Spring 2020

# Neglected Cultural Outcomes That Impact Hispanic-Serving Institution Policymaking

Amanda Kate Burbage
*Old Dominion University*, akburbage@gmail.com

# NEGLECTED CULTURAL OUTCOMES THAT IMPACT HISPANIC-SERVING INSTITUTION POLICYMAKING

by

Amanda Kate Burbage
B.A. May 2002, Old Dominion University
M.A December 2007, Old Dominion University

A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY

HIGHER EDUCATION

OLD DOMINION UNIVERSITY
May 2020

Approved by:

Dr. Christopher Glass (Director)

Dr. David Ayers (Member)

Dr. Cherng-Jyh Yen (Member)

## ABSTRACT

### NEGLECTED CULTURAL OUTCOMES THAT IMPACT HISPANIC-SERVING INSTITUTION POLICYMAKING

Amanda Kate Burbage
Old Dominion University, 2020
Director: Dr. Christopher Glass

The Higher Education Act (HEA) Title V is designed to expand opportunities, increase attainment, and enhance institutional quality and stability of Hispanic-Serving Institutions (HSIs). The assessment of Title V goals relies on enrollment, retention, and graduation rates which reflect organizational outcomes that policymakers prioritized without deference to student population, institutional mission, and funding levels. Title V policymakers do not currently consider the ways HSIs centralize the racialized experiences of students and institutions do not uniformly collect or report cultural outcome data despite its relevancy to Hispanic student success.

The purpose of this study was to draw on criteria identified in the qualitative literature to quantitatively investigate the Typology of HSI Organizational Identities (Garcia, 2017) as a policymaking tool. A TwoStep cluster analysis was used to determine how well the measured variables represent the conceptual typology constructs. A MANOVA determined the degree cultural outcomes further differentiated HSI clusters. To determine the extent to which institutions centralized the experiences of Hispanic students, a website review was used.

The results showed three distinct four-year sub-clusters and three distinct two-year sub-clusters with good silhouette measure of cohesion and separation scores. A statistically significant MANOVA in both sets of sub-clusters revealed, to small effect, that 17% of variance

in cultural outcomes was explained by cluster assignment. Differences between clusters were detected in five of 15 cultural variables.

The findings of this study align with the Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017); however, alignments could only be made after rubric-informed website reviews. The typology was limited in its practical use because it currently does not accommodate important sector differences. There is overwhelming evidence that two-year and four-year HSIs are significantly different from one another, thus may benefit from separate treatment in Title V. Current federal data prioritization and collection practices are insufficient to affirm an institution's ability to serve Hispanic students, and opportunities exist for policymakers to remedy the neglect of cultural outcomes. Although interpretation of the findings is constrained by methodological limitations, the results may be used by policymakers, scholars, and HSI practitioners to tailor efforts designed to truly serve Hispanic students.

*Keywords:* Hispanic-Serving Institution, organizational outcomes, cultural outcomes, TwoStep cluster analysis, MANOVA, policymaking

I dedicate this project to my teachers:

Primary and secondary teachers who laid strong foundations.

Post-secondary teachers who set high expectations and inspired curiosity.

Those teachers in my communities of faith and work.

My earliest and most influential teachers, my family.

I have learned so much from you.

## ACKNOWLEDGEMENTS

I am grateful for the opportunity to formalize my acknowledgements to all of the people who encouraged, supported, influenced, and challenged me on this Ph.D. journey. My hope is that when you read this, you will not be surprised, as I have tried to express my appreciation at every turn.

I give all glory to God. I could not have imagined the purpose He has for my life, and I could not have faced this project without the confidence that the victory was already His.

Thank you, Dr. Glass, for encouraging me to take a summer course. It reignited a love for learning, and ultimately led me to pursue this degree. You have carefully and thoughtfully guided me any time I needed assistance. As a committee chair, you have humbled me, built me up, and challenged me to say something meaningful. Dr. Ayers and Dr. Yen, without my time in your courses, I would not have been as ready to undertake this project. Your instruction and insight have been invaluable along the way. Dr. Williams, your guidance and care during Proseminar was essential.

I'd like to acknowledge the work of tireless HSI scholars. You bring the voice of students and leaders to the forefront. You highlight the good and the opportunities to do better. Your critical scholarship inspired me. Thank you for raising so many questions.

CCL Cohort 15, you have kept me on track, answered my late-night questions, engaged in thought experiments, helped me take perspective, awed me with your talents, and tolerated my control of the television at Summer Institute during the Women's College Softball World Series. This cohort is a treasure, worth more than the weight of all our books and papers in gold. I pray I am as helpful to you as you have been to me. HIED, you took me in and welcomed me with open arms, and for that, I am thankful.

To my friends from so many corners of my life, the ones who have checked in on me even when I couldn't return the favor, and the ones who were ready to take on any fight I might, our relationships mean the world to me. To the small few who sat with me in the back yard as we listened to 70s soul funk and 90s alternative or invited me over for dinners and friend-dates those moments are sealed in my heart. It was always just what I needed when I needed it. To my coworkers, you made space for me to go through the ups and downs of this journey, and that's more meaningful than you might know.

To my family who cheered me on, helped with laundry, let me read in the corner at family gatherings, played chauffeur, listened while I talked about nerdy things, and 1,000 other tasks - there aren't enough thank you's in the world. I know you are proud of me, and that reward is greater than the diploma. To my children, Allie, and Sam, you have made many sacrifices so that I could achieve my goals. Your independence, impromptu hugs, willingness to go with the flow, and overall generous attitude towards me and all my shortcomings has been a gift.

Finally, I would not miss the opportunity to thank my partner in all things, my husband, my best friend, Joe Moses. From the very first class to the very last sentence in this paper, you've earned this degree in many respects. Your admiration, encouragement, and flexibility have kept the trains on the tracks. This song goes out to you: We've walked 47 miles of barbed wire, now tell me… who do you love?!

# TABLE OF CONTENTS

Page

# LIST OF TABLES

# LIST OF FIGURES

# CHAPTER I

## INTRODUCTION

The Higher Education Act (HEA) Title V defines a Hispanic-Serving Institution (HSI) as an eligible higher education organization that "has an enrollment of undergraduate full-time equivalent students that is at least 25 percent Hispanic students" (U.S. Department of Education, 2018, p. 1). The purpose of the Higher Education Act (HEA) Title V is to expand opportunities, increase attainment, and enhance institutional quality and stability (Higher Education Act, 20 U.S.C., §§ 1101-1103). Enrollment is the key criteria for Title V HSI designation; however, enrollment alone does little to ensure the HEA Title V goals of increasing attainment and enhancing quality are achieved (Lascher, 2018; Shapiro et al., 2016).

Current Title V federal policy privileges measures of enrollment and attainment at HSIs universally, without regard to differences in institutional capacity to holistically serve Hispanic[1] students. Further, there is little understanding about the diversity within HSIs and no tangible way for policymakers to conceptualize an effective HSI beyond the use of normative measures. The policy is silent on cultural factors that positively impact Hispanic student enrollment and attainment (Garcia, 2019; Lascher, 2018).

Scholars have attempted to distinguish the difference between *Hispanic-Enrolling* (HEI) and *Hispanic-Serving* institutions to consider how Hispanic students benefit from attendance, attainment, and cultural enrichment at HSIs (Calderón Galdeano, Flores, & Moder, 2012; Garcia, 2016a; Garcia & Okhidoi, 2015; D. A. Santiago, 2012; Santiago, Taylor, & Galdeano, 2016).

---

[1] The term "Hispanic" is used within the federal context and refers to people who have historic, social, and geographic roots in Mexico, Central and South America, and the Caribbean. The terms "Latino" and "Latinx" are used in research contexts prioritizing the preferred terminology expressed by the original author(s).

Furthermore, HSI experts have appealed to policymakers to consider funding allocations in nuanced manners (Garcia, 2017; Nuñez, Crisp, & Elizondo, 2016; D. A. Santiago, 2012).

Enrollment, retention, and graduation rates have been suggested as effective measures of Latino student service (Crisp, Nora, & Taggart, 2009; Flores & Park, 2013). Measures such as these are organizational outcomes, prioritized without deference to stratified systems of education which serve different populations of students, for a variety of purposes, with unequitable levels of funding (Garcia 2019; Hurd 2008). However, comparing HEI performance to Predominantly White Institutional (PWI) performance using normative organizational outcomes without cultural context leads to a misguided conclusion that HSIs are substandard (Garcia, 2019). HSIs serve students in multiple ways, such as enhancing non-cognitive outcomes, sense of belonging, and cultural connections on campus (Dayton & Rogoff, 2013; Guardia & Evans, 2008; Sebanc, Hernandez, & Alvarado, 2009). In essence, these types of cultural outcomes centralize the racialized experiences and special cultural knowledge of Latinx students (Garcia, 2019). Ultimately the problem of conceptualizing HSIs based only on HEI standards "undermines the public policy intent and spirit of the HSI designation" (D. A. Santiago, 2012, p. 165).

Investigations into *serving* versus *enrolling* have been crucial to the contribution of understanding HSI identity and performance (Garcia, 2013a, 2016a; D. A. Santiago, 2012; Santiago et al., 2016). Likewise, qualitative studies in this vein of inquiry have highlighted the voices of faculty and administrators that perform the daily work of serving students, as well as the voices of students themselves (Arbelo-Marrero & Milacci, 2016; Gooden & Martin, 2014; Martinez, 2015; Medina & Posadas, 2012). The rich findings from studies, which explore the difference between HEIs and HSIs, may be affirmative and informative to practitioners.

However, qualitative studies have limited value for policymaking because empirical categories are necessary to craft policy which meets the range and depth of institutional needs across the country (Locke, 2009; Meyer & Rosinger, 2019).

**Purpose Statement**

The purpose of this study was to draw on criteria identified in the qualitative literature to quantitatively investigate, for policymaking purposes, the theoretical typology that examines organizational outcomes and cultural outcomes together to understand how HSIs truly serve Latino students. Using Garcia's (2017) Typology of HSI Organizational Identities as a framework for investigation, this study used TwoStep cluster analysis and Multivariate Analysis of Variance (MANOVA) to identify the homogenous groups that exist within the heterogeneous HSI population when organizational and cultural outcomes identified in the qualitative research are quantified and clustered.

