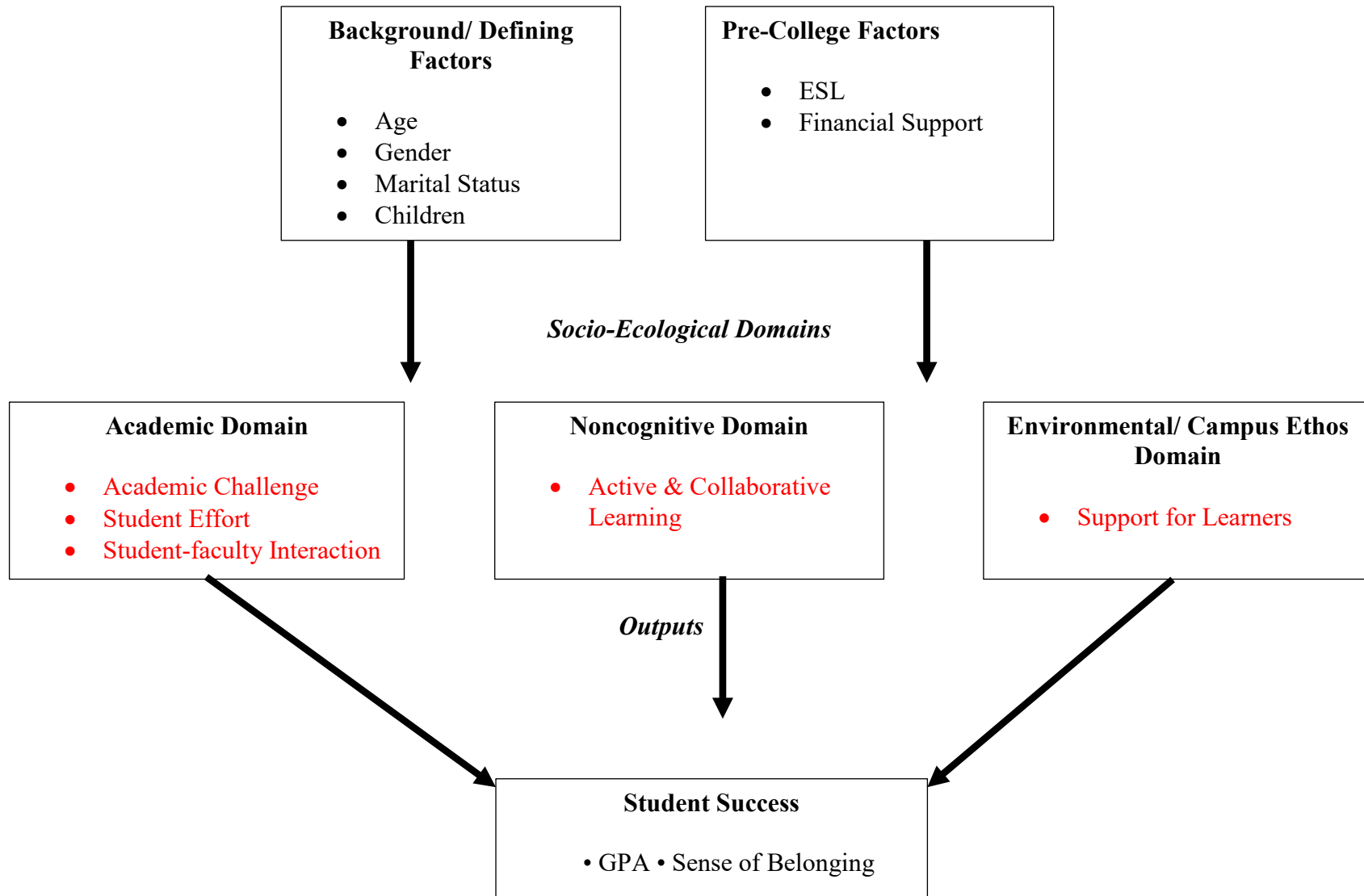
the environment and campus ethos domain were captured in the support for learners benchmark of the CCSSE, which characterizes actions taken by a college to support student success through cultivating a positive educational environment whereby students interact with different groups on campus (CCSSE, 2016). Items included in this benchmark include student perceptions on the extent to which their college emphasizes student support, cross-cultural interactions, financial support, and assisting students in coping with non-academic responsibilities. Supported by research studies that demonstrate a positive relationship between college support variables and the academic success and social integration of community college students, this benchmark also includes the frequency with which students use academic advising and career counseling services (CCSSE, 2016).

The ISE model postulates that the backgrounds, socio-cultural experiences, and key socio-ecological domains of the model can react to influence the student outcomes of international students, such as GPA, transfer, persistence, and degree attainment, in significant and meaningful ways (Astin, 1993; Harris & Wood, 2016). Using the ISE model as the conceptual lens of the study, it is hypothesized that the background, pre-college characteristics and five CCSSE benchmarks reflected in the socio-ecological domains will have observable effects on both the GPA and sense of belonging of international students. The combination of background factors and socio-ecological domains depicted in the ISE model adapted Astin's (1993) I-E-O and Harris and Wood's (2016) SEO model in ways that applied to students from diverse cultural backgrounds. Table 2 presents a description of each construct of the model and how it applied to international student populations. For example, incorporating societal barriers that affect

the access and success outcomes of men of color in community colleges added relevance to the model, and was reflected in the present study by language barriers of international students in community colleges. Given that both the SEO model and the I-E-O model have been used as a guiding conceptual framework in studies of the experiences and outcomes of other diverse student populations, drawing upon both frameworks to develop the ISE model strengthened both the relevance and applicability of this framework to the study of international student populations.

**Figure 1.** The International Student Engagement Model (ISE) depicting factors influencing the GPA and sense of belonging of international students in U.S. community colleges.

*Inputs*





### **Chapter III Methodology**

This chapter describes the methods used in conducting this study. First, an overview of the data source is given, along with an explanation of the sample population. The following section provides a description of the independent and dependent variables employed in the analysis. Next, the analytical methods used for each research question are specified. The final section provides potential limitations that may affect the results of the analysis.

#### **Data source and sample**

The data used for this study was obtained from the Community College Survey of Student Engagement (CCSSE), an assessment tool used by community colleges since 2001 to identify institutional practices and student activities that encourage student engagement (McClenney, Marti, & Adkins, 2006). Based on extensive research connecting student engagement with positive student outcomes, such as student learning and academic achievement, the CCSSE provides community colleges with a useful proxy for student success (Marti, 2009).

The CCSSE's survey instrument, the Community College Student Report (CCSR), is administered each spring to students in classrooms of participating community colleges (CCSSE, 2012). The CCSR contains 38 items asking students questions related to their engagement behaviors across five key benchmarks of effective educational practices, consisting of 1) active and collaborative learning, 2) student effort, 3) academic challenge, 4) student-faculty interaction, and 5) support for learners (McClenney, 2006).

Questions ask students to rate the satisfaction, importance and frequency of different engagement activities on a Likert scale. These items include the frequency in which students contribute to class discussions, interact with faculty members, use academic and student support services, and participate in extracurricular and learning activities (CCSSE, 2012). Items on the survey also reflect the level of academic challenge students experience through examinations, assignments, and mental activities, and ask students questions that rate the extent to which coursework allows them to synthesize, analyze and apply information to real life problems.

The dataset contains a 25% a random sample of a three-year cohort of students, beginning in Spring 2013 and ending in summer 2015. The full sample (n=107,429) includes data from 694 community colleges located in 47 states. Classes were selected using a stratified random cluster sampling method, whereby each class represented a cluster and eligible classes were selected from a list of all credit courses at the developmental, first year and second year at each participating institution (CCSSE, 2019). The stratification sampling method was conducted based on the start times of classes, using three main time periods of morning, afternoon and evening. This method ensured that the number of classes selected in each time period was proportional to the total number of classes taught during that period. Eligibility of courses was assessed on whether they were credit courses and had regularly scheduled meeting times where the survey could be administered (CCSSE, 2019). Courses that did not count for institutional credit, were administered to high school or incarcerated populations, as well as online courses were ineligible and were excluded from consideration in the sample. International students represent 6.1% of the sample (n=6,739). For the purposes of this analysis, only

international students enrolled in credit courses were included in the study. Students who were enrolled in pass or fail classes or who were listed as not having a GPA in item number 21 of the CCSSE were excluded from the analysis. This reduced the sample to n=6,015 students.

## **Variables**

Guided by the tenants of the ISE model, the independent variables included in this analysis were categorized into input characteristics (including socio-demographic and pre-college characteristics) and socio-ecological domains that collectively interact to influence the academic achievement and sense of belonging among international students. The SEO model included various background characteristics that can affect a student's outcomes and the way through which they interact with the educational environment. Accordingly, this study used defining background and pre-college characteristics that are significant to the academic success of international students. The socio-ecological domains of the ISE model were represented by the five CCSSE benchmarks described below. Description of the items included in each benchmark is included in Table 1.

**Socio-demographic characteristics.** Variables in this category include a student's age, gender (male, female), marital status (single, married), enrollment status (full-time, part-time), having children (yes, no). All socio-demographic variables were categorical with the reference groups for each variable chosen based on the literature on international student characteristics in community colleges (Hagedorn & Lee, 2005).

**Pre-college characteristics.** Three categorical variables are included in this category: highest academic credential earned, remediation in English (ESL) and financial

support (personal, parental, and grants or scholarships,). The highest academic credential earned item contained responses including no credential, high school diploma or GED, vocational certificate, bachelor's degree and master's degree or above. The remediation in English variable asked students whether they were required to take developmental English courses and is an important control variable as many international students require remediation in English courses due to lack of English proficiency, which could negatively impact their academic achievement (Bailey & Weinigner, 2002; Blumenthal, 2002).

**Active and Collaborative Learning.** Items in this benchmark represent the opportunities through which students can collaborate with students and instructors to solve problems and discuss class content (CCSSE, 2016). This benchmark is grounded by a number of studies that empirically demonstrate the link between student interactions with faculty and peers to a number of student outcomes, including student learning, personal development, social integration, and persistence (Lundberg, 2014; Maxwell, 2000; Settle, 2011; Swigart & Murrell, 2001). The seven independent variables included in this category indicate how often students 1) asked questions during class, 2) made a class presentation, 3) worked with other students on a project, 4) worked on class assignments with peers outside of class, 5) tutored other students, 6) participated in a community based project as part of a course, and 7) discussed ideas from class material with people outside of class (CCSSE, 2014).

**Academic Challenge.** This benchmark is related to the degree of subject mastery required from students in addition to the amount of work and preparation anticipated (Payne, Kleine, Purcell, & Carter, 2005). For example, the academic challenge

benchmark assesses whether students were required to memorize basic facts in a course or synthesize ideas from various sources and apply them to real life problems. This benchmark is supported by Chickering and Gamson's (1987) principles that emphasize the importance of active learning techniques and time-on task requirements. The 10 items included in this benchmark include the extent to which students 1) analyzed basic facts, 2) synthesized and applied ideas from various sources, 3) evaluated soundness of information, 4) applied theories in practical situations, 5) used information to perform a new skill, 6) found exams difficult or challenging, 7) worked hard to meet teacher's expectations and, 8) felt that the college encouraged more study time. The last two items were measured by the number of written assignments students produced and the number of assigned readings in classes (CCSSE, 2016).

**Student effort.** Items under this benchmark describe the different ways in which students can dedicate themselves to the learning process (CCSSE, 2016). Given the literature that points to the tendency of international students to dedicate more effort towards academics, it is expected that this category will be a significant predictor of international student academic achievement (Zhao et al., 2005). Eight independent variables comprise the student effort benchmark, including how often students: 1) prepared two or more drafts of a paper before submitting it, 2) integrated ideas and information from several sources to write a paper, 3) came to class without preparing, 4) used a tutor, 5) used skills lab for writing or math, and 6) used computer lab. The last two variables indicated the number of books read for personal growth outside of class, and the number of hours spent preparing for class (CCSSE, 2016).