**Background of the Study**

Latinos in the United States have faced historical social struggles, including gaining recognition and equity in federal higher education policy. In 1992, the designation *Hispanic-Serving Institution* entered the higher education lexicon resulting from two decades of effort by the Hispanic Higher Education Coalition, Hispanic Association of Colleges and Universities (HACU), and others (Valdez, 2015). Upon initial inclusion in the Higher Education Act, Title III provided HSIs federal funding. In 1998, the Higher Education Act was amended to provide additional funding through Title V (Mercer, 2008). Although more than $1.6 billion have been awarded under Title V since its establishment (U.S. Department of Education, 2009b, 2017), it is difficult for policy analysts to assess the direct impact the funding has made toward its intended targets of opportunity, attainment, and quality because data are opaque or uncollected.

Hispanic student participation has increased steadily at postsecondary institutions, with a boost in participation trends since 2005. Over the previous decade, total college enrollment rates for Hispanic 18- to 24-year-olds increased by 14%, from 25% to 39%, while gains in other racial and ethnic groups were only moderate, ranging from 3% to 4% (National Center for Education Statistics, 2017). The share of Latino adults aged 25-34 with an associate degree or higher has increased by 9% from 2007 to 2017. Problematically, this only represents 28% of the totally Latino population, and lags other racialized groups in completion proportions, with 35% of Black and 55% of White populations having completed an associate degree or higher (Miller, 2018). In short, since the policy prioritized Hispanic enrollment and attainment, organizational outcomes have been improving, but measures still lag comparison groups.

Concerningly, HSIs remain less funded than other institutions. According to Hispanic Association of Colleges and Universities (2019), HSIs received $3,117 per student from all federal revenue sources, while the average for all degree-granting institutions was $4,605. Less funding per student has resulted in decreased spending in instruction, services, and other academic support (Merisotis & McCarthy, 2005). HSIs, like other minority institutions, support disproportionately disadvantaged student populations with fewer resources (Gasman, Samayoa, & Nettles, 2017). Institutional spending has been linked with attainment (Garcia, 2013b; Webber, 2017), but the relationship between the organizational outcome of spending has not been linked with cultural outcomes which are known to have positive impacts on Latino student college experiences (Cerezo & Chang, 2013; Cuellar, 2014).

It is evident by the critical mass of Latino students enrolled that HSIs stand to make an impact on Hispanic-student enrollment and attainment, addressing issues of historical exclusion and access (Hagedorn, Chi, & Cepeda, 2007). Moreover, the opportunity for impact will

increase over time given the substantial increases in the numbers of designated institutions, those approaching designation, and Latino student enrollment (Excelencia in Education, 2019; National Center for Education Statistics, 2017). However, crafting responsive funding policy for this heterogeneous group of postsecondary institutions is difficult without confidently knowing the groupings of institutions. HSIs are two- and four-year institutions, publicly and privately held, secular and religious, and offer unique and competitive programming in search of Title V funds (Hispanic Association of Colleges and Universities, 2018). Yet, HSIs are treated monolithically by the Higher Education Act of 1992 (P.L. 102-325) which only defines HSI by enrollment, and aims to improve attainment, no matter the unique circumstances or challenges of the institution.

**Conceptualizing HSIs**

HSI typologies have been developed to better conceptualize the diversity of institutions within the designation, and as a mechanism by which the Department of Education could prioritize funding (Garcia, 2017; Nuñez et al., 2016). Further, the typologies may serve as guides for scholars investigating segments of HSIs and college leaders in benchmarking practices, both bringing to bear student-focused service.

Garcia (2017) investigated the construction of a Latinx-serving organizational identity. In a single-site case study, interview, focus group, observation, and document analysis data were collected. Participants identified six indicators of an ideal Latinx-serving identity: graduation, graduate school enrollment, employment, community engagement, positive campus climate, and support programs. Applying organizational identity and cultural theory lenses to analyze the data, Garcia (2017) offered a typology along two axes: organizational outcomes and cultural outcomes (see Figure 1). This matrix represents a unique attempt at conjoining two key factors

to create a holistic understanding of HSI organizational identity. The present study explores the usefulness of this typology in a policymaking setting, investigating possible applications were HEA Title V policy can be revised to better align with HSI heterogeneity.

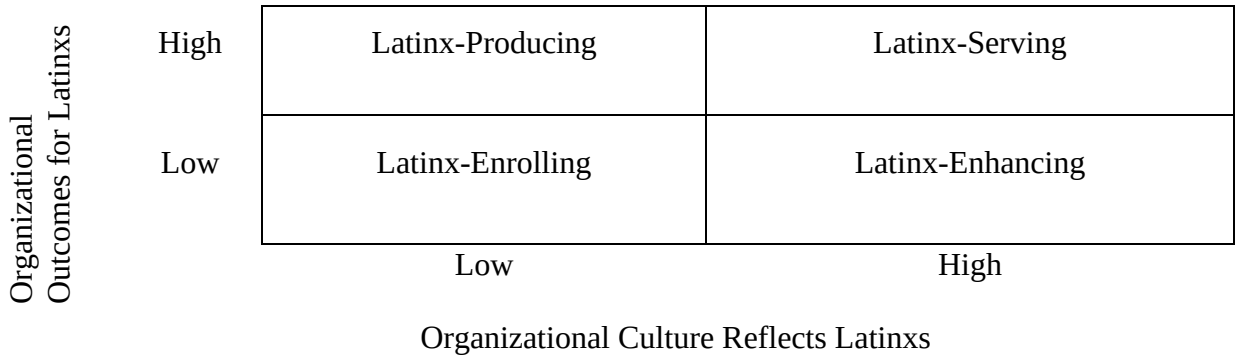


*Figure 1.* Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017).

The current investigation is exploratory and moves the conceptualizing of HSIs, with both organizational and cultural outcomes, into the policymaking space through cluster analysis. The findings provide scholars with a framework from which to investigate within and between group differences among HSIs. Furthermore, this work provides HSI advocates with a quantifiable narrative to use as a basis of persuasion, convincing policymakers to account for aspects relevant to serving Latino students beyond that of enrollment and attainment, and contrary to HEI or PWI norms.

**Research Questions**

1. What homogeneous clusters of Hispanic-Serving Institutions emerge based on organizational and cultural outcome variables?

2. To what extent does cluster assignment differ by cultural outcome variables?
3. How can institutional websites be used as cultural artifacts to further distinguish between clusters?

**Hypothesis**

- $H1_0$: There are no discernable clusters among Hispanic-Serving Institutions based on organizational and cultural outcome variables.
- $H1_a$: There are more than two discernable clusters among Hispanic-Serving Institutions based on organizational outcome variables.
- $H2_0$: There are no differences in cluster assignment among Hispanic-Serving Institution based on cultural outcomes.
- $H2_a$: There are significant differences in cluster assignment among Hispanic-Serving Institution based on cultural outcomes.

**Professional Significance**

This research was aimed at three significant factors. First, the study contributed to the HSI academic literature. Valuable nationwide findings have centralized on identity, social factors (i.e., climate, sense of belonging), and success factors (i.e., engagement) of Latino students at HSIs (Hurtado & Ruiz, 2012; Nuñez, Sparks, & Hernandez, 2011; Santiago et al., 2016). However, researchers rarely sought to understand the evolved differences between the institutions (Nuñez et al., 2016). As such, results may guide future scholarship by providing a taxonomy of institutions to serve as an investigative framework.

Second, this study elucidated the significance of both organizational outcomes and cultural outcomes. This information is important for scholars to use for further investigation, and HSI professionals to use in shaping practices meant to enhance Latino student attainment.

Similarly, federal policymakers now have a firm foundation upon which to base inclusion of factors in HEA revisions which diversify the conceptualization of HSIs beyond enrollment and attainment.

Third, the findings from this study should inform practices at HSIs which have achieved federal designation criteria, and at Emerging HSIs, which are institutions approaching the federal criteria (Santiago & Andrade, 2010). Institutional peers are valuable for practitioners seeking to understand and improve internal strategies. At the time of the study, HSIs had no mechanism for peer comparison which prioritized the Hispanic student experience. Likewise, as institutions approach HSI designation and Title V eligibility, leaders may begin shaping college practices to better align with those factors that make the greatest impact. Cultural change requires intentional effort in addition to the passage of time (Bolman & Deal, 2017; Manning, 2017). Prioritizing an institutional culture of servingness during the Emerging HSI timeframe may give institutions an advantage in competing for funds as institutions reach the Title V threshold.

**Overview of Methodology**

This study relies on a TwoStep cluster analysis of organizational outcomes to distinguish meaningful homogenous categories of Hispanic-Serving Institutions. Furthermore, this study relies on Multivariate Analysis of Variance (MANOVA) procedures to determine if cultural outcomes further distinguish clusters of HSIs.

TwoStep cluster analysis has been used in cases where group membership or numbers of groups is unknown (Caccam & Refran, 2012). The approach uses algorithms in a systematic process to determine the clusters of data based on proximity. TwoStep cluster analysis accounts for known problems with traditional clustering procedures such as missing and mixed-level data (Caccam & Refran, 2012; IBM Corp., n.d.-b). A TwoStep cluster analysis was used to determine

how well the measured variables represent the conceptual constructs and then be analyzed for their predictive value in identifying organic HSI groupings (IBM Corp., n.d.-b; Tan, Steinbach, & Kumar, 2006). Cluster results were scrutinized to determine overlap with the typologies developed by Garcia (2017) and Nuñez et al. (2016).

MANOVA has been used to assess the effects of the independent variable, cluster assignment, on multiple dependent variables, cultural outcomes (Gamst, Meyers, & Guarino, 2008). Using MANOVA allowed a determination of the combined multivariate effect, as well as the effect of each dependent variable. One advantage of the MANOVA is that Type I error may be reduced because the analysis avoids single *F* tests which may inflate the univariate test of significance (Meyers, Gamst, & Guarino, 2016). In this study, MANOVA was used to maximal potential to further determine how quantitative variables can be combined to create a meaningful derived canonical variable (Grice & Iwasaki, 2007).

Finally, a website review of two institutions closest to each cluster centroid was conducted to better distinguish between clusters with respect to Hispanic student prioritization. A rubric was used to standardize analysis of an institution's efforts to centralize the experiences of Hispanic students at Hispanic-Serving Institutions (see Table 3). Constructs of the rubric are as follows: Curricular/Co-Curricular, Student Support, Advising, Professional Development, and Institutional. This approach was required to address research question three as the quantitative cultural outcome data either have been normed at PWIs or were not currently collected by secondary sources.

**Delimitations**

The primary delimitation was the selected study population. The researcher chose to examine HSIs because of the high percentage of Latino students starting and finishing their post-

secondary education at the HSIs (Excelencia in Education, 2019). Emerging HSIs are significant to consider in the grand scheme of Latino student success, but are not included in this study (Santiago & Andrade, 2010).