**Support for Learners.** Items included in this benchmark characterize the actions

taken by a college to support student success through cultivating a positive educational environment in which students interact with different groups on campus (CCSSE, 2016). The support for learners benchmark is supported by several research studies that establish a significant relationship between college support variables, such as faculty, peer and advising support, to the academic success and social integration of community college students (Sandoval-Lucero & Klingsmith, 2014; Swigart & Murrell, 2001; Tovar, 2015). The seven variables in this benchmark include the degree of college emphasis on student support, diverse interactions between students, financial support, helping students cope with non-academic responsibilities, and the frequency with which students use academic advising and career counseling service (CCSSE, 2016).

**Student-Faculty Interaction.** Based on the premise that frequent interaction between students and faculty is one of the most significant influences on student engagement, the student-faculty interaction benchmark postulates that increased interaction will improve student outcomes (Chickering & Gamson, 1987). The six items included in this benchmark include how often students 1) communicated with their instructor via email, 2) discussed grades with their instructor, 3) discussed career plans with instructor or advisor, 4) discussed ideas from class material with instructors outside of class, 5) received prompt feedback from instructors on performance and , 6) worked with instructors on activities unrelated to course material (CCSSE, 2016).

**Outcome Variables.** Five outcome variables of interest were included in this study, academic achievement and sense of belonging. Academic achievement was measured by self-reported GPA (item 21 of the CCSSE), and the variable was coded so as 0 = C- or lower, 1= B- to C+, 2= A to B+. Following Lau, Garza, and Garcia's (2019)

approach, sense of belonging was categorized into three types, including sense of belonging with a) peers, b) faculty, and c) administrative personnel. These three dependent variables were obtained through CCSSE survey item 11, which measured student perceptions of their quality of relationships across the three categories. Answers ranged from a continuous 1-7 scale, with 1 representing student perceptions of these relationships as being unfriendly, unsupportive, and evoke a sense of alienation in them, and 7 representing friendly and supportive relationships, enabling students to have a sense of belonging to their institution. Coding schemes of all variables used in the analysis are presented in Table 2.

### **Data Analysis**

To answer the research questions, both descriptive and inferential statistics were used. For the first research question, descriptive statistics including frequencies and percentages were used to indicate the proportional distributions of international students according to socio-demographic and pre-college characteristics. Chi-square tests were used to examine whether proportional differences exist between these characteristics, allowing the researcher to highlight significant differences in predictor variables among international students.

**Second research question.** To determine the validity of the CCSSE benchmarks and their applicability to the international student population at community colleges, quantitative data reduction procedures were conducted on all 38 survey items. First, a confirmatory factor analysis was conducted to assess the model fit of the five CCSSE structure. Subsequently, an exploratory factor analysis was conducted that focused on forming the five-factor structure represented by CCSSE and comparing the results of

these factors to the original five CCSSE benchmarks. As part of the analysis, an examination of eigenvalues, factor loadings, cross loadings and percentage of variance explained was conducted. Subsequently, statistically significant items were given labels that match the underlying construct depicted by those sets of items. The scales produced were then subjected to a reliability test, and Cronbach's alpha coefficients for each scale were examined to determine the statistical significance and reliability of each construct. To calculate the raw benchmark scores of the constructs established through the factor analysis, this study employed the CCSSE (2014) procedures for benchmark calculations. These procedures included first converting all survey items that were confirmed to be significant in the factor analysis to a common 0-1 scale, as items in the survey have different ranges and numbers of responses. Rescaling items to a common scale ensured that the lower and upper limits of all responses were 0 and 1, respectively (Mari, 2008). Then, the raw benchmark scores were calculated by averaging the responses of the newly rescaled items under each established construct. Finally, a confirmatory factor analysis was employed on the newly established constructs in order to compare the model fit indices of these constructs with the original CCSSE structure.

**Third research question.** A multinomial logistic regression was used to determine the factors most likely to predict international students' self-reported GPA. Since the outcome variable of interest for this analysis was represented by more than two categories, multinomial logistic regression was the appropriate statistical method (Meyers, Gamst, & Guarino, 2017). Guided by the International Student Engagement Model, predictor variables were entered in their respective categories of input characteristics, consisting of background and pre-college factors, followed by socio-



ecological domains, demonstrated by the raw benchmark scores of the five CCSSE benchmarks established through the data reduction analysis.

**Fourth research question.** In the third and final phase of the analysis, a multivariate regression was applied to examine factors contributing to international students' sense of belonging. Three separate regression models were conducted to examine the relationship between the five CCSSE benchmarks and international students' sense of belonging with a) peers, b) faculty, c) academic advisors. Guided by supporting literature that highlights the role of faculty and support structures in promoting international students' sense of belonging, the two benchmarks were most appropriate to include as predictor variables for the purposes of this research question (Behroozi-Bagherpour, 2010, Glass et al., 2015). Variables were entered in sequentially in three blocks, following the tenants of the ISE model, beginning with background variables, pre-college characteristics, and the socio-ecological domains represented by the five CCSSE benchmarks of effective educational practice.

### **Limitations**

There are limitations in this study that warrant discussion. Research studies surrounding sense of belonging among international students describe its multi-faceted nature and the various psychological factors that could facilitate or impede a student's sense of belonging to an institution (Glass et al., 2018; Glass & Westmont, 2018). Since the CCSSE was the only source of information incorporated into the analysis, the study was limited based on the items that could best demonstrate sense of belonging among international students. Furthermore, the questions pertaining to sense of belonging in the CCSSE survey asked students to rate the quality of relationships with peers, instructors,

and administrative personnel. While the options for the quality of relationships peers ranged from making students feel “alienated” to making them feel a sense of belonging, the options for the quality of relationships with instructors and administrative personnel had different options. The range of options for these relationships indicated the amount of availability and helpfulness of instructors and administrative personnel. While these answers may give an idea of how much international students feel like they belong to an institution, they may not be an accurate scale to measure the full dimensions of sense of belonging among international students.

Also, the demographic section of the survey did not include any questions to identify students’ country of origin, forcing the study to group all international students into a single population. This limitation restricted the study’s ability to account for differentiating characteristics of international students from different countries that could significantly influence their academic and social experiences in community colleges.

Additionally, the self-reported nature of the survey responses limited the reliability of the CCSSE findings. Porter (2011) argued that student responses may not be accurate due to the nature of human cognition and memory retrieval which makes it difficult to accurately recall the frequency of events. Also, social-desirability bias can have a significant influence on survey responses and validity, whereby students consciously change their answers to appear in a more positive light, particularly in the case of self-reported GPA (DeMaio, 1984). Porter also described the vague wording of some CCSSE items which can also contribute to inaccurate student responses. For instance, one item asks students to rate the frequency in which students had serious conversations with peers from a different race. The exact definition of a serious

conversation was not clearly articulated, and thus could be misconstrued by students, leading to inaccurate responses (Porter, 2011). Moreover, the self-reported GPA item asked students to generally state their range of GPA, without including a specific timeframe, semester or year. This was also the case for the sense of belonging variable. The vagueness in wording of survey items could limit the ability of the study to accurately measure GPA and sense of belonging of students in a given time-period.

## Chapter IV

### Results

This chapter presents the results of the analysis corresponding to each research question. Descriptive statistics demonstrated that the majority of international students in the sample were enrolled full-time, were not married, and did not have any children. Also, a large proportion of international students were in the 20-29 age group. Findings of the data reduction analysis indicated a poor model fit of the original CCSSE benchmarks, and subsequent exploratory factor analysis resulted in constructs containing items considerably different than those contained in the original CCSSE benchmarks. Results of the multinomial regression analysis indicated that the variables of parental financial support, cognitive learning, academic tasks, and environmental support were significant positive predictors of higher GPA among international students. In terms of sense of belonging, results of all three multivariate regression models indicated that the strongest statistically significant predictor of sense of belonging with peers, faculty, and administrative personnel was environmental support.

**First Research Question: What are the socio-demographic, pre-college, and academic characteristics of international students studying at U.S. community colleges?** Table 3 presents the descriptive characteristics of the sample of international students. Females comprised 54% of the sample while males comprised 46%. The majority of international students (73.6%) enrolled full-time, and 26.4 % enrolled part-time. Of those students enrolled part-time, a significantly higher proportion were females ( $p < 0.005$ ). Most students in the sample were single (79.6%) and had no children (76.4%); however, results of the chi-square tests revealed that a significantly higher proportion of

female students in the sample were married and had children compared to male students ( $p < 0.005$ ). In terms of age, a larger number of international students lay in the younger age groups, with 57.4% of students in the 20-29 age group and 24.7% of students in the below 20 age group. Chi-square tests demonstrated a significantly higher proportion of female students in both the 40-50 and the above 50 age groups compared to male students ( $p < 0.005$ ).

In terms of pre-college characteristics, over half (57.4%) of international students in the sample required remediation in English (ESL) courses. No significant differences were found between males and females. The majority of students (74%) listed having a high school diploma as their highest academic credential. A significantly higher proportion of female students listed having more advanced degrees, including associate's and bachelor's degrees, as compared to their male counterparts ( $p < 0.005$ ). Three separate categorical variables measured the source of financial support for students, including grants/scholarships, personal income, or family income. A higher proportion of students listed parental income as a major source of financial support (39.3%), as compared to other sources.

Table 4 presents descriptive statistics of the college emphasis variables regarding various environmental aspects of the educational experience. Results demonstrate that a large percentage of students felt that their college supported students to spend significant amounts of time studying (42.4%), and 43% felt their college strongly supported student success. Approximately 38% of students felt that their college's emphasis on diverse interactions was lacking or very minimal. In this same category, 31.3% of students felt their college "very much" encouraged diverse interactions. In terms of supporting

students cope with non-academic responsibilities, 58.7% of students rated their college emphasis in this area as being “very little” or “some”, compared to 16% of students whose rating was “very much”. A high proportion of students (53.7%) viewed college emphasis on student’s thriving socially as lacking or poor. Finally, the degree of college emphasis on financial support was rated as “very little” or “some” by 49% of students.

Chi-square tests revealed significant differences between student scores on college emphasis variables by gender ( $p < 0.005$ ). In general, females seem to be more satisfied with their college’s support structure compared to their male peers. Results demonstrated that a significantly higher proportion of females (25.1%) reported that their college “very much” emphasized support for student success, as compared to only 17.8% of males. Similarly, a significantly higher number of females (18%) felt their college emphasized diverse interactions between peers “very much” compared to only 13% of their male peers.

**Second Research Question: To what extent are the five CCSSE benchmarks of effective educational practices valid constructs of international student engagement in the community college context?** A confirmatory factor analysis was conducted on the original five CCSSE benchmarks evaluate the extent to which these benchmarks are representative engagement constructs for the international student sample of 2695 students. Fit indexes for the original CCSSE structure indicated a statistically significant chi square test with a value of 7273.181,  $p < 0.005$ . The NFI (0.729), IFI (0.747), CFI (0.747), TLI (0.728), and SRMR (0.061) indicated values that collectively suggest the model was a poor fit for the data.

Subsequently, an exploratory factor analysis of all 38 CCSSE survey items was

performed to recreate the five-factor structure of the CCSSE benchmarks. As the intent of the study was to analyze the validity of the original CCSSE benchmarks and their applicability to international student populations, the five-factor framework used by CCSSE was utilized in the exploratory factor analysis. Prior to running the analysis, the data were screened by assessing descriptive statistics on each survey item to ensure no univariate or multivariate assumptions were violated. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.90, indicating that the data were suitable for principal components analysis (Kaiser, 1974). Also, Bartlett's test of sphericity was significant ( $p < 0.001$ ), signifying adequate correlation between the variables to continue with the analysis. A total of nine factors had eigenvalues greater than one, accounting for 53.6% of the total variance. Based on the subscales comprising the CCSSE benchmarks, five factors were extracted accounting for 40.6% of the total variance. An oblique rotation strategy was employed to obtain the component correlations between the items. Since an oblique rotation strategy does not necessitate the rotation process to keep factors uncorrelated, it was preferred over an orthogonal rotation strategy as the correlation matrix revealed substantial correlations between few of the factors.