The present study makes use of pre-existing data from self-report sources. There are multiple methods to measure success at HSIs, including self-efficacy, student-identity, and GPA (Cerezo & Chang, 2013; Musoba & Krichevskiy, 2014; Reynolds & Weigand, 2010). The researcher selected variables for inclusion in this study because of their specific association with HSIs, critical position within performance and accountability narratives, and availability for analysis.

**Chapter Summary**

The Hispanic population is a fast growing and important thread in the fabric of the United States, including the higher education tapestry. Hispanic-Serving Institutions enroll a sizeable portion of Latino students and are in the greatest position to positively impact Hispanic-student attainment. Yet, Title V policies do not fully appreciate the diversity and identity of institutions within this segment. Using TwoStep cluster analysis and MANOVA procedures, this study aimed to identify the groupings of HSIs through organizational outcome data, and the differences among clusters in cultural outcome measures.

This dissertation is organized into five chapters. Chapter One provides background information, a statement of the purpose of this study, the research questions, and overview of the methodology, significance, and delimitations. Chapter Two frames the research within the historical context of HSIs, focusing on the differences between HEIs and HSIs and the effect of organizational and cultural outcomes on student performance at HSIs. Chapter Three provides a detailed explanation of population identification, data collection, and data analysis procedures.

Chapter Four reports the results of analysis. Finally, Chapter Five concludes the study with a discussion of findings, explanation of limitations, and recommendations for future research.

# CHAPTER II

## LITERATURE REVIEW

For this review, Hispanic-Serving Institution (HSI) literature was identified by searching electronic library database, interest group publications, and books. The review of the literature revealed qualitative and quantitative empirical findings relevant to organizational and cultural factors, HSI organizational identity, and federal policy. The review revealed a gap in conceptualizing HSIs on organizational and cultural factors from a nation-wide perspective. This literature review presents information related to the establishment of HSIs and provides context for the study of organizational and cultural factors, which help form clusters of HSIs and serve as a possible basis to prioritize service to Hispanic students. Figure 2. Literature review topic funnel diagram. illustrates the organization of Chapter Two.

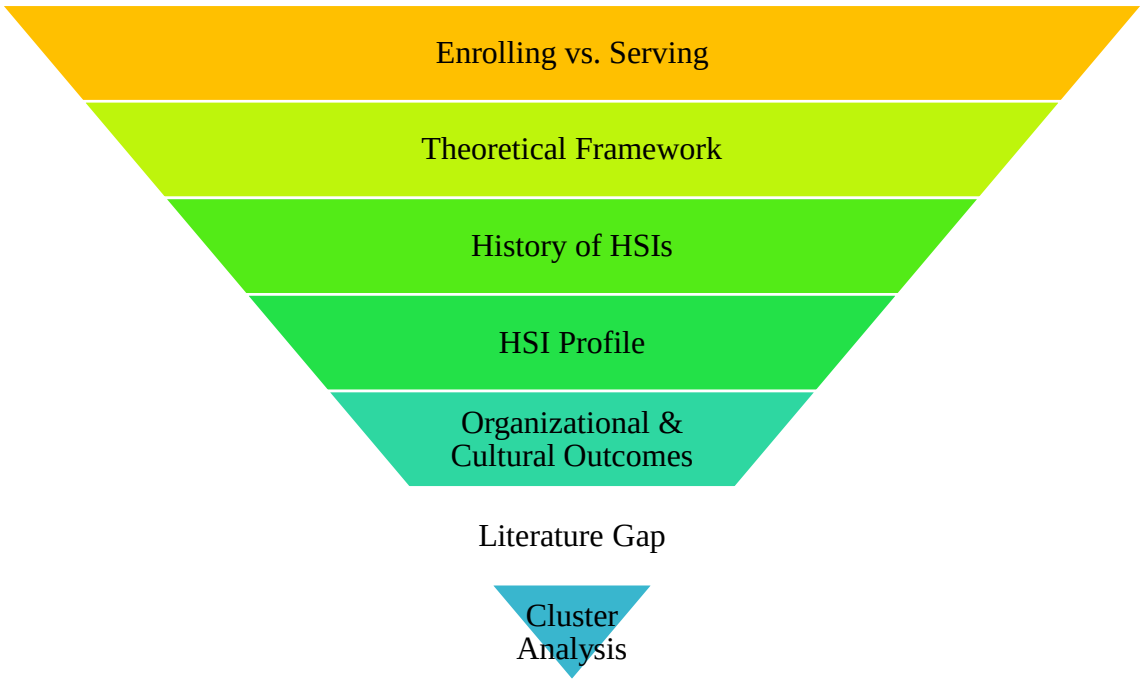


*Figure* 2. Literature review topic funnel diagram.

**Hispanic-Enrolling versus Hispanic-Serving Institutions**

The failure to include cultural outcomes in the criteria to meet the federal Hispanic-Serving Institution designation has resulted in decades of work by scholars and practitioners in parsing out what it means to *serve* Hispanic students. With the enrollment measure as the emphasis of the policy, institutions have made positive gains in increasing access. However, access does not always lead to degree attainment. Although the aim of the Title V policy is to increase attainment for Hispanic students, Title V is not responsive to, nor does it require the reporting of, Hispanic attainment. In short, not only is the explicit aim of the policy unmeasured, policymakers have entirely excluded the assessment of the implicit ambition, service to Latino students.

Some scholars have argued that enrollment, retention, and graduation are effective measures of service to Latino students (Crisp et al., 2009; Flores & Park, 2013). Measures such as average SAT and ACT scores, acceptance rates, and endowment balances are valued within the narrative of high-quality universities as indicated by ranking systems (Sharif, 2015). However, comparing HSI performance to PWI performance using these factors alone leads to a skewed perception of the impact HSIs make on their Latino students (Garcia, 2019). Lower performance on organizational outcome factors is linked to student demographics and institutional funding, and is not indicative of inferior institutional performance (Garcia, 2013b; Nuñez & Elizondo, 2012; Rodríguez & Galdeano, 2015; Rodriguez & Kelly, 2014).

Other scholars have suggested that HSIs serve students in multiple ways, in addition to traditional measures, such as enhancing non-cognitive outcomes, sense of belonging, and cultural connections on campus (Dayton & Rogoff, 2013; Guardia & Evans, 2008; Sebanc et al., 2009).

Underscoring the crux of the debate about *serving* versus *enrolling*, Santiago (2012) claimed "enrolling Hispanic students by default without explicit institutional effort to recruit, retain, and graduate these students undermines the public policy intent and spirit of the HSI designation" (p. 165).

A specific definition of serving has remained elusive to researchers, although many have contributed to the conceptual development of the term. A systematic review of "servingness" revealed four themes: outcomes, experiences, internal organizational dimensions, and external influences (Garcia, Núñez, & Sansone, 2019). Institutions that adapt practices to better support Hispanic students are shifting toward serving, and doing more than enrolling (Garcia & Okhidoi, 2015). Qualities of service may include intentional practice, curricular adaptation, student self-efficacy, pedagogical practices, support services, and resource investment (Santiago & Andrade, 2010). Service may also include metrics that lead to achievement of those qualities of service such as gatekeeping course completion improvement, refined articulation agreements, and advocacy in policy and community spaces (Santiago, 2009). It can also include responsive financial aid packages, enhanced representation in disciplines lacking Latino students and faculty, and increased hiring of Latino administrators into key leadership positions (C. Santiago, 2012; D. A. Santiago, 2012).

**Theoretical Framework**

The investigation into HSI organizational identity and its impact on Latino students have led to research-based typologies. Nuñez et al. (2016) mapped the institutional diversity of Hispanic-Serving Institutions. Citing the growth of HSIs and the limitations of using the Carnegie Classification system alone to understand minority-serving institutions, the researchers drew from secondary data to create a conceptual model of HSI institutional diversity. Examining

systematic, programmatic, constituents, resource, and environmental diversity, a typology of six institutions emerged: urban enclave community colleges, rural dispersed community colleges, big-systems four-years, small community four-years, Puerto Rican institutions, and health sciences schools (Nuñez et al., 2016).

The findings in Nuñez et al. (2016) made a significant impact in how HSIs were conceptualized as it underscored to policymakers that student and institutional inputs beyond enrollment are necessary to consider when prescribing policy to a diverse body of institutions. However, delimitations of this scholarship were metrics of institutional diversity and excluded other factors significant in the HSI literature, most notably organizational and cultural identity.

Although the HEA frames HSIs by way of enrollment, this simplified and manufactured identity has not been accepted by students, faculty, and administrators at HSIs. HSI stakeholders identified the following additional values of *serving* as central to their organizational identity: regional focus, community commitment, dedication to access, and serving diverse students through cultural connection, co-creation, and confidence in abilities (Garcia, 2013a, 2016a). Thus, the self-conceptualization of HSI identity was not a question of either normative measures such as access and graduation or cultural measures such as cultural enrichment, but rather it was both.

"Focusing solely on enrollment and graduation rates creates a limited understanding of what it means to have an identity for serving Latina/o students" (Garcia, 2016a, p. 118). Formalizing this intersection of organizational outcomes and cultural outcomes, Garcia (2017) created the HSI identity matrix (see Figure 1. Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017).. The *Y* axis represents organizational outcomes for Latinx students, and the *X* axis represents cultural outcomes for Latinx students. Within the

spectrum of analysis are four types of HSIs: Latinx-Enrolling, Latinx-Enhancing, Latinx-Producing, and Latinx-Serving.

Within the typology, Garcia (2017) suggested four types of organizational identities. Latinx-enrolling are institutions that enroll the minimum students needed to achieve the HSI designation but do not produce equitable outcomes for Latinx students. Latinx-producing meet the minimum designation and produce positive organizational outcomes for Latinx students, but the institution lacks a Latinx focus within a culture of support. Latinx-enhancing do not produce equitable organizational outcomes for Latinx students but create an identity that normalizes Latinx ways of knowing and being. Finally, Latinx-serving enrolls a percentage of students to meet the HSI designation, produces equitable outcomes for Latinx students, and enhance racial experiences of Latinx students (Garcia, 2019).

Organizational outcomes are those affirmed in a White normative space, conceptualized as a sociohistorical and structural ideology directing a set of institutional practices, which serve some groups and exclude others (Garcia 2019; Hurd 2008). Such academic outcomes include graduation and persistence rates, transfer concerns such as limited credit loss and numbers of transfer students, and time to graduation, which values brevity over longevity (Contreras & Contreras, 2015; Garcia, 2019; Godreau et al., 2015).

Cultural outcomes are those that centralize the racialized experiences of and cultural ways of knowing for Latino students (Garcia, 2019). Cultural measures are nebulous by comparison to organizational measures, and may include student engagement, student self-efficacy, curricular cultural congruity, and campus environment (Arbelo-Marrero & Milacci, 2016; Cuellar, 2014; Garcia, 2019; Garcia & Okhidoi, 2015; Gonzalez, 2010; Murakami-Ramalho, Nunez, & Cuero, 2010). Researchers have been encouraged to consider as many

variables as possible related to servingness to capture the wide range of possibilities for enacting service to Latinx students (Garcia et al., 2019).

Garcia's (2017, 2019) work expands on the typology of Nuñez et al. (2016). It reinforces the heterogeneity within the HSI sector and pushes federal policymakers to consider the findings in funding determinations, thus recognizing that "some HSIs are better at producing legitimized outcomes while others excel when it comes to providing a culture that enhances the postsecondary experience for Latinx students" (Garcia, 2017, p. 129). Garcia's (2017) Typology of HSI Organizational Identities intentionally values all types of HSIs, without addressing the types as either stage-based or ranked.

This study examines Garcia's (2017) typology within a policymaking context. Hurtado, Alvarez, Guillermo-Wann, Cuellar, and Arellano (2012) connected diversity, student identity, institutional environment, policy context, and socio-historical context in the multicontextual model for diverse learning environments (DLE). The DLE goes further than other models by making an explicit connection between microsystems, mesosystems, and macrosystems. Specifically, the policy context "exerts pressure on institutions to act in specific ways, which in turn impact student experiences in college and postsecondary educational outcomes" (Hurtado et al., 2012, p. 93). Scholars have used the DLE as a framework to examine macrolevel impacts on microlevel outcomes (Cerezo & Chang, 2013; Cuellar, 2014; Cuellar & Johnson-Ahorlu, 2016; Garcia, 2016b; Hurtado, Alvarado, & Guillermo-Wann, 2015), but investigations of the influence of the microlevel on the macrolevel have not been conducted.

**History of Hispanic Recognition in Higher Education**

The course of educational access and attainment for Latinos in the United States has not been one of steady progression. Latinos advocated for federal recognition for more than 150

years, and although stunted by political inaction, advocates continued to make efforts to become visible on the federal radar (MacDonald, Botti, & Clark, 2007). Beginning in the 1970s, the U.S. Census Bureau made efforts to count the numbers of people living in the United States that were of "Spanish/Hispanic" origin (Cohn, 2010). During the same period, Chicano activism in education focused on issues of funding distribution, culturally responsive curriculum, and access. In higher education, Chicano student organizations demanded increased representation among students and faculty, as well as the creation of Chicano Studies Programs (Urrieta, 2004).

Assisted by the grassroots work of community activists, the higher education policy consortiums, such as the Hispanic Higher Education Coalition and the Hispanic Association of Colleges and Universities (HACU), pushed for a federal designation for post-secondary institutions enrolling significant portions of Hispanic students. Over two decades of political gamesmanship resulted in the inclusion of *Hispanic-Serving Institution* in the lexicon of the Higher Education Act of 1992 (P.L. 102-325) (Valdez, 2015). Proponents intended that the designation set apart institutions that validated the culture of Hispanic students while providing access to education and improving outcomes after graduation. However, the final designation criteria were not robust, and the definition which evolved through negotiation among stakeholders, ultimately only included one measure: enrollment (Valdez, 2015).

The reauthorization of the Higher Education Act in 1998 (P.L. 105-244) provisioned for significant changes in the definition of HSIs. The qualifying factors, which loosened to include part-time students in the count of qualifying students, were more reflective of the Hispanic student population. The reauthorization also eliminated the requirement that low-income students also be first-generation students, provided a unique placement in their own section of the Act (Title C), and increased funding (Title V) (MacDonald et al., 2007). Despite these significant

improvements, the designation continued to ignore originally intended aspects of cultural acknowledgement through centering the experience of Hispanic students, elevating HSIs as a crucial component of the post-secondary landscape in the United States.

## Profile of Hispanic-Serving Institutions

The Higher Education Act treats Hispanic-Serving Institutions monolithically, but the institutions that comprise the category are not homogenous. HSIs are diverse in many respects, including Carnegie Classification, governance, funding sources, geography, and student type. The pace at which HSIs have grown, nearly tripling in 30 years, is unprecedented (Hispanic Association of Colleges and Universities, 2018). As the numbers of HSIs grow, a nuanced understanding of the difference between HSIs is important so policymakers and practitioners can adjust priorities and practices.

**Institutional distribution.** According to the Hispanic Association of Colleges and Universities (2018), there were 189 HSIs in 1994. By 2008, the number had grown to 281 institutions, 150 institutions were two-year, and 131 were four-year institutions. Among the total number of institutions, 70% were public institutions (Hispanic Association of Colleges and Universities, 2008). As of 2018, there were 523 HSIs, representing 17% of the post-secondary sector. Overall, 53% were four-year institutions, and 68% were public (Hispanic Association of Colleges and Universities, 2018).

Adding approximately 15 institutions per year, the increase in the numbers of HSIs rivals that of the community college growth in 1960s-1970s and institutional growth during the Morrill Land-Grant era (Geiger, 2015). The number of institutions on the cusp of meeting the designation criteria indicate projected growth in the numbers of HSIs. Emerging Hispanic-Serving Institutions have an enrollment of undergraduate full-time equivalent students that is

between 15% and 24.9% Hispanic students (Santiago & Andrade, 2010). In 2006, there were 176 Emerging HSIs, which grew to 328 by 2018. Among Emerging HSIs, 67% were four-year institutions and 57% were public (Excelencia in Education, 2019; Santiago & Andrade, 2010).

Hispanic-Serving Institutions have traditionally been concentrated in geographic areas known for large Hispanic populations, but data have suggested this trend is less assured. A 69% majority of HSIs are located California, Texas, Puerto Rico, and New York (Excelencia in Education, 2019). In 2008, 18 locations contained HSIs (Hispanic Association of Colleges and Universities, 2008), and by 2018, the number of locations containing a HSI grew to 28 (Hispanic Association of Colleges and Universities, 2018). Emerging HSIs were located in 35 states in 2018 (Excelencia in Education, 2019). In short, HSIs are not only increasing in numbers but also diversifying in geographic location.

**HSI community colleges.** Latino students have overwhelmingly attended two-year colleges more often than four-year colleges (Pérez & Ceja, 2010). Significant college choice factors included distance from home and family involvement, even when other factors such as socioeconomic status was controlled (Calcagno, Bailey, Jenkins, Kienzl, & Leinbach, 2008; Gonzales, 2015). Further, geographic location and local demographic composition played a role in student body diversity, as did institutional type (Franklin, 2013). Thus, HSI community colleges are crucial to the education of Latino students within service regions.

Following increased enrollment at, and successful transfer from, community colleges by Latino students the completion rate was 34% at two-year HSIs in 2015 (Santiago et al., 2016). This stands in contrast to 30% graduation rate for Hispanic students and 32% graduation rate for White students at all two-year college types (National Center for Education Statistics, 2019). There is a clear need to better account for factors associated with Latino student success at

community colleges to ensure a readily available and highly skilled regional and national workforce (Santiago et al., 2016).

**Funding disparities.** Despite the significant size of the sector and impact on Hispanic student access, HSIs continue to be underfunded relative to other national average and by proportion of students served (Hispanic Association of Colleges and Universities, 2019). Although funding grew in the early years of HSI designation (MacDonald et al., 2007), funding proportions have not increased to be commensurate with sector growth. On average, HSIs received $3,117 per student from federal sources of revenue, whereas all degree-granting institutions received on average $4,605 per student, representing a 32% shortfall in federal funding (Hispanic Association of Colleges and Universities, 2019). Further, because 70% of HSIs are public institutions, they are especially vulnerable to fluctuations in state funding (St. John, Daun-Barnett, & Moronski-Chapman, 2018).

One area in which HSI funding has grown has been with the addition of the HSI STEM program in 2008. The U.S. Department of Education awarded $100 million to 80 institutions under this program (U.S. Department of Education, 2009a). A second grant competition was conducted in 2016 when $100 million were awarded to 92 institutions (U.S. Department of Education, 2017). The increase of dedicated funding was part of a national initiative to focus on eliminating the gap between the preparedness and the numbers of graduates in STEM fields and the need for a technologically competent labor force (Hegji, 2014).

**Student population.** HSIs enroll 66% of Latino undergraduates, despite being only 17% of the higher education sector (Excelencia in Education, 2019). According to the Excelencia in Education analysis of the 2015-2016 National Postsecondary Student Aid Study, 66% of Latino students in higher education were of Mexican or Puerto Rican descent, 98% were United States

citizens, and 84% were U.S. born. Second-generation immigrant students, those born in the United States to parents who were born in another country, represented 47% of students and third-generation or more represented 37% (Excelencia in Education, 2019).

Latino students were more likely to be first-generation college students, those students whose parents did not attend college (Excelencia in Education, 2019). More than 80% of Latino students lived off campus or with their parents, a rate higher by comparison to other racial groups (Excelencia in Education, 2019). More than 70% of Latino students worked 30 hours or more while enrolled in college, nearly 33% of female students cared for dependent children, and more than 50% of Latino students have a cumulative GPA of 3.0 or higher (Institute for Women's Policy Research, 2018). Although three-quarters of Latino students applied for and received financial aid, the average award to Latinos was 27% less than the average overall award (Excelencia in Education, 2019). Approximately 16% of Latino students pursue Science, Technology, Engineering, and Math (STEM) fields (Excelencia in Education, 2019).

## HSI Student Performance on Organizational Outcome Factors

Research has shown that the type of college Latino students attend impact student experiences (Cuellar, 2014; Flores & Park, 2015). When Latinos attend HSIs, Emerging-HSIs or Predominantly White Institutions there are practical implications for engagement, persistence, and attainment (Cuellar, 2014). These measures, however, are rooted in the racialized context of minority-institution subordination and, as a result, vital cultural factors are often overlooked (Garcia, 2019).

**Hispanic student enrollment factors.** Over the previous decade, total college enrollment rates for Hispanic 18- to 24-year-olds increased from 25% to 37% but gains in other racialized groups were only moderate (National Student Clearinghouse Research Center, 2017). At a rate of

66%, Latino undergraduates begin their education at a HSI (Excelencia in Education, 2019). Latino students are more likely to work, be the first in their family to go to college, and care for dependent children than African-American or Anglo-American students (Excelencia in Education, 2019). Each of these factors are likely to impact a student's ability to maintain enrollment and meet academic performance expectations.