Figure B.3 demonstrates the scree plot of the eigenvalues and factors extracted in the analysis. The plot indicates that the slope of the curve begins to level off at the five-factor mark, confirming the decision to use the five-factor structure as the baseline for the analysis. The five-factor structure produced by the data reduction process revealed noticeable differences between the original CCSSE benchmarks and the underlying items within each construct for international students. Differences in items associated with each factor are summarized in Table 6.

### *Academic Challenge*

Ten items were contained in the original CCSSE benchmark. For international students, only seven items loaded onto the academic challenge component. This item included the ability to synthesize, apply, analyze, and evaluate course information as well as perform and work hard. The item reflecting the extent of receiving prompt feedback from instructors was originally included in the student-faculty interaction benchmark but correlated more strongly with the academic challenge benchmark for international students. To better represent the items contained in this construct, this newly established scale was re-named *Cognitive Learning*.

### *Student Effort*

Six of the items originally included in the student effort benchmark did not load onto any factor in the case of international students. These included frequency of integrating ideas, coming to class without completing readings, and using tutoring, skills lab, and computer labs. Only the original items reflecting hours spent preparing for class a week and the amount of reading conducted by students outside of class loaded onto the student effort scale for international students. The items reflecting the number of assigned readings as well as the number of written papers or reports were originally included in the academic challenge benchmark, but correlated more strongly with the student effort benchmark for international students. This scale was renamed *Academic Tasks* to reflect the focus on time on task of academic variables represented in this construct.

### *Support for Learners*

For international students, the support for learners benchmark mainly reflected the frequency of student use of support services while the original benchmark combined



items indicating use of support services and amount of college emphasis in providing student support. Originally loaded onto the student effort benchmark, both items of frequency of use of skills labs and computer labs loaded onto the support for learners scale for international students. This scale also included items reflecting students' use of career counseling, academic advising, and tutoring services, and was renamed *Academic Support*.

#### *Student-faculty Interaction*

None of the items under the original CCSSE benchmark were reflected in the student-faculty interaction benchmark for international students. While the original benchmark contained items reflecting the amount of interaction and feedback occurring between students and their instructors, the benchmark established through the data reduction process contained items that indicated the amount of college emphasis on student support in various aspects of their college experience. The benchmark for international students contained six items, including amount of college emphasis on encouraging contact between diverse students and social interactions, encouraging studying, providing financial support, helping students cope with non-academic responsibilities, and supporting student success. Accordingly, the title of the benchmark was changed to *Environmental Support* for the international student benchmark model to better match the items reflected in this component.

#### *Active and Collaborative Learning*

Four of the items originally under the student-faculty interaction benchmark loaded onto the active and collaborative learning scale for international students. These items included the frequency of discussing grades and assignments with an instructor,

discussing ideas with instructors outside of class, discussing plans with instructors and working with instructors outside of class. The item “frequency of discussing ideas from readings with others outside of class” loaded onto the original benchmark did not load onto any factor for international students. Consistent with Nora et al.’s (2011) description, items under this scale reflect student collaboration with both peers and faculty on class-work and assignments, and was accordingly renamed *Collaborative Learning*.

Subscales of the benchmarks for international students were constructed based on the organization of items shown in Table 5. The internal consistency of each subscale was evaluated by the corresponding Cronbach’s alpha coefficient, displayed in Table 7. All subscales demonstrated good internal consistency with the exception of the academic tasks scale which had a low Cronbach’s alpha coefficient of 0.57. The academic support scale had a moderate internal consistency value of 0.68.

A second confirmatory factor analysis was conducted to confirm the model fit of the established structure resulting from the exploratory factor analysis. The values for NFI (0.776), TLI (0.776), CFI (0.747), though indicated improved values from the original CCSSE benchmarks, still indicate that the model represented an inadequate fit of the data. The Standardized Root Mean Square Residual (SRMR) value was reduced to 0.057 in the new structure, also representing a better fit in the model resulting from the exploratory factor analysis.

Table 8 presents the descriptive statistics, including means and standard deviations, of the newly constructed scales for international students. Results demonstrate that international students scored the lowest on the collaborative learning scale, followed

by environmental support, academic tasks, cognitive learning, and academic support.

**Third Research Question: What is the relationship between the newly constructed five CCSSE benchmarks of effective educational practices and the academic achievement of international students in community colleges?** A multinomial logistic regression was used to predict the range of self-reported GPA scores of international students in the sample. Three dependent variables, A to B, B- to C+, and C or lower, were represented. The range C or lower was used as the reference category to assess which variables predicted higher scores among students. Variables were entered into the model according to the domains of ISE model, beginning with socio-demographic variables, pre-college characteristics, followed by socio-ecological domains. The socio-ecological domains were represented by the newly constructed scales for international students, including cognitive learning, environmental support, academic tasks, collaborative learning, and academic support.

Table 9 displays results of the multinomial logistic analysis, including the regression coefficients, Wald tests, and the adjusted odds ratio. Additionally, the 95% confidence intervals for odds ratios associated with each predictor variable were included, which contrasted the GPA range of A to B with the reference group of C or lower in the upper portion of the table. The odds ratio contrasting the GPA range of B- to C+ with the reference group are presented in the lower portion of the table. Results demonstrated that the fifteen-predictor model provided a statistically significant prediction of GPA scores  $\chi^2 = 186.082$  (44,  $n = 2,695$ ),  $p < 0.001$ . The Nagelkerke pseudo  $R^2$  showed that the model accounted for 8.3% of the total variance in GPA scores. After controlling for socio-demographic and pre-college characteristics, findings

demonstrated that students who relied on their parents for the majority of their financial support were 1.588 times more likely to score a GPA between A to B, as compared to C or below ( $p < 0.005$ ).

In terms of socio-ecological domains, the newly constructed benchmarks of academic challenge and student effort were statistically significant positive predictors of higher GPA scores among international students. A one-unit increase in a student's academic challenge score increased the odds of scoring a GPA between A to B by 8.399 as compared to scoring C or lower ( $p < 0.001$ ). Similarly, the odds of scoring a GPA between A and B, rather than a C or lower, were 7.19 times greater for students with each unit increase in their student effort benchmark score ( $p < 0.005$ ).

For the GPA range of B- to C+, the only statistically significant positive predictor was the socio-ecological variable of environmental support. The odds of scoring a B- to C+, rather than a C or lower, were 4.448 times higher for students with each unit increase in their environmental support benchmark score, controlling for their scores in the four benchmark categories, as well as their socio-demographic and pre-college variables.

**Fourth Research Question: What is the relationship between the newly established CCSSE scales for international students and sense of belonging with peers, faculty and administrative personnel?**

Since the results of the data reduction procedures established a new scale that was renamed "environmental support," the student faculty interactions benchmark was replaced with the newly constructed scale for international students. Three separate multivariate regression models were conducted to measure the relationship between the five newly established scale scores and sense of belonging with a) peers, b) faculty, and

c) administrative personnel. Variables were entered in three consecutive blocks, beginning with socio-demographic characteristics, pre-college factors, and finally the socio-ecological domains represented by the newly constructed scales.

Results of the multivariate regression model measuring sense of belonging among peers are presented in Table 10. The change in R square reflected significant improvement in the explanatory power of the independent variables across all three model iterations, increasing from 0.001 in the first model to 0.133 in the fourth and final model ( $p < 0.005$ ). In terms of pre-college characteristics, requiring remediation in English was associated with lower sense of belonging among peers scores by 0.022 points after controlling for socio-demographic and socio-ecological domains ( $p < 0.05$ ). Four of the five newly established scales were significant positive predictors of sense of belonging among peers, the strongest being environmental support followed by collaborative learning, cognitive learning, and academic support. Environmental support had a significant effect on sense of belonging among peers, increasing students' sense of belonging scores by 0.282 units with each increase ( $p < 0.005$ ).

Results demonstrating factors predicting international students' sense of belonging with faculty are presented in Table 11. The R square change across all four model iterations indicated a greater increase in the explanatory power of the variables compared to the previous model, represented by a change in the adjusted R square value from 0.009 in the first block to 0.164 in the fourth and final block. The final model revealed that parental financial support was a significant predictor of sense of belonging with faculty, indicating that students who did not rely on parental income as a major source of support had lower sense of belonging scores with faculty than students who

relied on parental income as a major score of support ( $p < 0.05$ ). In terms of socio-ecological variables, three of the scales were significant positive predictors of sense of belonging with faculty. The strongest predictor was, again, environmental support, followed by cognitive learning and academic support. The environmental support benchmark increased student sense of belonging scores by 0.336 units with each unit increase ( $p < 0.005$ ) after controlling for socio-demographic and pre-college characteristics. In contrast to the results of the previous model, collaborative learning had a significant *negative* impact on sense of belonging with faculty, decreasing students' scores by 0.058 units with each unit increase ( $p < 0.05$ ).

Results demonstrating factors predicting international students' sense of belonging among administrative personnel are presented in Table 12. For this aspect of sense of belonging, several socio-demographic characteristics were significant predictors, including gender, marital status, and having children. Females were more likely to report lower scores of sense of belonging among administrative personnel compared to their male counterparts ( $p < 0.005$ ). Being married had a significant positive effect on sense of belonging among administrative personnel while presence of children had a negative effect after controlling for pre-college and socio-ecological variables ( $p < 0.05$ ). Similarly, environmental support was the strongest predictor of sense of belonging with administrative personnel, increasing student scores by 0.482 units with each unit increase ( $p < 0.005$ ). Academic support and academic tasks were also significant positive predictors with support for learners being the stronger predictor of the two, increasing sense of belonging scores by 0.127 points with each unit increase after controlling for socio-demographic, pre-college, and socio-ecological variables ( $p < 0.05$ ).

In conclusion, the results highlight the differences between items contained in the original CCSSE structure and the newly established scales for international students. Regression results also emphasize the low explanatory power of the newly established scales in explaining the variance in GPA indicated by the low R squared value. Lastly, results highlight the importance of environmental support in predicting sense of belonging with peers, faculty and administrative personnel.

## Chapter V

### Discussion & Implications

Findings from this study confirm that engagement in educationally purposeful activities does in fact differ for international students at community colleges, relative to their domestic peers. This difference largely stems from the characteristics and experiences of these students that shape their interaction with their educational environment, and are unaccounted for in the current CCSSE structure. These findings support the growing awareness of the need to account for the negative pressures endured by students of various cultures and backgrounds that may impact the way they engage in the different facets of their educational experiences (Dowd, Sawatzky, & Korn, 2011; Nuñez, 2009; Tanaka, 2002). For instance, Tanaka (2002) described that the student effort benchmark, defined as the quantity of effort students invest in educational activities while taking into account how much they capitalize on institutional resources, overestimates the importance of student effort while dis-regarding the negative effects of campus culture on students who are not part of the mainstream campus culture. Several studies have noted the negative effects of acculturative stress, isolation, discrimination and language barriers on the academic success and integration of international students (Moore & Popadiuk, Ng, 2006; 2011; Yeh & Inose, 2003). In addition, international students often feel alienated from the mainstream campus culture due to the lack of interest expressed by domestic students in forming friendships with them (Zhang & Burton, 2007). Given these challenges, a culturally neutral method of defining engagement in educationally purposeful activities is particularly detrimental to studying



international student populations, whose sense of belonging is largely determined by their campus environment (Glass & Westmont, 2018).

Results also indicated that environmental support was consistently the strongest predictor of international students' sense of belonging among peers, faculty and administrative personnel. Among the items included in the environmental support benchmark were the extent to which the college emphasized diverse interactions between peers, degree of college emphasis on student success, and student support in non-academic issues. Garcia et al.'s (2019) study investigating factors predicting international students' sense of belonging also found that the latent construct of socio-academic integration, consisting of items included in the environmental support benchmark, was the strongest predictor of sense of belonging. These findings corroborate previous studies highlighting the role of the campus environment, including faculty support, campus support services, and academic advising on international students' sense of belonging (Behroozi-Bagherpour, 2010; Glass & Westmont, 2014; Glass et al., 2018, Lau et al., 2019). Also, results support prior research emphasizing the role of social and ecological contexts in promoting cross-cultural-interactions that contribute to international students' sense of belonging (Osterman, 2000; Pan, 2011). Considering the scholarly evidence of the positive impact of international students' sense of belonging on their engagement, satisfaction and academic achievement, it is clear from the results of this study that sense of belonging is an important constituent of international student engagement that supports their resilience through college (Garcia et al., 2018; Kashima & Loh, 2006; Pan, 2011).

Furthermore, while results of the regression models indicated a positive association between environmental support and the academic support scales and sense of

belonging of international students, the collaborative learning scale was found to be a significant negative predictor of sense of belonging with faculty. This could be explained by the negative impact that language barriers and second language anxiety can have on the ability of international students to actively participate in class discussions and interact with peers and faculty (Banjong, 2015; Chen, 1999; Gallagher, 2012; Smith & Khawaja, 2011). Campbell (2007) found that international students often feel intimidated by native English speakers who dominated class discussions, further contributing to their feelings of isolation.

International students often fear that language difficulties would cause them to lose face in front of peers and faculty, causing them to take too long to answer questions and form complete sentences (Warden, Chen, & Caskey, 2005). Such difficulties are sometimes frowned upon or mocked by peers or faculty lacking intercultural understanding, which could contribute to the negative association between active and collaborative learning and sense of belonging with faculty (Campbell, 2007). In addition, literature on international student engagement and sense of belonging highlight the significant role of faculty in exhibiting emotional cues that signal inclusion or exclusion of international students (Glass et al., 2015). International students consider faculty to be their primary source of academic and social support, and their sense of belonging was largely determined by the extent to which instructors demonstrated inclusive classroom practices and promoted equitable classroom discussions (Campbell, 2007; Glass et al., 2015). The negative association between collaborative learning and sense of belonging with faculty is both supported by these findings and confirms the role of faculty in creating inclusive, comfortable spaces where international students view participation as

either a positive or negative experience.

Results of the multinomial regression analysis demonstrates that the impact of international student engagement on successful academic outcomes conflicts with previous findings by CCSSE (e.g. McClenney & Marti, 2006). While validation research conducted by CCSSE highlights the strong predictive ability of the five benchmarks and student outcomes such as GPA and persistence, results from this analysis indicated that the newly established scales only explained 8.3% in the variance in the GPA of international students. Also, results from the CCSSE validation research conducted on three diverse data sets examining the impact of CCSSE benchmarks on a variety of student outcomes found that active and collaborative learning, student effort and academic challenge were consistently significant positive predictors of GPA across all datasets, (McClenney & Marti, 2012). In this study, academic challenge, student effort, and environmental support were found to be significant positive predictors of higher GPA scores among international students, further demonstrating discrepancies between findings reported by CCSSE and those found by other researchers (e.g. Angell, 2009; Nora et al., 2011). The low explanatory power of the CCSSE benchmarks confirms findings by Nora et al. (2011) that found the five CCSSE benchmarks explained only 10.3% of the variance in GPA after controlling for socio-demographic characteristics. These results not only present a limitation to this study, but also shed light on the possibility that there may be a broader range of factors left out of the CCSSE benchmarks and the items underlying them that could better explain the variance in the academic success of students from various cultural backgrounds (Dowd, Sawatzky, & Korn, 2011; Nuñez, 2009; Tanaka, 2002).

The results from this analysis confirm the inapplicability of the original five CCSSE benchmarks as valid constructs for international student populations, evident through the poor model fit statistics resulting from the initial confirmatory factor analysis. Findings from the subsequent exploratory factor analysis revealed that the latent constructs underlying the 38 items in the CCSSE survey were considerably different for international students. The analysis yielded the following conclusions: 1) Data reduction analysis derived items representing the latent construct of academic challenge (renamed cognitive learning) that were considerably different than those in the original CCSSE benchmark. 2) All items under the student-faculty interaction scale did not load onto a single factor. Rather, one loaded onto the cognitive learning scale and the remaining items loaded onto the collaborative learning scale. 3) While the original support for learners benchmark included both environmental support and institutional support items, the factor analysis derived two separate constructs. 4) The resulting five-factor structure consisted of the following five constructs: cognitive learning, collaborative learning, academic tasks, environmental support, and academic support. 5) The model fit indices of the newly established constructs did indicate an improvement from the original CCSSE structure, but still fell short of the guidelines for an adequate model fit.

Results support previous findings by Nora et al. (2011), which conducted data reduction analysis of the five CCSSE structure using a population of domestic students of whom the majority were White, Hispanic, and African American. The study found significant differences between the constructs derived through factor analysis and the original CCSSE benchmarks. Similarly, the study found that the items under the student-faculty interactions benchmark did not load onto a single factor, but rather loaded onto

other factors including active and collaborative learning (Nora et al., 2011). Additionally, results of García et al.'s (2019) data reduction analysis yielded items in the socio-academic construct that matched those items included in the environmental support benchmark in the present study.

The items loaded onto the newly constructed academic challenge scale (renamed cognitive learning) included items originally correlated with the active and collaborative learning and student-faculty interaction benchmarks of the CCSSE structure. These findings further bring light to the notion that what constitutes academic challenge for a domestic student may not be the same for an international student. For example, while using email to communicate with an instructor and receiving feedback from instructors on performance were both items originally included in the student-faculty interaction benchmarks of the original CCSSE benchmarks, they were both considered to be an academic challenge for international students. Similarly, asking questions and contributing to class discussions was viewed as an academic challenge for international students, although it was part of active and collaborative learning in the original CCSSE structure. These results are confirmed by studies that demonstrate the challenges that international students have in participating in class discussions and communicating with faculty due to language barriers, differences in teaching and learning styles, and acculturative stress among other factors (Mamiseishvili, 2012; Pederson, 1991; Yu & Shen, 2012).

The lower than desired model fit indices for the newly constructed scales indicate that the 38 CCSSE survey items may not be an adequate representation of these underlying constructs for international students. These findings provide more evidence of

the growing need to include more culturally relevant variables in student engagement assessment tools and to revise the concepts underlying these assessment instruments to include a wider range of factors that influence the success and experiences of students from different cultures and backgrounds, including sense of belonging, cultural inclusivity, and validation (Harper, 2009; Hurtado & Carter, 1997; Museus & Quaye, 2009; Nuñez, 2009). While studies investigating the misspecification of engagement constructs mostly focus on minority and under-represented student populations, it is important to recognize the dearth of literature on the topic of international student engagement constructs and draw from existing literature on minority populations as a first step towards expanding scholarly work in this area. Despite the need to focus on cultural relevance and inclusivity among students of all backgrounds in examining engagement constructs, international students are a unique population whose experiences and challenges set them apart from domestic students (Hagedorn & Lee, 2005; MacIntyre & Gardner, 1994). Factors that may strongly influence the academic success and sense of belonging of international students may not be the same for domestic students, due to the vast differences in learning styles, cultural values and stressors between these students (Chen, 1999; Yu & Shen, 2012).

Additionally, the results found by this study and others (e.g. Angell, 2009; Mandarino & Martin, 2008; Nora et al., 2011) demonstrating poor construct reliability, and differences in items loaded onto each factor as compared to those included in the original CCSSE benchmarks, raise serious questions about the validity of these constructs. As Angell (2009) described in relation to the CCSSE survey: “Nationally validated instruments often lend a false sense of security to local users, and their use

might be inappropriate” (p.7). Along those lines, the use of CCSSE benchmarks as a proxy for student success could be risky to use for the purpose of informing policy or practice when the data itself is flawed in accurately measuring student engagement constructs (Nora et al., 2011).

Figure 2 displays the International Student Engagement (ISE) model with the re-established CCSSE scales. Viewing the results through the lens of the conceptual framework, it is evident that the interplay between the socio-ecological domains, pre-college factors and socio-demographic characteristics of international students did have observable effects on both the GPA and sense of belonging on international students (Harris & Wood, 2016). Coherent with the premise of the non-cognitive domain of the ISE model, active and collaborating learning of international students is affected by their social and cultural values, particularly for students from collectivist cultures (Edgeworth & Eiseman, 2007; Misra et al., 2003). Students who are socialized in cultures where learning is more stringent and less focused on in class discussion may have a difficult time adapting to Western styles of teaching, which often contributes to a sense of isolation and lack of sense of belonging with faculty (Misra et al., 2003).

In addition, the ISE model also demonstrates the interplay between background variables, socio-cultural forces, and the socio-ecological domains on international student outcomes. Results of this study highlight that active and collaborative learning was negatively associated with sense of belonging among faculty, supporting literature that highlights the negative impact of language barriers and second language anxiety on the sense of belonging of international students (Chen, 1999; Zhang, 2017). Results also demonstrate the impact of parental financial support on international students’ sense of

belonging with faculty, showing that students who did not rely on parents for financial support were more likely to have a lower sense of belonging with faculty. This finding could be explained by research noting that international students supported financially by their parents generally made extra efforts to interact with faculty and perform well due to external pressures to impress their parents whose income they rely on (Anayah & Kuk, 2012). Moreover, studies have shown that family influence and support are two of the major factors determining a students' decision to study abroad in a community college (Anayah & Kuk, 2012). Despite the fact that many families supporting their children are middle-class and struggle to afford the expenses of international education, it is more likely that these families are of a higher socio-economic status than families of students who do not rely on parents for financial support (Anayah & Kuk, 2012; Sherri, Thomas, & Chui; 2009), further supporting the conceptual framework's hypothesis of the relationship between socio-cultural and background variables and international student outcomes.

The ISE model proposes that international student engagement does not occur in a vacuum but is influenced by a variety of background and socio-ecological characteristics that influence students' perceptions and emotional responses to the different learning channels of their institution, which subsequently impacts their academic achievement and sense of belonging. The model highlights the psychosocial aspect of engagement that includes attitudes, perceptions and emotional responses, along with the behavioral aspect. This psychosocial aspect of student engagement, while included in some definitions of student engagement (e.g. Saloman & Globerson, 1987; Schuetz, 2008), is lacking in the way student engagement is defined and characterized through the CCSSE benchmarks.



Relying primarily on Chickering and Gamson's (1987) seven principles of educational practices, the five CCSSE benchmarks focus on behavioral components including time on task and frequency of participation in educational activities inside and outside of the classroom. This over-emphasis on the behavioral aspect of student engagement fails to present a more holistic perspective of student engagement, particularly for students from different cultures and backgrounds (Dowd et al., 2011; Nora et al., 2011). Findings from this study underscore the ISE model's hypothesis that international student engagement has more to do with their challenges, perceptions, and socio-cultural values that drive their behaviors towards participating in educational activities than just the behaviors themselves.

### **Recommendations for Policy and Practice**

Given this study's findings of the importance of environmental support on international students' sense of belonging with peers, faculty, and administrative personnel, the recommendations offered in this section include ways in which community college leaders, student affairs professionals, and faculty can collectively improve facets of the educational environment that have been empirically proven to have a positive influence on international student success. To begin with, one of the most important ways that educational leaders can better support international students is by encouraging instructors, academic advisors, and student affairs professionals to learn more about international students, their cultures, backgrounds, and challenges through international student support training (Quaye & Harper, 2014). Such training would enable instructors and staff to personify a global consciousness, developing an appreciation and awareness of cultural diversity as well as learning to be sensitive to and understanding of the needs

of these students.