Academically qualified Latino students tend to choose colleges closer to family and less costly rather than selective, but distant, institutions (Santiago, 2007). Community colleges represent 47% of the total population of HSIs, and 51% of Latino students begin their higher education at a two-year institution (Community College Research Center, 2019). Community colleges have played an important role in the democratization of higher education through their open-access policies (Dougherty, 1994b; Dowd, 2003). Further, these institutions have survived with close community connection and acknowledgement of a flexible mission (Vaughan, 1991, 2006). However, community colleges also exist within a stratified system where their role can be viewed as either subordinate to four-year institutions or gatekeeper designed to cool out aspirational students (Clark, 1960; Dougherty, 1994a; Dowd, 2007). Therefore, Latino student enrollment in community colleges may be viewed as a success story about access through the lens of white normative measures, but it may also be interpreted as the continued disproportionate stratification of racialized students in a system of "anticipatory subordination" (Brint & Karabel, 1991, p. 348; Ireland, 2015).

**Hispanic student completion factors.** Hispanic adults aged 25-34 with an associate degree or higher increased 9% from 2007 to 2017. Problematically, this only represents 28% of the identified population, and is nearly 10% behind Black and 30% behind White population groups (Miller, 2018). The Latino student completion rate for degrees earned from two- and

four-year institutions within six years was 46%, which was 9% lower than the national average and 15% lower than White students (Excelencia in Education, 2019). Latinos were overrepresented in certificate and associate groups and underrepresented in bachelor, master, and doctoral completions. In short, some outcomes have been increasing after decades of effort, and in some cases surpassed outcome measures for other minority groups (National Center for Education Statistics, 2019). Yet, overall measures still lag minority and majority comparison groups.

Latino students have a variety of unique risk factors impacting their likelihood of persistence and completion such as being first-generation college student, first-generation immigrant, and English-language learner status (Nuñez et al., 2011). Having little knowledge about college jargon, pace, and available support systems, students struggle to find early footing which might have set the strong foundation for later success (Arbelo-Marrero & Milacci, 2016; Gooden & Martin, 2014; Jacobo & Ochoa, 2011). Further, the disproportionate enrollment in less selective institutions has been negatively correlated with completion (Alon & Tienda, 2005; Horn, 2006; Melguizo, 2008).

Although Latino students face unique completion challenges, they can flourish academically with the right support structures (Arbelo-Marrero & Milacci, 2016; Nuñez et al., 2011). Researchers identified Latino preferences for institutions that are near home, extended family, and current employers to maintain family networks and financial resource systems, which aided in completion (Arbelo-Marrero & Milacci, 2016; Perrakis & Hagedorn, 2010).

**HSI Student Performance on Cultural Outcome Factors**

Student performance literature is often situated in the success framework examining internal and external student factors. A number of authors draw on the seminal work of Tinto's

(1975) Student Integration Model (SIM), and the extensions of this model by Terenzini and Pascarella (1991). At its core, the model relies on the concepts of social and academic integration for predicting student retention (Craig & Ward, 2007; Edman & Brazil, 2009; Musoba & Krichevskiy, 2014; Yosso, Smith, Ceja, & Solórzano, 2009). However, Tinto's original model has been criticized by some to inadequately frame the persistence of community college students, particularly in regard to the social integration limits in comparison to four-year universities (Halpin, 1990), ignoring cultural needs of students (Castillo et al., 2006), and for discounting financial support as a significant retention factor (Thomas, 2002). Evolution in undergraduate retention research has brought about revisions in models, particularly with respect to accessible academic, personal, and social support services (Tinto, 2000). Problematically, the explicit link to cultural outcomes with models of retention has not yet been made (Demetriou & Schmitz-Sciborski, 2011).

Moreover, student performance on cultural outcomes is not collected in the Integrated Postsecondary Education Data System (IPEDS) indicating a federal disregard for cultural performance factors (Espinosa, Crandall, & Tukibayeva, 2014). Without the federal requirement, each institution must determine the importance and method of collecting cultural outcome data, which creates inconsistency across the construct, presenting problems for policymakers, scholars, and HSI leadership.

**Peer performance factors.** As students persist at HSIs, their interactions with one another affect the overall educational experience in both negative and positive ways. Some researchers claim Latinos were more likely to live at home, less likely to engage in extracurricular activities, and experienced racially-related microaggressions, which had negative effects on performance and persistence (Witkow, Gillen-O'Neel, & Fuligni, 2012; Yosso et al.,

2009). From a relational standpoint, tension between racialized groups on campus take on a variety of undertones, which impact social and academic integration behaviors, central to models of retention and completion.

Yet, an equity-based connection with a group of similar others and diverse others is demonstrated to positively impact retention and completion (Cerezo & Chang, 2013; Cuellar, 2014). Having a variety of cultures integrated on a campus creates a normative environment for all students to increase understanding of others with different backgrounds and to have conversations with diverse ethnic others (Jones, 2013).

**Environmental congruity factors.** A review of the literature clearly demonstrates a confluence of factors affecting student success. With due consideration to factors such as age, gender, nationality, generational status, high school GPA, and college GPA, Cerezo and Chang (2013) found a significant relationship with student self-reported cultural congruity and performance. Using a sample of 113 Latino students at a PWI, a hierarchical multiple regression revealed connection with ethnic minority peers and cultural congruity explained a significant portion of academic success (Cerezo & Chang, 2013).

Moreover, when the perception of the university environment was removed as the mediator, no relationship between ethnicity and persistence was found (Castillo et al., 2006). At a PWI, a sample of 175 Latino students demonstrated significant small to moderate negative relationships between ethnic identity and college environment (Castillo et al., 2006).

Research about college environment has been conducted on instruments that were validated at PWIs (Holland, 1958; Pace, 1969; Walsh, 1973) where the dominating norms, values, and practices, cater to White students and in some cases, contribute to hostile learning environments for students of color (Chang, Sharkness, Hurtado, & Newman, 2014). Recognizing

this inadequacy, Gloria and Kurpius (1996) developed the first such scales normed with a Chicano sample to account for the relationship between college fit and student heritage.

Many scholars have investigated the sphere of cultural congruity, university environment, and educational outcomes as they pertaining to Latino students (Cuellar, 2012, 2014; Cuellar & Johnson-Ahorlu, 2016; Gloria, Castellanos, & Orozco, 2005; Gloria, Herrera, & Castellanos, 2016; Gloria & Kurpius, 1996). Since the foundational work of Gloria and Kurpius (1996) other scholars have used the scales at four-year universities with non-Chicano Hispanics, as well as non-Latino minorities, including African-Americans (Constantine, Robinson, & Wilton, 2002; Constantine & Watt, 2002; Reynolds & Weigand, 2010).

With higher education institutions dedicating financial and human resources to solving the problem of retention and completion, understanding the relationship between organizational and cultural outcomes variables is important. Institutions have little influence over individual student persistence, but increased influence on factors like cultural responsiveness and environment are known to positively impact student persistence and completion. Consider the growing collection of successful initiatives related to Latino student success in the Growing What Works Database managed by Excelencia in Education (Excelencia in Education, 2020). Shifting the ad hoc assessment of campus-based cultural factors from an optional practice to a requirement through federal policy efforts may help policymakers better match funding opportunity to funding needs and institutions best identify what works.

**Post-completion factors.** Hispanics represent the second largest and fastest growing ethnic group in the labor force. This population, however, is overrepresented in employment sectors that do not require post-secondary education, while the labor market is simultaneously demanding more workers in industries requiring degrees and certifications (Bureau of Labor

Statistics, 2017). The economic benefit of the degree is limited because Latino student completions are concentrated in certificate and associate levels. Latinos were less likely to be employed in high-paying occupations by comparison to other groups (Excelencia in Education, 2019).

Overall, students graduating from HSIs report positive experiences. In a study of 12 Hispanic-Serving Institutions, Latino graduates were more likely than the national average to report that the college environment was inclusive, their job was ideal and interesting, and they were thriving in five aspects of well-being: purpose, social, financial, community, and physical (Gallup, 2018). However, only 7% of graduates from HSIs, in comparison to 11% across the country, had an internship, a semester-long project, and extracurricular involvement. Further, 66% of study participants who visited the career services office indicated the services were difficult to access, and only 27% of Latino graduates indicated they were prepared for life outside of college (Gallup, 2018).

**Faculty performance factors.** Faculty diversity is a key component of academic excellence, as it performs an important part in diverse pedagogy and student access to role models (Hurtado et al., 2015; Umbach, 2006). Having access to diverse faculty plays a role in exposing students to multiple perspectives and experiences (Turner, 2015).

***Faculty impact.*** One of the most significant and frequent interactions in a college setting is between students and faculty (Musoba & Krichevskiy, 2014). Many faculty focus on the educational perspective of the student, with an aim to benefit the student, as opposed to those in administrative roles who view students through managerial lenses (Levin, Viggiano, López Damián, Morales Vazquez, & Wolf, 2017). For instance, faculty were more likely than administrators to recognize the complexity of changing student identities following shifts in the

labor market and in community demographics surrounding the campus (Levin et al., 2017).

Such recognition can be a catalyst to operationalize values of diversity. When diversity values were enacted, the cultural appreciation and educational attainment of Latino students was enhanced (Gloria et al., 2016). Naturally, not all faculty are competent or aware of such student demographic or institutional changes. Thus, cultural competency and humility training might benefit both faculty and students, and might be necessary for institutions experiencing demographic transitions (Gooden & Martin, 2014; Ladson-Billings, 1995).

With low faculty awareness to address persistence factors, first generation immigrant students struggled more with enculturation (balancing school and family values) (Aguinaga & Gloria, 2015). Faculty intimidation was a negative factor in Latino student persistence attitudes (Cuellar, 2014). Latinos were found to have lower levels of interactions with community college faculty as measured by responding to faculty questions, initiating questions addressed to faculty, talking with faculty before or after class, and visiting office hours (Chang, 2005).

Training and awareness on such topics are important to positively inform the nature of faculty and student interactions. For example, faculty may learn Spanish to help mediate English-language learner challenges and demonstrate cultural interest (Perrakis & Hagedorn, 2010). Latino students who felt encouraged by community college faculty were more likely to have social interaction and academic involvement, relevant elements in Tinto's Student Integration Model (Chang, 2005; Tinto, 1975). Finally, graduation rates for all students, both minority and majority, were positively affected by increased diversity of their faculty (Stout, Archie, Cross, & Carman, 2018).