Also, given the significant role of faculty in creating diverse, comfortable classroom environments for international students, international student support training should include methods through which instructors can better engage international students in class through a variety of new approaches (Campbell, 2007; Glass et al., 2018; Marlina, 2009). Instructors who demonstrate intercultural competence, exhibit genuine concern for the well-being and academic success of international students, and promote equitable and diverse classroom dialogue can significantly increase the sense of belonging of international students (Glass, 2012; Glass & Westmont, 2014; Glass et al., 2018). As noted by Marlina (2009), oftentimes the reluctance of international students to participate in class discussions stems from the instructor rather than the students themselves. A way to encourage international students to participate would be to invite them to share their own experiences and challenges and to incorporate culturally relevant literature in class material and discussions (Ladson-Billings, 1995; Marlina, 2009; Quaye & Harper, 2014). Furthermore, Campbell (2007) found that online discussion assignments can be a very effective way of enhancing international student participation in class discussions. Online discussions free international students from the constraints of time during face-to-face discussions and enable them to gather their thoughts and prepare their answers in a way that avoids the fear of losing face in front of domestic peers and faculty (Sullivan, 2002). Also, language barriers are less likely to limit their participation during an online discussion in the same way that it can face-to-face (Campbell, 2007). However, instructors must ensure that international students feel that their thoughts and contributions are valued, even in an online forum, to encourage consistent participation

and foster students' sense of inclusion (Campbell, 2007).

Moreover, given both this study's findings of the importance of environmental support, including the emphasis on promoting diverse interactions between students, it is recommended that community college leaders and student affairs professionals establish effective ways for international and domestic students to have meaningful interactions (Chang et al., 2005). Implementing peer mentoring programs, whereby more advanced domestic students are paired with new international students to provide support and help navigating through campus resources is a useful way for international students to build social networks upon arriving to the U.S. (Quaye & Harper, 2014; Stebelton et al., 2010). Pairing new international students with more advanced fellow international students can also be a beneficial way to forge connections with students who have been through similar experiences and thus can provide emotional support, alleviating some of the isolation and loneliness that new international students are prone to experience (Banjong, 2015; Garcia et al., 2018; Sawir, Marginson, Deumert, Nyland, & Ramia, 2008; Stebelton et al., 2010).

In addition to increased inter-cultural competence among community college staff and faculty and implementing peer mentoring programs, community colleges are encouraged to create campus-wide strategies that connect key departments with the purpose of extending outreach efforts and enhancing international student support services (Zhang, 2017). Though international student offices provide guidance to students on navigating campus resources, visa applications, and admission procedures, this support generally does not continue after their arrival period (Dodge, 2015). Quaye and Harper (2007) describe that many international students are unaware of the different

support services available to them, specifically since these services many not exist in colleges in their home countries. For this reason, student affairs staff should be more intentional in educating students about the variety of support services offered in the college and aid them in seeking out this support when they need it.

This study also highlighted the importance of support for learners, including academic advising, as a significant positive predictor of sense of belonging among administrative personnel. Research has found that one of the most common complaints from international students' is poor guidance from academic advisors, who oftentimes fail to explain the necessary curricular requirements and transfer policies that domestic students may be more familiar with (Behroozi-Bagherpour, 2010; Dowd & Bensimon, 2013). These findings confirm that a one-size all approach to student support may not be the best technique in guiding international student populations and may require enhanced efforts and inter-cultural training on the part of academic advisors and international support staff (Quaye & Harper, 2014). Dowd and Bensimon (2013) highlighted the importance of hiring specialized transfer agents that provide tailored support and clearly communicate transfer requirements to community college students who were unaware or felt overwhelmed by the transfer process. Providing this extra step in student support proved to be a great help in enlightening international students about curricular requirements and expressed to students a genuine concern for their academic success (Dowd & Bensimon, 2013).

Although many U.S. colleges and universities use the word "internationalization" to exhibit the prestige of their institutions, most of the time the way internationalization is employed is through the number of international students recruited (Quaye & Harper,

2014). Even though a large number of international students is indicative of an internationalized institution, recruiting a large number of tuition-paying students from overseas without catering to their needs, cultural values, challenges, and perspectives defeats the basic purpose of internationalization. Cultural centers, an important way to celebrate and make students of all backgrounds feel comfortable, are most often concentrated on the needs of domestic students of color, which could make international students feel unwelcome (Constantine et al., 2005). Therefore, it is important to increase the role of cultural centers to cater more towards international student populations and create more understanding between students of color and international students (Quaye & Harper, 2014).

### **Directions for Future Research**

Findings from this study emphasize the inadequacy of CCSSE benchmarks and their underlying items at representing the engagement of international students. In addition, results portray the low explanatory power of CCSSE benchmarks in predicting the GPA of international students, supporting findings by Nora et al. (2011). These results confirm the need to reassess items contained in student engagement assessment tools, particularly in the community college context, to include more culturally relevant items including sense of belonging, validation, and cultural inclusivity (Harper, 2009; Hurtado & Carter, 1997; Museus & Quaye, 2009; Nuñez, 2009). Nora et al.'s (2011) findings also suggest that relying on behavioral aspects of student engagement, without regarding the cultural aspects and perspectives motivating these behaviors, may prevent engagement benchmarks from providing a holistic view of the engagement of students from different cultural backgrounds (Dowd et al., 2011). Benchmarks of effective

educational practice can support student learning yet simultaneously lack cultural relevance (Yosso, Smith, Ceja, & Solórzano, 2009). For this reason, relying solely on CCSSE benchmarks as indicators of student engagement and international student success in community college is not recommended (Angell, 2009).

A more holistic way of approaching research on this topic would be accompanying these assessment instruments with more qualitative input from students (Quaye & Harper, 2014). Institutions wishing to better engage international students should establish regular methods to hear students' opinions and collect information about the nature of their experiences and challenges in order to better understand emerging patterns in their behaviors (ACPA & NASPA, 2004). In addition, community colleges should invite international students to share their advice on how different aspects of the campus climate can be improved to better serve their needs. Collecting accurate data from students' perspectives and including them in decision making can be a valuable tool in increasing international students' sense of belonging and overcoming barriers to their engagement (Harper, 2011).

Finally, results from this study also confirm the need to advance research on international student engagement and sense of belonging in the community college context (Garcia et al., 2019; Hagedorn & Lee, 2005; Zhang, 2017). This study is among the few to examine the validity of CCSSE benchmarks as predictors of academic achievement and sense of belonging among international students; therefore, more research is necessary to advance knowledge on the factors contributing to international student success. Garcia et al.'s (2019) study has pioneered these research efforts by creating a model for predicting international students' sense of belonging that is not

constrained by the limits of CCSSE benchmarks. This line of research can begin to build a strong empirical literature base that could inform policy changes and institutional actions aimed at creating a more satisfying and successful educational experiences for international students (Zhang, 2017).

### **Conclusion**

This study confirms the important role of sense of belonging to the success and engagement of international student populations. In addition, results suggest that using pre-defined items to measure international student engagement and success may be ill-conceived. Community college leaders and student affairs practitioners are encouraged to use the recommendations provided by this study as a starting point to re-assess their curricular and co-curricular components to help provide more inclusive and welcoming campus climates for international students. Furthermore, educational researchers investigating international student engagement in the community context are strongly encouraged to collect and use data from students' vantage points in order to better understand nuances in their experiences and challenges. International students are an extremely valuable asset to community colleges, as increasing enrollments enrich the diversity, inter-cultural understanding, and global repertoire of these institutions. Given these benefits, it is paramount for community college leaders to invest in providing greater support to allow these students to thrive both personally, and academically.

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**Appendix A**

**Tables**

**Table A1***Description of CCSSE benchmarks and item response scales*

Benchmark	Description of items and response scales
Active and collaborative learning	<p>Contained seven survey items. A four-item response scale (Never, Sometimes, Often, Very Often) measured the frequency of the following college activities:</p> <ul style="list-style-type: none"> <li>• Made a class presentation</li> <li>• Asked questions or participated in class discussions</li> <li>• Worked with students on a project in class</li> <li>• Discussed ideas from class readings with others outside of class</li> <li>• Participated in a community-based project as part of coursework</li> <li>• Tutored other students</li> </ul>
Academic challenge	<p>Contained ten survey items. A four-item response scale (Very little, Some, Quite a Bit, Very Much) measured the extent to which students did the following four activities:</p> <ul style="list-style-type: none"> <li>• Analyzed basic ideas of an element of theory</li> <li>• Synthesized and organized ideas in new ways</li> <li>• Make judgements about the soundness of information</li> <li>• Apply information to perform a new skill</li> </ul> <p>A five-item response scale (None, 1 to 4, 5 to 10, 11 to 20, more than 20) was used to measure the following two items:</p> <ul style="list-style-type: none"> <li>• Number of written papers or reports</li> <li>• Number of assigned readings, textbooks, or manuals</li> </ul> <p>A seven-item continuous response scale (1 = extremely easy, 7= extremely challenging) was used to measure the extent to which exams have challenged students to do their best work</p>
Student effort	<p>Contained eight survey items. A four-item response scale (Never, Sometimes, Often, Very Often), measured the frequency of the following six activities:</p> <ul style="list-style-type: none"> <li>• Prepared two or more drafts of a paper before submission</li> <li>• Worked on a paper that required integrating ideas from various sources</li> <li>• Came to class without completing readings or assignments</li> <li>• Used peer or other tutoring</li> <li>• Used skills lab (writing, math, etc.)</li> </ul>

	<ul style="list-style-type: none"> <li>• Used computer lab</li> </ul> <p>A five-point scale (None, 1 to 4, 5 to 10, 11 to 20, More than 20) measured the following activity:</p> <ul style="list-style-type: none"> <li>• Number of books read on your own (not assigned)</li> </ul> <p>A six-point scale (None, 1-5, 6-10, 11-20, 21-30, More than 30) measured the following activity:</p> <ul style="list-style-type: none"> <li>• Number of hours spent preparing for class in a 7-day week</li> </ul>
Support for learners	<p>Contained seven survey items. A four-point response scale (Very Little, Some, Quite a bit, Very Much), was used to measure the extent of college emphasis on the following five items:</p> <ul style="list-style-type: none"> <li>• Providing students with support to succeed in college</li> <li>• Encouraging contact among diverse students</li> <li>• Helping students cope with nonacademic responsibilities</li> <li>• Providing students with support to thrive socially</li> <li>• Providing financial support</li> </ul> <p>A four-point response scale (Don't know/N.A., Rarely/Never, Sometimes, Often), was used to measure the frequency of the following activities</p> <ul style="list-style-type: none"> <li>• Use of academic advising/planning services</li> <li>• Use of career counseling services</li> </ul>
Student-faculty interaction	<p>Contained six survey items. A four-point response scale (Never, Sometimes, Often, Very Often) was used to measure the frequency of the following student activities:</p> <ul style="list-style-type: none"> <li>• Used email to communicate with an instructor</li> <li>• Discussed grades or assignments with an instructor</li> <li>• Discussed career plans with advisor or instructor</li> <li>• Discusses courses readings and ideas with instructors outside of class</li> <li>• Received prompt feedback from instructors on performance</li> <li>• Worked with instructors on activities unrelated to coursework</li> </ul>

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**Table A2***List of variables and coding scheme*

Variables	Coding Scheme
<b>Predictors: Background characteristics</b>	
Gender	0 = male, 1 = female
Age	0 = < 20, 1 = 20-29, 2 =30-39, 3=40-50, 4=>50
Married	0 = yes, 1 = no
Presence of children	0 = yes, 1 = no
<b>Predictors: Pre-college characteristics</b>	
Enrollment status	0 = part-time, 1 = full-time
Developmental English (ESL)	0 = not required, 1 = required
<b>Predictor: Socio-ecological domains</b>	
Active and collaborative learning	Continuous (scale) raw benchmark score
Academic challenge	Continuous (scale) raw benchmark score
Student effort	Continuous (scale) raw benchmark score
Support for learners	Continuous (scale) raw benchmark score
Student-faculty interaction	Continuous (scale) raw benchmark score
<b>Outcome Variables</b>	
GPA	0 = A-B, 1 = B- to C+, 2 = C or lower
Sense of belonging	Continuous