***Faculty structural diversity***. Although diversity can and should be measured in a variety of ways, assessing structural diversity, or diversity by the numbers, has been demonstrated as a

relevant institutional factor (Shaw, 2009). Contreras (2018) examined faculty diversity in California, where 84% of community colleges are HSIs. Findings suggested that within the community college system, numbers of faculty on both tenure and non-tenure tracks trail building critical mass in comparison with students by more than three times (Contreras, 2018). This was of concern because of the number of Latinos served by California community colleges and the missed opportunity to have the increased benefit of Latino faculty. Similarly, Jackson and Phelps (2004) examined under represented faculty, finding representation ratios for Hispanic faculty declined, "indicating a significant gap in the college's ability to provide culturally relevant instruction to a rapidly growing Hispanic student population" (p. 82).

***Absence of faculty structural diversity.*** There are two common explanations as to why institutions do not hire faculty of color at a proportional rate: pipeline problems and color-line problems. The pipeline argument suggests there are too few faculty of color in the candidate pool (Cole & Arias, 2004; Lott & Rogers, 2011). This argument has some merit at four-year universities as descriptive statistics support the claim that smaller proportions of minority students graduate with Ph.D.'s than their White counterparts, with 61% of Doctoral degrees awarded to Whites, 7% to Blacks, and 6% to Hispanics (McFarland et al., 2017). However, a weakness in the argument ignores historical bias in hiring and promotion practices (Hurtado, Milem, & Clayton-Pedersen, 1999; Maher & Tetreault, 2011). The color-line argument addresses this gap and suggests there is implicit discrimination in hiring practices (Price et al., 2009) and disparate treatment, such as inequity in tenure and devaluing of research, which cause faculty of color to quickly depart (Association for the Study of Higher Education, 2007; Jackson-Weaver, Baker, Gillespie, Ramos Bellido, & Watts, 2010; Ladson-Billings, 1995; Taylor, Apprey, Hill,

McGrann, & Jianping, 2010). Hispanic faculty members are, like other faculty of color, vulnerable to racial stratification.

**Clusters of Organizational and Cultural Outcomes**

A significant body of research has evolved around Hispanic-Serving Institutions. At this time, scholars and practitioners know more about students, pedagogy, leadership, and curricula impact on Hispanic student enrollment and attainment than was known when Title V policymakers introduced the HSI designation. Yet, research which attempts to define service to Latino students is either focused on organizational outcomes or cultural outcomes, but rarely both.

As an exception, Garcia (2013; 2016; 2019) described a rich tapestry of interwoven factors all relevant to the service of Hispanic students, best summarized in the Typology of HSI Organizational Identities. The proposed typology, however, is insufficient in generalizability and scalability of findings because of methodological limitations (Merriam, 1997; Yin, 2003). The qualitative research methods used by Garcia (2017, 2019) in development and fleshing out the matrix are both labor- and time-intensive, requiring an intimate knowledge of each institution. As such, the degree to which federal policymakers can use the theorized matrix is limited. Therefore, there is a literature gap that may build on the framework proposed by Garcia (2019) and move the work of conceptualizing HSI identity at a macro level.

**Chapter Summary**

Hispanics have sought recognition and equal treatment by the federal government for centuries. The Higher Education Act of 1992 (P.L. 102-325) recognized post-secondary institutions that served critical masses of Hispanic students and designated the institutions as Hispanic-Serving. The nomenclature implies a significant value on efforts to serve students,

however, the policy is silent on aspects known to serve students in culturally meaningful ways. Scholars and professionals have sought an understanding of what it means for an institution to be *serving* versus *enrolling*. Although no consensus exists about the definition of service, scholars agree that centering Hispanic student cultural ways of knowing is integral in a service-focused institutional culture. Unfortunately, the normative measures of performance do not account for the cultural benefit of HSI attendance, and links between organizational outcomes and cultural outcomes have been theoretical, qualitative, or within discrete contexts. Thus, there is a need to understand HSI identity through organizational and cultural lenses at a quantitative macro-level so federal policy can be responsive to differences among HSIs.

Chapter Two summarized the literature associated with the research questions investigated by the present study. Chapter Three details the methodology, including the data collection and analysis procedures used. Chapter Four reports the research findings, and a detailed discussion of the results occurs in Chapter Five.

# CHAPTER III

# METHOD

There is a need to distinguish between what it means to be Hispanic-enrolling and Hispanic-serving at Hispanic-Serving Institutions (HSI). Scholars have attempted to address this question of identity and practice of serving, primarily through qualitative approaches. Using a case study approach, Garcia (2017) proposed a Typology of HSI Organizational Identities to distinguish between HSIs. Given the fast pace of HSI growth, and the importance of student success at HSIs to national interests, it is important to better understand the grouping differences among HSIs on a macro level. Thus, a quantitative understanding of the groupings amongst Hispanic-Serving Institutions is necessary. This study addresses this gap through a quantitative examination of the clusters among organizational outcomes, cultural outcomes, and the extent to which the types of outcomes affect clusters among HSIs.

This dissertation seeks to address the following research questions:

1. What homogeneous clusters of Hispanic-Serving Institutions emerge based on organizational and cultural outcome variables?
2. To what extent does cluster assignment differ by cultural outcome variables?
3. How can institutional websites be used as cultural artifacts to further distinguish between clusters?

## Taxonomy and Clusters

Garcia (2019) proposed a Typology of HSI Organizational Identities based on empirical qualitative research. Such structures for knowledge organization are beneficial because classification helps to explain, compare, and test theories about the world (Bailey, 1994). While typologies are primarily conceptual, taxonomies are primarily empirical. This study examined

the classification of "cases according to their measured similarity on observed variable," (Bailey, 1994, p. v) and thus is a taxonomy. Rich (1992) suggested organizational taxonomies must be quantitatively based and offer a purposeful conceptualization. Furthermore, effective taxonomies are characterized by range, depth, and opportunity for a meaningful subgroup analysis.

A TwoStep cluster analysis was employed to create the taxonomy. TwoStep cluster analysis uses algorithms in a systematic process to determine the clusters of data while accounting for known problems with traditional clustering procedures. Economic, biological, and medical disciplines have traditionally used cluster analysis. Within the social sciences, psychology, criminology, and urban planning have used the analytical technique. Cluster analysis is frequently used to understand individuals. Martin (2018) and Lui Abel (2008) used the approach to understand institutions. To the knowledge of the investigator, cluster analysis has not been used in the exploration of HSI segmentation. TwoStep cluster analysis was advantageous over *k*-means or hierarchical cluster analysis because it permitted both categorical and continuous data and was scalable for large datasets (IBM Corp., n.d.-b).

**Population and Sample**

The population of the study is Hispanic-Serving Institutions. There is not one national source for a definitive list of eligible HSIs. Thus, the sample was created by identifying institutions and including those that meet eligibility criteria. HSIs were identified by comparing the two most recent years of institutional lists from Excelencia in Education, Hispanic Association of Colleges and Universities, The Carnegie Classification of Institutions of Higher Education, and the U.S. Department of Education.

Sample eligibility was determined by list agreement. Institutions found on the lists of two or more sources in the same publication year met the list agreement factor. Institutions that

appeared on only one of the four source lists were excluded. The cluster analysis included 530 institutions. Among them, nearly half were community colleges, and more than 75% were public institutions.

**Data Collection**

Data were collected from primary and secondary sources. Organizational outcome data, which are described as white-normative measures by Garcia (2019) are traditionally valued by PWIs and within public policy settings. These data are readily available through public data sources. However, cultural outcome data are less readily available. These data are described as measures of the ways in which an organization centralizes the racialized experiences of Hispanic students (Garcia, 2019). Thus, cultural-related data were contracted from third parties which administer nationally recognized surveys that examine campus culture and collected by the principle investigator to account for the ways in which institutions centralize Hispanic student experiences.

**Organizational Outcome Data**

Secondary data were collected from multiple sources. The Integrated Postsecondary Education Data System (IPEDS) is a self-report survey data collection conducted by the U.S. Department of Education's National Center for Education Statistics. The U.S. Department of Education requires institutions to participate in annual data reporting to remain eligible to receive federal aid. Data were identified and downloaded from the 2017 reporting year.

The College Scorecard is a transparency initiative led by the U.S. Department of Education which includes all undergraduate degree-granting institutions of higher education. The variables used from this source include institutional minority-serving status, loan repayment

rates, total degrees awarded, and degrees awarded by program. Data were updated to the Scorecard in October 2019 and reflected measurements for Academic Year 2017.

Additional data were obtained from the U.S. Treasury Department to provide median earnings after departing the institution six years from the time of measurement. The six-year earnings group represented the 2010 cohort. Thus, these data lag the sample and will not be available for all institutions, as some have first become HSIs since that time. Table 1 provides a summary of organizational outcome data, level, and source.

Table 1

*Summary of Organizational Outcome Data*

| Variable Name | Description | Level | Range | Source |
|---|---|---|---|---|
| Admissions-Rate | DRVADM2017_RV.Percentadmitted, admissions rate is a calculation of the number of accepted by the number of applications | continuous | 0-100 | IPEDS |
| Yield-Rate | DRVADM2017_RV.Admissionsyield, yield rate is a calculation of the number attended by the number of accepted | continuous | 0-100 | IPEDS |
| SATVR25 | SAT Evidence-Based Reading and Writing 25th percentile score | continuous | 210-750 | IPEDS |
| SATVR75 | SAT Evidence-Based Reading and Writing 75th percentile score | continuous | 260-790 | IPEDS |
| SATMT25 | SAT Math 25th percentile score | continuous | 210-780 | IPEDS |
| SATMT75 | SAT Math 75th percentile score | continuous | 338-800 | IPEDS |
| ACTCM25 | ACT Composite 25th percentile score | continuous | 1-34 | IPEDS |
| ACTCM75 | ACT Composite 75th percentile score | continuous | 9-35 | IPEDS |

(Table 1 continued)

| | | | | |
|---|---|---|---|---|
| Transfer.Rate.H | A calculated percentage of number of Hispanic students transferred into the institution by the number of total Hispanic students at the institution | continuous | 0-100 | IPEDS |
| UPGRNTP | Percent of undergraduates awarded Pell grants | continuous | 0-100 | IPEDS |
| Retention.Rate.FT | EF2017D_RV.Full-timeretentionrate, Retention rate is a calculation of first-time degree/certificate seeking students enrolled full-time in the fall of the prior year that are either still enrolled in the fall of the current year or have completed their program in that time. | continuous | 0-100 | IPEDS |
| Retention.Rate.PT | EF2017D_RV.Part-timeretentionrate, Retention rate is a calculation of first-time degree/certificate seeking students enrolled part-time in the fall of the prior year that are either still enrolled in the fall of the current year or have completed their program in that time. | continuous | 0-100 | IPEDS |
| Part-time student rate | A calculation of the number of part time undergraduate student enrollment divided by the number of total student enrollment | continuous | 0-100 | IPEDS |
| 6.year.bachelor | DRVGR2017_RV.Graduationrate-Bachelordegreewithin6years, total cohort | continuous | 0-100 | IPEDS |
| 6.year.bachelor.H | DRVGR2017_RV.Graduationrate-Bachelordegreewithin6years, Hispanic students | continuous | 0-100 | IPEDS |
| Graduation Parity | Calculation of 6-year Hispanic graduation rate subtracting 6-year Total cohort graduate rate | continuous | -100-100 | IPEDS |
| 200% Graduation Rate | GR200_17_RV, number of bachelor's degrees or certificates within 200% of normal time, total cohort | continuous | 0-100 | IPEDS |
| STEM graduates, all undergraduates | CTOTAL for CIPs (CS/11, ENG/14 & 15, BIO 26, MTH 27, SCI 40) | continuous | 0-100 | IPEDS |

*Note.* Secondary data source variable names provided in description when available.

**Cultural Outcome Data**

The cultural variables in this study encapsulate the six indicators identified in the original work of Garcia (2017). Portions of data were obtained through the purchase of a specialized data request from the National Survey of Student Engagement (NSSE). Created in 1998, the NSSE reports on four themes and ten engagement indicators. The four themes are academic challenge, learning with peers, experiences with faculty, and campus environment. In addition, NSSE reports participation in high-impact practices such as learning communities, service-learning, and research initiatives. These four themes and the high-impact practices correspond to the types of cultural outcomes indicated by scholars (Garcia, 2013b, 2019; Garcia & Okhidoi, 2015; Nuñez et al., 2011). For example, data on campus environment are collected by NSSE, and Cerezo and Chang (2013) determined cultural contiguity on campus positively impacted Latino student performance on organizational outcomes.

Data were acquired from the Community College Survey of Student Engagement (CCSSE), which is similarly designed to measure the extent community college students are engaged in meaningful educational practices. CCSSE reports on five benchmarks: active and collaborative learning, student effort, academic challenge, student-faculty interaction, and support for learners. These benchmarks correspond to the types of cultural outcomes indicated by scholars (Garcia, 2013b, 2019; Garcia & Okhidoi, 2015; Nuñez et al., 2011). For instance, data on the quality of student-faculty interactions are collected by CCSSE, and Chang (2005) found Latino students who were encouraged by community college faculty were more likely to have social interaction and academic involvement, both relevant to performance on organizational outcomes.

There is extensive overlap between the constructs measured by NSSE and CCSSE instruments which was advantageous in data analysis. Full examples of the survey instruments were found at each organization's website. Approximately 70% of the items measuring engagement on NSSE appeared on the CCSSE in 2008 (Marti, 2008). Likewise, the psychometric properties of both surveys have been extensively examined and found to meet construct validity, reliability through multiple demographics, and temporal stability at the institutional level for more than a decade (Angell, 2009; Community College Survey of Student Engagement, 2019; Fosnacht & Gonyea, 2018; Miller, Sarraf, Dumford, & Rocconi, 2016; National Survey of Student Engagement, 2019).

The U.S. Census Bureau was an additional source of data. American Community Survey data were obtained for 2017 to determine Hispanic population and median pay estimations by county. Community data are relevant to the present study as aspects of Hispanic population density, wealth, and education may influence post-secondary participation, particularly at community colleges. Table 2 provides a summary of all cultural outcome data, level, and source.

**IRB Approval**

Institutional Review Board approval is required for projects involving human subjects. This research study is a systematic investigation designed to contribute to generalizable knowledge, but no human subjects are involved. Data were obtained from secondary sources and collected without human subject interaction. Further, no identifiable confidential information was held during the investigation, again negating IRB approval requirement. Nonetheless, all data were handled carefully, stored in a password protected environment to maintain its integrity. The Application Form for Exempt Research was submitted in accordance with the instructions, and a Letter of Exemption was received (see Appendix).

Table 2

*Summary of Cultural Outcome Data*

| Variable Name | Description or Measure | Level | Range | Source |
|---|---|---|---|---|
| Data were available via CCSSE/NSSE | Y/N | binary | 0-1 | CCSSE/NSSE |
| Weekend/evening college (SLO7) | Y/N | binary | 0-1 | IPEDS |
| Academic/Career counseling (STUSRV2) | Y/N | binary | 0-1 | IPEDS |
| On-campus daycare (STUSRV8) | Y/N | binary | 0-1 | IPEDS |
| ACTCOL | Active and Collaborative Learning, the self-reported perception of involvement with educational efforts | continuous | 1-5 | CCSSE |
| SEF | Student Effort, the self-report perception of time on task, preparation and use of campus services | continuous | 1-5 | CCSSE |
| ACH | Academic Challenge, the self-reported extent to which students are exposed to challenging mental activities including quantitative and qualitative activities | continuous | 1-5 | CCSSE |
| SFI | Student Faculty Interaction, faculty communication, future planning, and impact | continuous | 1-5 | CCSSE |

| | | | | |
|---|---|---|---|---|
| SLR | Support for Learners, the college's advising, counseling, and other services | continuous | 1-5 | CCSSE |
| HO | Higher-Order Learning: Amount coursework emphasized challenging learning tasks including applying learned information to practical problems, analyzing ideas and experiences, evaluating information from other sources, and forming new ideas from various pieces of information. | continuous | 1-5 | NSSE |
| RI | Reflective & Integrative Learning: How often students made connections with prior knowledge, other courses, and societal issues, considered diverse perspectives, and reflected on their own views while examining the views of others. | continuous | 1-5 | NSSE |
| LS | Learning Strategies: How often students enacted basic strategies for academic success, such as identifying key information in readings, reviewing notes after class, and summarizing course material. | continuous | 1-5 | NSSE |

| | | | | |
|---|---|---|---|---|
| QR | Quantitative Reasoning: How often students engaged with numerical and statistical information across the curriculum, and used this information to reach conclusions, examine real-world problems, and evaluate what others have concluded. | continuous | 1-5 | NSSE |
| CL | Collaborative Learning: How often students collaborated with others in mastering difficult material by asking for help, explaining material to others, preparing for exams, and working on group projects. | continuous | 1-5 | NSSE |
| DD | Discussions with Diverse Others: How often students had discussions with people who differ from themselves in terms of race or ethnicity, economic background, religious belief, or political views. | continuous | 1-5 | NSSE |
| SF | Student-Faculty Interaction: How often students had meaningful, substantive interactions with faculty members and advisors, such as talking about career plans, working on committees or student groups, discussing course material outside of class, or discussing their academic performance. | continuous | 1-5 | NSSE |

| | | | | |
|---|---|---|---|---|
| ET | Effective Teaching Practices: Amount instructors emphasized student comprehension and learning with clear explanations and organization, use of illustrative examples, and providing formative and effective feedback. | continuous | 1-5 | NSSE |
| QI | Quality of Interactions: How students rated their interactions with important people in their learning environment, including other students, advisors, faculty, student services, and other administrative staff members. | continuous | 1-5 | NSSE |
| SE | Supportive Environment: Amount the institution emphasized help for students to persist and learn through academic support programs, encouraged diverse interactions, and provided social opportunities, campus activities, health and wellness, and support for non-academic responsibilities. | continuous | 1-5 | NSSE |
| NPT41 | Average net price for $0-$30,000 family income | continuous | 0-100,000 | College Scorecard |
| NPT42 | Average net price for $30,001-$48,000 family income | continuous | 0-100,000 | College Scorecard |
| NPT43 | Average net price for $48,001-$75,000 family income | continuous | 0-100,000 | College Scorecard |

| | | | | |
|---|---|---|---|---|
| NPT44 | Average net price for $75,001-$110,000 family income | continuous | 0-100,000 | College Scorecard |
| NPT45 | Average net price for $110,000+ family income | continuous | 0-100,000 | College Scorecard |
| GRAD_DEBT_MDN | Median debt for students who have completed | continuous | 0-100,000 | College Scorecard |
| MD_EARN_WNE_P6 | Median earnings of students working and not enrolled 6 years after entry | continuous | 0-100,000 | College Scorecard |
| HACU membership | Y/N | binary | 0-1 | HACU website |
| Percent Hispanic instructional staff/faculty any track | XHRHISPT | continuous | 0-100 | IPEDS |
| Percent Hispanic administrators | XHRHISPT | continuous | 0-100 | IPEDS |
| County.Hispanic | Estimated percent of county residents, Hispanic, any | continuous | 0-100 | Census |
| County Hispanic population rate change | Calculation of Hispanic population percent 2010 subtracted from Hispanic population percent 2017 | continuous | 0-100 | Census |
| County.Salary | Average salary in county for advanced degree holders or higher | continuous | 0-4,700,297 | Census |
| Tuition. Core Rev. | Percentage of tuition as a part of core institutional revenue | continuous | 0-100 | IPEDS |
| State. Core Rev. | Percentage of state appropriations as a part of core institutional revenue | continuous | 0-100 | IPEDS |
| GovtGrant. Core Rev. | Percentage of government grants as a part of core institutional revenue | continuous | 0-100 | IPEDS |

| | | | | |
|---|---|---|---|---|
| Instruction CoreExp. | Percentage of instructional expenses as a part of total core expenses | continuous | 0-100 | IPEDS |
| Title V grant eligible | Y/N | binary | 0-1 | ED |
| Years as HSI | Years as HSI | continuous | 0-22 | Excelencia in Education |
| Instructional Staff/Faculty Salary | Average salary of instructional staff | continuous | 0-24,729,217 | IPEDS |
| Accreditation region | ACCJC, HLC, MSCHE, MSA-CESS, NECHE, NWCCU, SACSCOC, WSCUC | categorical | 0-6 | IPEDS |
| Geographic Region | State (incl. Puerto Rico & D.C.) | categorical | 0-51 | IPEDS |
| Degree Level offered | Carnegie Classifications | categorical | 0-3 | IPEDS |
| Organization Control | Public or Private | binary | 0-1 | IPEDS |

*Note.* Secondary data source variable names provided in description when available.