**Table A3***Descriptive Statistics for the Sample*

<i>Variable</i>	<i>Sample Representation (%)</i>
<i>Full Sample (6,015)</i>	
<i>Age</i>	
< 20	24.5
20-29	57.0
30-39	11.0
40-50	4.6
>50	2.2
<i>Gender</i>	
Male	46.0
Female	54.0
<i>Marital Status</i>	
Married	20.4
Single	79.6
<i>Children</i>	
Yes	23.6
No	76.4
<i>Enrollment</i>	
Part-time	26.4
Full-time	73.6
<i>ESL</i>	
Not required	42.6
Required	57.4
<i>Financial Support- Personal Income</i>	
Major source	31.9
Not a major source	68.1
<i>Financial Support- Parent/Family income</i>	
Major source	39.3
Not a major source	60.7
<i>Financial Support- Grants/scholarships</i>	
Major source	36.3
Not a major source	63.7



**Table A4***Descriptive Statistics: College Emphasis Variables*

<b>College Emphasis Variable</b>	<b>Very Little (%)</b>	<b>Some (%)</b>	<b>Quite a bit (%)</b>	<b>Very Much (%)</b>
College emphasis on encouraging students spend significant amounts of time studying (ENVSCHOL)	3.2	17.0	37.1	42.4
Male	1.6	9.1	19.1	16.3
Female	1.6	8.2	18.1	26.1
College emphasis on providing students support for their success (ENVSUPRT)	4.1	16.7	35.3	42.1
Male	2.0	8.2	18.0	17.8
Female	2.2	8.8	18.0*	25.1*
College emphasis on encouraging contact among students from different backgrounds (ENVDIVRS)	12.5	25.1	31.1	31.3
Male	5.5	12.0	15.2	13.3
Female	7.0	13.1	15.9	17.9*
College emphasis on helping students cope with non-academic responsibilities (ENVNACAD)	28.2	30.6	25.3	16.0
Male	12.8	14.7	12.0	6.6
Female	15.4	15.9	13.2	9.4*
College emphasis on providing students with support needed to thrive socially (ENVSOCAL)	18.6	35.1	28.0	18.3
Male	8.2	17.1	13.0	7.8
Female	10.5	18.0	15.0	10.5
College emphasis on providing financial support (FINSUPP)	27.6	21.5	22.4	28.6
Male	12.8	10.4	11.2	11.6
Female	14.8	11.1	11.2	17.0*

**Table A5***International Student Engagement Model Constructs*

<b>Construct</b>	<b>Applicability to International Students</b>
<b><i>Background/Defining Factors</i></b>	
Age	<ul style="list-style-type: none"> <li>Majority of students enter college at a younger age than domestic students (Hagedorn &amp; Lee, 2005; García et al; 2018; Mamiseishvili, 2012).</li> </ul>
Gender	<ul style="list-style-type: none"> <li>Some studies have found that international female students have more difficulty assimilating to the new educational environment compared to males, particularly those from collectivist cultures (Lin &amp; Yi, 1997; Oldstone-Moore, 2002).</li> <li>Could negatively impact academic progress and achievement (Hseih, 2006; Crisp &amp; Nunez, 2014)</li> </ul>
Marriage and Children	<ul style="list-style-type: none"> <li>Majority of international students studying in U.S. community colleges are single (Hagedorn &amp; Lee, 2005)</li> <li>Married international students experience less acculturative stress than single students as they have more social support (Poyrazli, Kavanaugh, Baker, &amp; Timimi, 2004). Social support is positively related to international students' academic progress (Glass &amp; Westmont, 2014).</li> </ul>
Enrollment Status	<ul style="list-style-type: none"> <li>Majority of international students are enrolled full-time due to visa stipulations. (Open Doors, 2017).</li> </ul>
<b><i>Societal Factors</i></b>	
English Language Proficiency	<ul style="list-style-type: none"> <li>Language difficulties are one of the most cited factors in the literature on international student experiences (Banjong, 2015; Furnham &amp; Alibhai, 1985; Smith &amp; Khawaja, 2011).</li> <li>Second language anxiety can impede international students' ability to interact with domestic peers and faculty (Chen, 1999; Zhang, 2017).</li> <li>Many international students are attracted to community colleges due to their increased focus on building English language skills through ESL courses (Bailey &amp; Weininger, 2002; Blumenthal, 2002; Kegel, 2009).</li> </ul>

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## Financial Support

- International students enrolling in community colleges mostly come from middle class families who work hard to support their children's education abroad (Anayah & Kuk, 2015).
- The majority of students rely on their families as their major source of financial support (Open Doors, 2017) International students are not eligible for any form of federal financial aid, and visa stipulations require students to enroll full-time also restrict their work eligibility (IIE, 2018). As a result, students are pressured to maintain their full-time status and perform well academically while also struggling to find suitable employment that could help provide extra financial support (Hagedorn & Lee, 2005). These factors add to the challenges that international students face while adapting to their new educational experience.

## *Socio-ecological Domains*

### Noncognitive Domain

- Active & Collaborative Learning

- Positive effect of cross-cultural interactions with peers and faculty on the academic success and sense of belonging of international students (Behroozi-Bagherpour, 2010; Glass & Westmont, 2014; Glass et al; 2015).
- Effect of socialization and cultural values is important to consider in international student populations, particularly those from collectivist cultures (Misra et al., 2003). These values may affect the way students participate in class discussions and interact with domestic peers and faculty (Edgeworth & Eiseman, 2007; Yu & Shen, 2012)

### Academic Domain

- Student Effort
- Academic Challenge
- Student Faculty Interaction

- International students dedicate more effort on non-interactive academic engagement activities compared to domestic students, particularly in their first year (García et al, 2016; García et al, 2018)
- International students, on average, perform better academically than domestic students (Hagedorn & Lee, 2005; Mamiseishvili, 2012)
- Significant role of student-faculty interactions in creating inclusive environments for international students and as a major source of academic and social support (Garcia et al., 2018; Glass & Westmont, 2014; Glass et al, 2015).
- International students make strong efforts to interact with faculty regarding coursework and transfer requirements (Dodge, 2015).

Environmental/Campus Ethos Domain

- Support for Learners

- Studies emphasize the importance of institutional support in cultivating a sense of belonging among international students (Behroozi-Bagherpour, 2010; Lau et al., 2019).
  - Academic advising and faculty support are two of the most significant predictors of sense of belonging and educational attainment of international students (Garcia et al., 2018, Mamiseishvili, 2012)
  - Language difficulties, acculturative stress, and lack of social support are a few of the challenges that justify the need for increased attention for more tailored support for international students (Ng, 2006)
-

**Table A6***Comparison of CCSSE Benchmarks with Analysis Results*

<i>CCSSE Benchmark</i>	<i>Scalek for International Students</i>
<b>Academic Challenge</b>	
Frequency of working harder than expected to meet teachers' expectations	Academic Challenge
Amount of course emphasis on analyzing basic elements of a theory	Academic Challenge
Amount of course emphasis on synthesizing new ideas or organizing ideas from various information sources	Academic Challenge
Amount of course emphasis on making judgements about the value of soundness of information, arguments of methods	Academic Challenge
Amount of course emphasis on applying theories and concepts to practical problems	Academic Challenge
Amount of course emphasis on using information learned to perform a new skill	Academic Challenge
Number of assigned textbooks, manuals, books, or book-length packs of course readings	Student effort
Number of written papers of reports	
Rate the extent to which your examinations have challenged you to do your best work	Did not load onto any factor
Amount of emphasis by college to encourage you to spend significant amounts of time studying	Student-faculty interaction
<b>Active and Collaborative Learning</b>	
Frequency of asking questions of contributing to class discussions	Academic Challenge
Frequency of making class presentations	Active and Collaborative Learning
Frequency of working with other students on projects during class	Active and Collaborative Learning
Frequency of working with other classmates outside of class to prepare class assignments	Active and Collaborative Learning
Frequency of tutoring other students (paid or voluntary)	Active and Collaborative Learning
Frequency of participating in a community-based project as part of a regular course	Active and Collaborative Learning
Frequency of discussing ideas from readings with others outside of class	Did not load onto any factor
<b>Student Effort</b>	
Frequency of preparing two or more drafts of a paper or assignment before turning it in	Student Effort
	Did not load onto any factor

Frequency of working on a paper that required integrating ideas or information from various sources	Did not load onto any factor
Frequency of coming to class without completing readings or assignments	Student effort
Number of books read on your own not assigned	Did not load onto any factor
Hours spent a week preparing for class	Support for learners
Frequency of use: Peer or other tutoring	Support for learners
Frequency of use: Skills lab	Support for learners
Frequency of use: Computer lab	
<b>Student-Faculty Interaction</b>	
Frequency of using e-mail to communicate with an instructor	Academic Challenge
Frequency of discussing grades of assignments with an instructor	Active and Collaborative Learning
Frequency of talking about career plans with an instructor or advisor	Active and Collaborative Learning
Frequency of discussing ideas from your readings or classes with instructors outside of class	Active and Collaborative Learning
Frequency of receiving prompt feedback from instructors on your performance	Academic Challenge
Frequency of working with instructors on activities other than coursework	Active and Collaborative Learning
<b>Support for Learners</b>	
Amount of emphasis by college in providing the support to help students succeed at college	Student-faculty Interaction
Amount of emphasis by college to encourage contact among diverse students	Student-faculty Interaction
Amount of emphasis by college to help students cope with non-academic responsibilities	Student-faculty Interaction
Amount of emphasis by college to provide financial support	Student-faculty Interaction
Frequency of use of academic advising/planning	Support for learners
Frequency of use of career counseling	Support for learners

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**Table A7**

*Comparison of Reliability Statistics between Original CCSSE Benchmarks & Newly Constructed Scales*

<b>Benchmark</b>	<b>Cronbach Alpha of Original Benchmark</b>	<b>Cronbach Alpha of Newly Constructed Scale</b>
Academic Challenge (Cognitive Learning)	0.77	0.81
Active & Collaborative Learning (Collaborative Learning)	0.62	0.75
Student-Faculty Interaction (Environmental Support)	0.73	0.81
Support for Learners (Academic Support)	0.78	0.72
Student Effort (Academic Tasks)	0.56	0.58

**Table A8***Reconceptualized CCSSE Scales for International Students*

<i>Scale</i>	<i>Cronbach's Alpha (<math>\alpha</math>)</i>
<p><b>Cognitive Learning</b></p> <p>Amount of emphasis in coursework on analyzing the basic elements of an idea, experience of theory (ANALYZE)</p> <p>Amount of course emphasis on synthesizing new ideas, and organizing information in new ways (SYNTHESZ)</p> <p>Amount of course emphasis on making judgments about the value of soundness of information, arguments, or methods (EVALUATE)</p> <p>Amount of course emphasis on applying theories or concepts to practical problems or in new situations (APPLYING)</p> <p>Amount of course emphasis on using information to perform a new skill (PERFORM)</p> <p>Frequency of receiving prompt feedback from instructors (FACFEED)</p> <p>Frequency of working harder than expected to meet instructors' standards (WORKHARD)</p> <p>Frequency of asking questions in class or contributing to class discussions (CLQUEST)</p>	0.81
<p><b>Collaborative Learning</b></p> <p>Frequency of discussing ideas from readings or classes with instructors outside of class (FACIDEAS)</p> <p>Frequency of working with instructors on activities other than coursework (FACOTH)</p> <p>Frequency of working with classmates outside of class to prepare class assignments (OCCGRP)</p> <p>Frequency of participating in a community-based project as part of a regular course (COMMPROJ)</p> <p>Frequency of tutoring other students (TUTOR)</p> <p>Frequency of working with other students on projects during class (CLASSGRP)</p> <p>Frequency of making class presentations (CLPRESEN)</p> <p>Frequency of discussing grades of assignments with an instructor (FACGRADE)</p>	0.75



<b>Student-faculty Interaction (Environmental Support)</b>	0.81
College emphasis on providing support for students to thrive socially (ENVSOCAL)	
College emphasis on helping students cope with non-academic responsibilities (ENVNACAD)	
College emphasis on encouraging contact among diverse students (ENVDIVRS)	
College emphasis on providing student support to help them succeed at college (ENVSUPRT)	
College emphasis on encouraging students to spend significant amounts of time studying (ENVSCHOL)	
<b>Academic Support</b>	0.68
Frequency of use of academic advising/planning (USEACAD)	
Frequency of use of career counseling (USECACOU)	
Frequency of use of skills lab (USELAB)	
Frequency of use of computer lab (USECOMLB)	
<b>Academic Tasks</b>	0.58
Number of written papers or reports of any length (WRITEANY)	
Number of assigned textbooks, manuals, books, or course readings (READASGN)	
Number of books read on your own for personal enjoyment or academic enrichment (READOWN)	
Number of hours spent preparing for class (ACADPR01)	
Frequency of preparing two or more drafts of a paper or assignment before turning it in (REWROPAP)	

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**Table A9***Descriptive Statistics for Newly Constructed Scales*

<b>Descriptive Statistics</b>				
	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Student Effort	0.00	0.86	0.4452	0.12511
Academic Challenge	0.00	0.82	0.4984	0.14312
Active & Collaborative Learning	0.00	0.75	0.2741	0.13172
Environmental Support	0.00	0.75	0.4351	0.17600
Support for Learners	0.00	1.00	0.5726	0.20737

**Sample Size = 4109**

**Table A10***Factors Predicting GPA for International Students**Logistic Regression Odds Ratio*

<b>Model</b>	<b>b</b>	<b>SE-b</b>	<b>Wald</b>	<b>Df</b>	<b>Exp(B)</b>	<b>95% CI for Odds Ratio</b>
<b>A to B</b>						
Gender (Female)	-0.055	0.136	0.165	1	0.946	0.725-1.235
Age: <20	-1.101	0.631	3.041	1	0.333	0.096-1.146
20-29	-0.758	0.623	1.478	1	0.469	0.138-1.590
30-39	0.358	0.691	0.269	1	1.431	0.369-5.542
40-50	0.441	0.799	0.305	1	1.554	0.325-7.440
Marriage (single)	0.527	0.239	4.867	1	1.695	1.061-2.707
Children (none)	-0.678	0.173	15.378	1	0.508	0.362-0.713
Enrollment (full-time)	-0.300	0.155	3.761	1	0.740	0.547-1.003
ESL (required)	0.138	0.140	0.962	1	1.148	0.871-1.511
Financial Support-Grants	0.062	0.156	0.156	1	1.064	0.783-1.445
Financial Support-Own Income	0.041	0.154	0.070	1	1.042	0.770-1.410
Financial Support-Parents Income*	0.463	0.157	8.738	1	1.588*	1.169-2.159
Academic Tasks*	1.973	0.634	9.675	1	7.190*	2.074-24.923
Cognitive Learning*	2.128	0.640	11.074	1	8.399*	2.398-29.415
Collaborative Learning	0.255	0.692	0.135	1	2.636	0.332-5.011
Environmental Support*	0.969	0.450	4.633	1	2.636*	1.091-6.372
Academic Support	0.002	0.376	0.000	1	1.002	0.480-2.085

\*\*\*p<=.000, \*\*p<=.01, \*p<=.05

Reference group is C or lower

*Logistic Regression Odds Ratio*

<b>Model</b>	<b>b</b>	<b>SE-b</b>	<b>Wald</b>	<b>Df</b>	<b>Exp(B)</b>	<b>95% CI for Odds Ratio</b>
<b>B- to C+</b>						
Gender (Female)	0.108	0.154	0.490	1	1.114	0.114-1.712
Age: <20	-0.818	0.691	1.399	1	0.441	0.114-1.712
20-29	-0.632	0.682	0.858	1	0.531	0.140-2.024
30-39	-0.114	0.758	0.023	1	0.892	0.202-3.944
40-50	-0.185	0.886	0.043	1	0.832	0.146-4.720
Marriage (single)	-0.036	0.274	0.017	1	0.965	0.564-1.651
Children (none)	-0.295	0.195	2.280	1	0.745	0.508-1.092
Enrollment (full-time)	-0.103	0.173	0.351	1	0.902	0.642-1.268
ESL (required)	0.266	0.159	2.810	1	1.305	0.956-1.781
Financial Support-Grants	-0.048	0.176	0.075	1	0.953	0.674-1.347
Financial Support-Own Income	-0.070	0.175	0.160	1	0.932	0.662-1.314
Financial Support-Parents Income	0.036	0.178	0.040	1	1.036	0.731-1.468
Academic Tasks	0.882	0.717	1.513	1	2.415	0.593-9.842
Cognitive Learning	0.323	0.724	0.199	1	1.382	0.334-5.715
Collaborative Learning	0.063	0.782	0.006	1	1.065	0.230-4.930
<b>Environmental Support*</b>	<b>1.493</b>	<b>0.509</b>	<b>8.608</b>	<b>1</b>	<b>4.448</b>	<b>0.629-3.332</b>
Academic Support	0.370	0.425	0.755	1	0.745	0.508-1.092

\*\*\*p<=.000, \*\*p<=.01, \*p<=.05

**Sample Size = 4036**  
**Nagelkerke R Square = 0.083**

**Table A11***Factors Predicting International Students' Sense of Belonging Among Peers*

<b>Variable</b>	<b>B</b>	<b>Std Error</b>	<b>p</b>	<b>95.0% CI for B</b>
Gender	-0.010	0.006	0.096	(-0.022, -0.002)
Children	0.011	0.008	0.176	(-0.005, 0.027)
Marriage	-0.016	0.009	0.082	(-0.034, 0.002)
Enrollment	-0.001	0.007	0.932	(-0.015, 0.014)
Age: <20	0.007	0.045	0.875	(-0.082, 0.096)
20-29	0.006	0.045	0.900	(-0.083, 0.094)
30-39	0.020	0.046	0.030	(-0.071, 0.110)
40-50	0.028	0.048	0.554	(-0.065, 0.122)
>50	0.023	0.050	0.654	(-0.076, 0.122)
Financial Support: Grants	0.008	0.007	0.269	(-0.006, 0.021)
Financial Support: Own Income	-0.004	0.007	0.563	(-0.017, 0.009)
Financial Support: Parents' Income	0.000	0.007	0.768	(-0.014, 0.010)
ESL Requirement	-0.022**	0.006	0.000	(-0.035, -0.010)
Academic Tasks	0.012	0.027	0.646	(-0.040, 0.065)
Cognitive Learning	0.079**	0.028	0.004	(0.025, 0.133)
Collaborative Learning	0.164**	0.029	0.000	(0.107, 0.220)
Environmental Support	0.282**	0.020	0.000	(0.244, 0.321)
Academic Support	0.067**	0.016	0.000	(0.035, 0.099)

\*\*\*p<=.000, \*\*p<=.01, \*p<=.05

**Sample Size = 4049**  
**Adjusted R Square = 0.133**

**Table A12***Factors Predicting International Students' Sense of Belonging Among Faculty*

<b>Variable</b>	<b>B</b>	<b>Std. Error</b>	<b>p</b>	<b>95.0% CI for B</b>
Gender	-0.006	0.005	0.277	(-0.016, 0.004)
Children	0.009	0.007	0.215	(-0.005, 0.022)
Marriage	-0.007	0.008	0.371	(-0.022, 0.008)
Enrollment	-0.010	0.006	0.091	(-0.022, 0.002)
Age: <20	-0.045	0.039	0.241	(-0.121, 0.030)
20-29	-0.039	0.038	0.308	(-0.114, 0.036)
30-39	-0.010	0.039	0.790	(-0.087, 0.066)
40-50	0.013	0.041	0.755	(-0.067, 0.092)
>50	-0.019	0.043	0.662	(-0.103, 0.065)
Financial Support: Grants	0.006	0.006	0.299	(-0.005, 0.018)
Financial Support: Own Income	0.000	0.006	0.933	(-0.011, 0.011)
Financial Support: Parents Income	-0.013*	0.006	0.028	(-0.024, -0.001)
ESL Requirement	-0.007*	0.005	0.191	(-0.017, 0.003)
Academic Tasks	0.004	0.023	0.849	(-0.040, 0.049)
Cognitive Learning	0.167**	0.023	0.000	0.121, 0.213)
Collaborative Learning	-0.058*	0.024	0.017	(-0.106, -0.010)
Environmental Support	0.336**	0.017	0.000	(0.303, 0.368)
Academic Support	0.036*	0.014	0.010	0.009, 0.063)

\*\*\*p&lt;=.000, \*\*p&lt;=.01, \*p&lt;=.05

**Sample Size = 4042**  
**Adjusted R Square = 0.164**

**Table A13***Factors Predicting International Students' Sense of Belonging Among Administrative Personnel*

<b>Variable</b>	<b>B</b>	<b>Std. Error</b>	<b>p</b>	<b>95.0% CI for B</b>
Gender	-0.028**	0.007	0.000	(-0.041, -0.015)
Children	0.022	0.009	0.012	(0.005, 0.040)
Marriage	-0.025	0.010	0.012	(-0.045, -0.006)
Enrollment	0.005	0.008	0.546	(-0.011, 0.020)
Age: <20	-0.016	0.049	0.751	(-0.112, 0.081)
20-29	-0.016	0.049	0.744	(-0.112, 0.080)
30-39	0.002	0.050	0.964	(-0.096, 0.100)
40-50	0.025	0.052	0.628	(-0.077, 0.127)
>50	-0.019	0.055	0.729	(-0.126, 0.088)
Financial Support: Grants	-0.001	0.008	0.917	(-0.016, 0.014)
Financial Support: Own Income	0.011	0.007	0.141	(-0.004, 0.025)
Financial Support: Parents Income	-0.005	0.007	0.518	(-0.019, 0.010)
ESL Requirement	-0.010	0.007	0.121	(-0.023, 0.003)
Academic Tasks	0.058*	0.029	0.046	(0.001, 0.115)
Cognitive Learning	-0.007	0.030	0.826	(-0.066, 0.052)
Collaborative Learning	-0.048	0.031	0.122	(-0.110, 0.013)
Environmental Support	0.482	0.021	0.000	(0.441, 0.524)
Academic Support	0.127	0.018	0.000	(0.092, 0.162)

\*\*\*p&lt;=.000, \*\*p&lt;=.01, \*p&lt;=.05

**Sample Size = 4050**  
**Adjusted R Square = 0.187**





**Appendix B**

**Figures**

Figure B1. The International Student Engagement Model (ISE) depicting factors influencing the GPA and sense of belonging of international students in U.S. community colleges.

*Inputs*

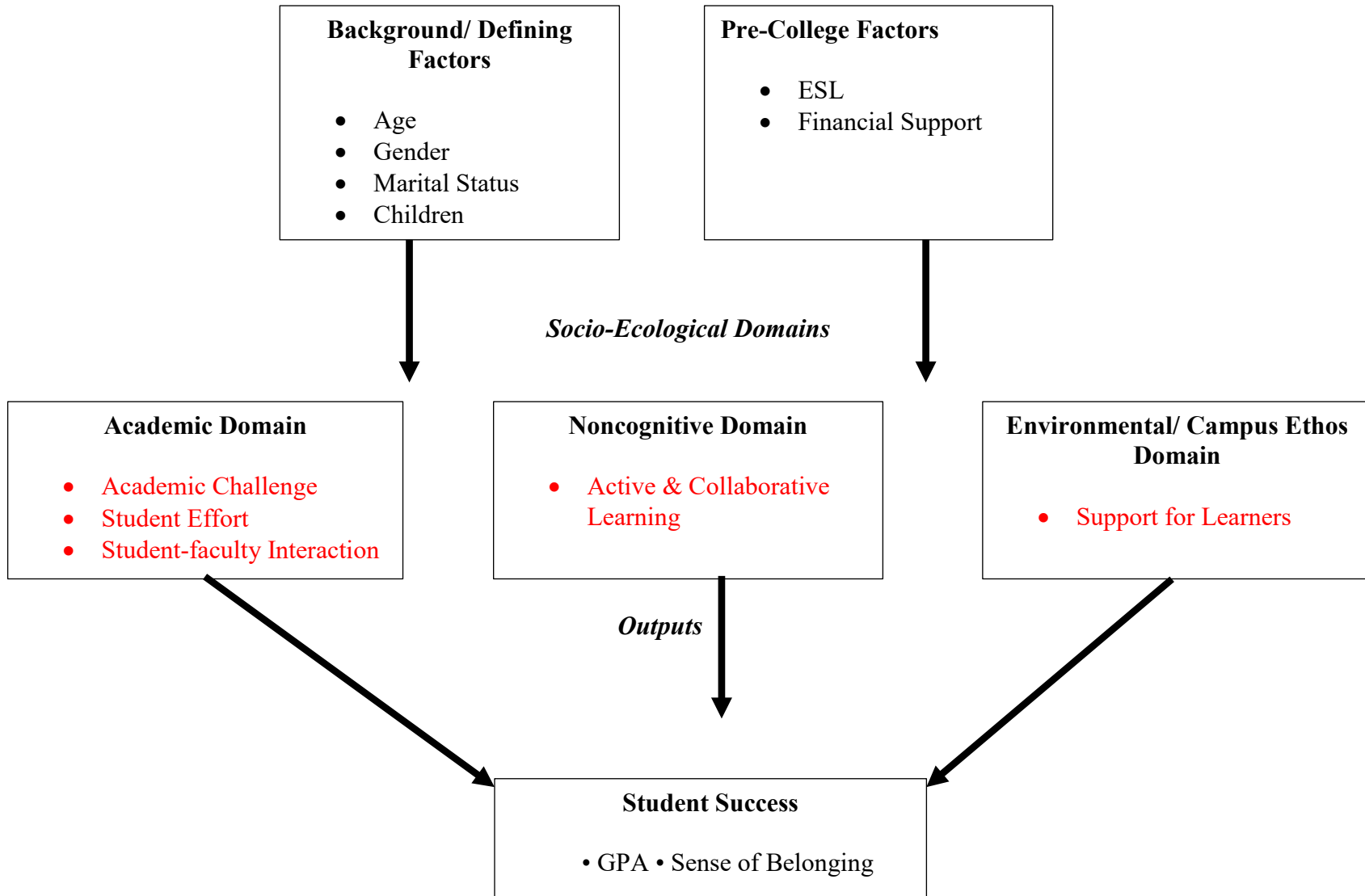


Figure B2. The International Student Engagement Model (ISE) depicting factors influencing the GPA and sense of belonging of international students in U.S. community colleges using reestablished CCSSE benchmarks

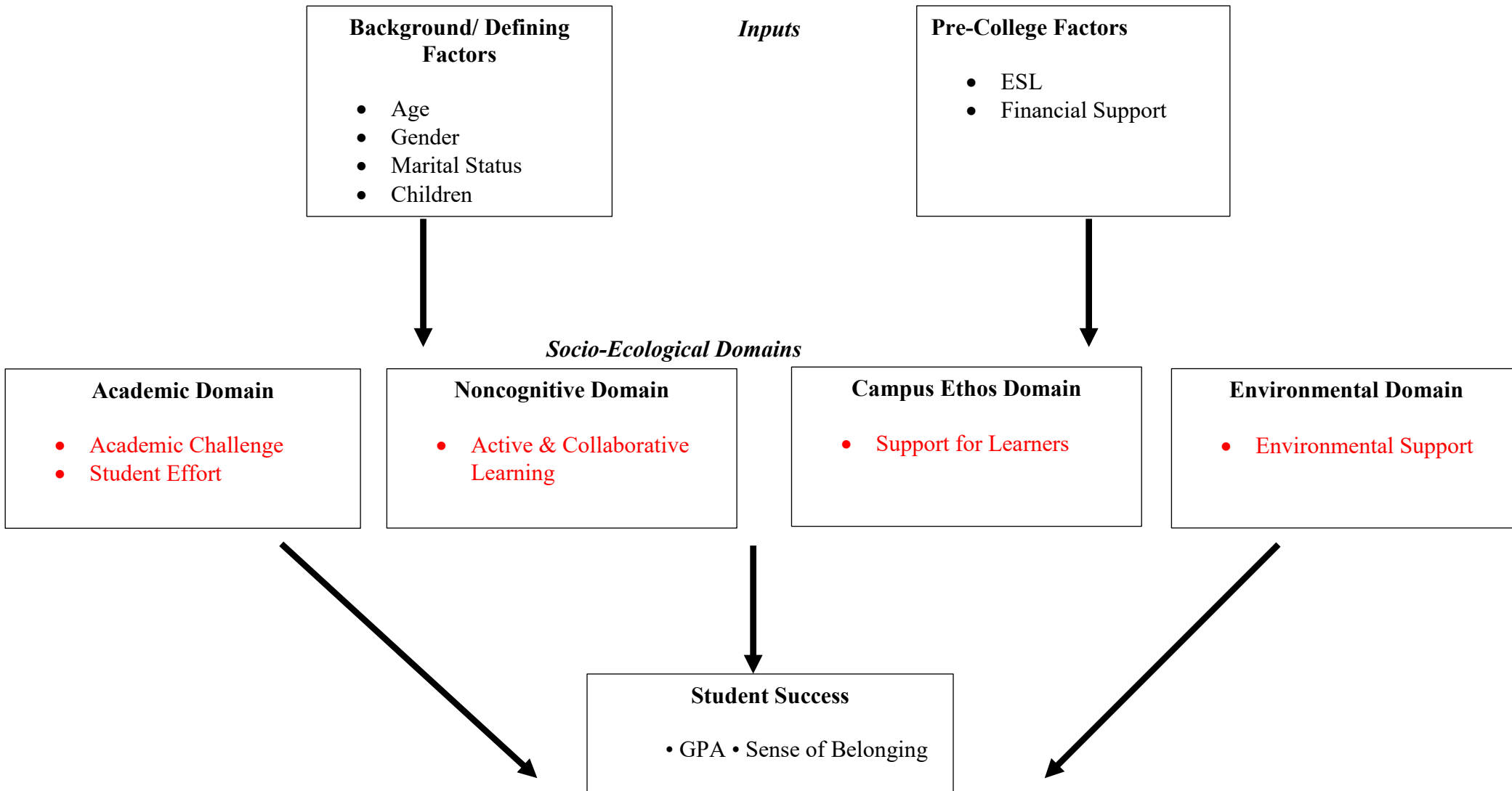
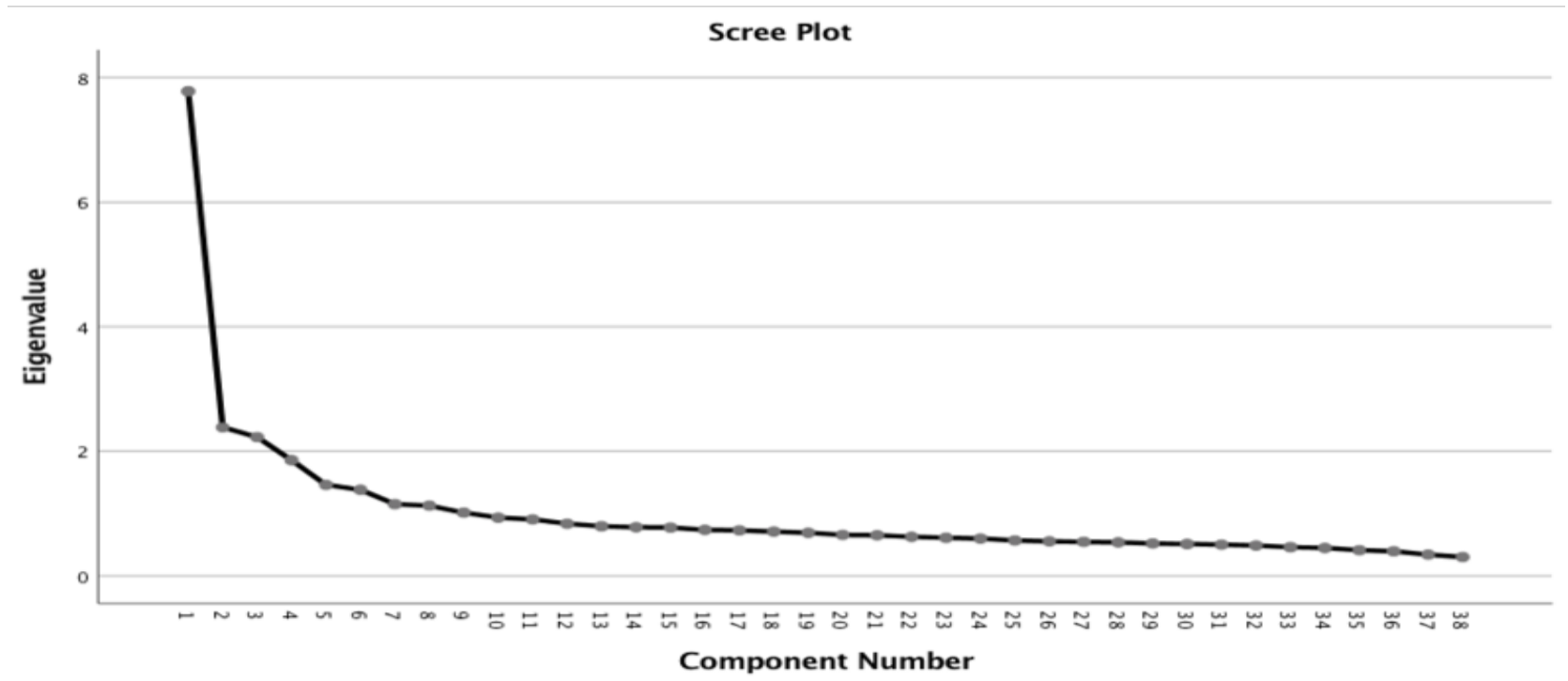


Figure B3. Scree Plot of Number of Components and Eigenvalues



## **Appendix C**

### **IRB**

APPROVAL OF SUBMISSION

February 27, 2019

Dina Alghazzawi

dalghazzawi@uh.edu

Dear Dina Alghazzawi:

On February 27, 2019, the IRB reviewed the following submission:

Type of Review:	Modification and Continuing Review
Title of Study:	The Road to the Baccalaureate: Assessing the Viability of Community Colleges as Transfer Pathways for International Students
Investigator:	Dina Alghazzawi
IRB ID:	MODCR00000404
Funding/ Proposed Funding:	Name: Unfunded; Name: Unfunded
Award ID:	None
Award Title:	
IND, IDE, or HDE:	None
Documents Reviewed:	<ul style="list-style-type: none"> <li>• Dina Ghazzawi, Category: IRB Protocol;</li> <li>• Data Use Agreement Form, Category: Other;</li> </ul>
Review Category:	Exempt
Committee Name:	Not Applicable
IRB Coordinator:	<a href="#">Sandra Arntz</a>

The IRB granted continuing approval for this study from February 27, 2019 forward.

Please note – the current IRB review of this protocol is compliant under the new Common Rule.

- Under the new regulations and due to the minimal risk nature of the study, annual continuing reviews for this study have been discontinued.

**IMPORTANT:** Although there is no ongoing requirement for continuing review, submissions to the IRB are still required for modifications to the study protocol, reportable new information, and study closure.

U N I V E R S I T Y of  
**HOUSTON**

DIVISION OF RESEARCH  
Institutional Review Boards

Unless a waiver has been granted by the IRB, use the stamped consent form approved by the IRB to document consent. The approved version may be downloaded from the documents tab.

Summary of approved modification(s):

The study conducted will be regarding the same topic (international students at community colleges), however I will be using data from the Community College Survey of Student Engagement from which I have obtained prior approval via a data use agreement form. The data is publicly accessible.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system.

Sincerely,

Research Integrity and Oversight (RIO) Office  
University of Houston, Division of Research  
713 743 9204  
cphs@central.uh.edu  
<http://www.uh.edu/research/compliance/irb-cphs/>