**Data Analysis**

Data were collected and imported into the Statistical Package for Social Sciences (SPSS) (IBM Corp., 2017). Mean, standard deviation, and further descriptive statistics were calculated for all institutional cases and variables. This analysis helped determine outliers within the dataset and any violations of assumptions (IBM Corp., n.d.-b; Sprinthall, 2012).

The first stage of TwoStep cluster analysis in this study was to group institutional profiles into pre clusters using a sequential clustering approach. The second stage in TwoStep cluster analysis was to use hierarchical clustering algorithm to explore a range of possible groupings and reduce to the best number of clusters. Log-likelihood measured the distribution on the variables.

Ultimately, the procedure identified latent clusters of cases with similar profiles and generated classes that were exclusive and exhaustive (Fleury, Grenier, & Bamvita, 2015; Tan et al., 2006).

Although the typology proposed by Garcia (2019) suggested four possible clusters, the number of clusters remained open and was determined based on Schwarz' Bayesian information criterion (BIC). The BIC provides objective criteria to avoid arbitrarily reducing clusters as in traditional clustering techniques (Norušis, 2012). According to Norušis (2012) the silhouette measure of cohesion and separation must be positive to indicate the within-cluster and between-cluster distances are valid. Further validation is determined because of significant difference amongst clusters, and the final cluster solution must be similar when halved.

Multivariate Analysis of Variance (MANOVA) was used to determine the omnibus effect of cluster assignment on cultural outcomes (Gamst et al., 2008). Further one-way variance explorations were used to determine significant differences between clustered groups with respect to cultural variables. Based on canonical weighting derived in MANOVA, significant variables were those determined to have absolute values greater than the critical values when alpha was set at 0.05 (Meyers et al., 2016). Leveraging the power of MANOVA, a canonical variable was derived which identified the weighting of cultural variables to the overall effect (Grice & Iwasaki, 2007).

A rubric was created to determine the extent to which institutions centralized the experiences of Hispanic students as communicated on the college or university website. Data were used to enrich the description of the clusters and better differentiate between them. Further, cultural data which centralize Hispanic student experiences were not available from a national resource, thus the website review was used to bring attention back to serving Hispanic students.

**Data Reporting**

The cluster distribution and cluster profiles were described. Cluster results were scrutinized to determine overlap with the typologies developed by Garcia (2017) and Nuñez et al. (2016). A key component of taxonomy development is meaningful distance between clusters, with identifiable differentiating factors between groups (Hennig, Meila, Murtagh, & Rocci, 2015). A website review of two institutions nearest each centroid was used to illustrate the key components of identified clusters and meaningful differences between the clusters.

Mirroring the growth and use of websites in the private sector, higher education institutions are increasingly spending money to establish identity and recruit applicants (Anctil, 2008; Schneider & Foot, 2004). However, institutions invest differentially into maintaining and improving website content, as well as use websites for different purposes (Astani & Elhindi, 2008; Iloh, 2014; Margolin, Miller, & Rosenbaum, 2013). Broadly, websites have been used to establish identity, convey admissions and environmental content, and build relationships with target audiences (Kittle & Ciba, 1999; Poock & Lefond, 2001). Website quality is a general trust-promoting factor (Nilashi, Jannach, bin Ibrahim, Esfahani, & Ahmadi, 2016).

In this research, website quality was assessed by information usability, information quality, and overall website quality as described by Nilashi et al. (2016). If the website of the institution nearest the centroid did not meet criteria for selection, the next closest centroid institution website was evaluated for use. After a quality website was identified, a rubric-guided content analysis was conducted to describe its representativeness of the cluster.

A rubric was developed to guide analysis of an institution's efforts to centralize the experiences of Latino students at Hispanic-Serving Institutions (see Table 3). Constructs of the rubric are as follows: Curricular/Co-Curricular, Student Support, Advising, Professional Development, and Institutional. Each construct contained a set of sub-questions to determine the

presence or non-presence of the existence of prioritized Latino-student experiences. For example, to determine the extent to which an institution prioritizes Latino-student curricular or co-curricular experiences, five questions were answered: (1) Does the institution offer a racialized curriculum or program, such as Latino/a Studies?, (2) Does the institution offer a racialized course, such as History of Chicano/a Activism?, (3) Is there a Latino student organization at the institution?, (4) Are there critical or celebratory events centered on racialized experiences such as Hispanic Heritage month events, dialogues regarding diversity and equity, etc.?, and (5) Does the institution offer career development services, internships, practicums, or service learning?

Table 3

*Website Review Rubric*

| Construct | Description |
|---|---|
| Curricular/ Co-Curricular | Does the institution offer a racialized curriculum or program, such as Latino/a Studies? |
| | Does the institution offer a racialized course, such as History of Chicano/a Activism? |
| | Is there a Latinx student organization at the institution? |
| | Are there critical or celebratory events centered on racialized experiences such as Hispanic Heritage month events, dialogues regarding diversity and equity, etc.? |
| | Does the institution offer career development services, internships, practicums, or service learning? |
| Student Support | Does the institution offer student support for academic performance such as a writing center, tutoring center, or learning lab? |
| | Are the student support services accessible to all students, particularly those that may attend part time? |
| | Does the institution offer student support services for students in need, addressing either housing, food insecurity, health care and/or childcare? |

| | |
|---|---|
| Advising | Does the institution subscribe to an advising model that may be considered developmental or intrusive? |
| Professional Development | Do faculty receive training to address culturally relevant pedagogical practices? |
| | Do staff and faculty receive diversity and inclusion training? |
| | Do front-line professionals receive customer service training? |
| Institutional | Does the institution embrace bilingualism? |
| | Does the institution have a formal policy on diversity and inclusion? |
| | Is the term Hispanic-Serving included in the mission, vision, or values statement of the institution? |

Each factor was used to richly describe the ways in which the institutions serve as cluster representatives from an evaluative frame (Ellet, 2007; Hays & Singh, 2012). Capturing the essence of the cluster via website review provided indicators specific to Latino cultural considerations on campus.

**Assumptions**

TwoStep cluster analysis assumes cases, or the objects that are to be clustered, have complete data profiles. To address missing data among cases, variable means may be imputed. However, in this study, cases with substantial amounts of missing data were eliminated, and no variable values were imputed. Log-likelihood assumes continuous variables are normally distributed and categorical variables are multinomial. In addition, the log-likelihood distance measure assumes variables are independent. In cases where the assumptions tests are unmet, analysis continued. The analysis procedure is robust to violations of the assumption of independence and of the distributional assumptions and continuing with awareness of violations is recommended (IBM Corp., n.d.-b). For each analysis, the alpha level was set at 0.05, except

the analysis of the canonically derived variable which was set at 0.001 (Neufeld & Gardner, 1990).

To use MANOVA, dependent variables are assumed to be multivariate and normally distributed within each group. Absence of multicollinearity was checked by conducting correlations among the dependent variables. Equality of covariance matrices was examined with Box's *M* test, $p = .001$. Post-analysis statistics of Pillai's trace and Wilk's Lambda were used to assess the contribution of each dependent variables to the overall model (IBM Corp., n.d.-a). Finally, Fishers Least Significant Difference (LSD) was used to determine significance between group differences which, when used with 3 groups, is protected from inflated Type 1 error (Hayter, 1986; Seaman, Levin, & Serlin, 1991).

**Limitations**

As with most studies, there are limitations to the validity and generalizability of the findings. This research faced limitations in data use and availability, as well as the operationalized use of Latino students and faculty as extensions of institutional research subjects.

The use of secondary data includes multiple weaknesses. Foremost among the weaknesses is that institutions self-report information, so the possibility of error exists. For example, although IPEDS data collection tools include instructions for input, individuals may misunderstand the instruction or make a typographical error in entry. In addition, the way IPEDS measures are defined and named may be misleading. For example, graduation rate only includes first-time full-time students, which excludes substantial portions of students in the count, but broader measures such as outcome reports do not collect information on attainment by race.

Further, IPEDS and College Scorecard data are only available at the institutional level, limiting the more precise analysis by campus, which is potentially more strongly linked to

community and cultural demographics. Similarly, the use of U.S. Census Bureau data is limited because of self-report, and the use of population estimates in non-census years.

The use of secondary data created a lag in collecting, analyzing, and reporting of multiple years. Data were collected for the most recent year available, but not all data were available in the same year. Further, some measures, such as post-graduation income, are intentionally reported years after a student departs the institution. In this way, data, HSI status, and contemporariness may not align perfectly.

This research is limited by the treatment of Hispanics as a pan-ethnic group. Data are commonly collected with Hispanic as an umbrella term referring to the heredity of individuals from Mexico, Puerto Rico, Cuba, and other Spanish-speaking lands or cultures. Details of the reported subcategories of ethnicity are not readily available. Some research has found important within group differences (Gonzalez, 2010; Nuñez & Crisp, 2012; Ponjuan, Palomin, & Calise, 2015). Okamoto and Mora (2014) suggested this pan-ethnic treatment is institutionalized and has cross-field impact. Without available data, within-group differences among those who self-identify as Hispanic are not detectable.

Finally, Dowd (2003) suggested that community colleges have different missions and purposes than universities, and as such their student engagement varies. This dissertation research does not consider aspects of cultural or organizational outcome data that may be more relevant or less relevant to a community college setting, even though nearly half the population are community colleges. An exploration of sub-clusters based on two- and four-year institutional type was warranted, but only data relevant in both clusters was examined for use in clustering.

**Chapter Summary**

There is a need to determine the evolved clusters of Hispanic-Serving Institutions. This study addressed the need by employing secondary and primary data. Data were downloaded from secondary sources and analyzed with TwoStep cluster analysis and MANOVA techniques. Findings were scrutinized for overlap with typologies developed by Garcia (2017) and Nuñez et al. (2016), and cluster centroids were described using a website content analysis approach to illustrate key points of similarity and difference.

This chapter summarized the methodological approach in this study and described the methodological limitations. Chapter Four details the results of the analysis and includes data summary tables. Finally, Chapter Five provides a discussion of findings, implications, and recommendations for future research.

# CHAPTER IV

# RESULTS

The purpose of this quantitative study was to identify the groups that occur among the heterogeneous Hispanic-Serving Institution (HSI) population when organizational and cultural outcomes are clustered using TwoStep cluster analysis. To better determine what it means to serve Hispanic students, cultural data were added and used to further distinguish between clusters. Chapter Four provides a detailed review of the assumptions testing and analysis results. Also included in this chapter is a narrative description of the institutional clusters which may aid policymakers and researchers in determining cluster characteristics. Study design and results are represented by Figure 3.

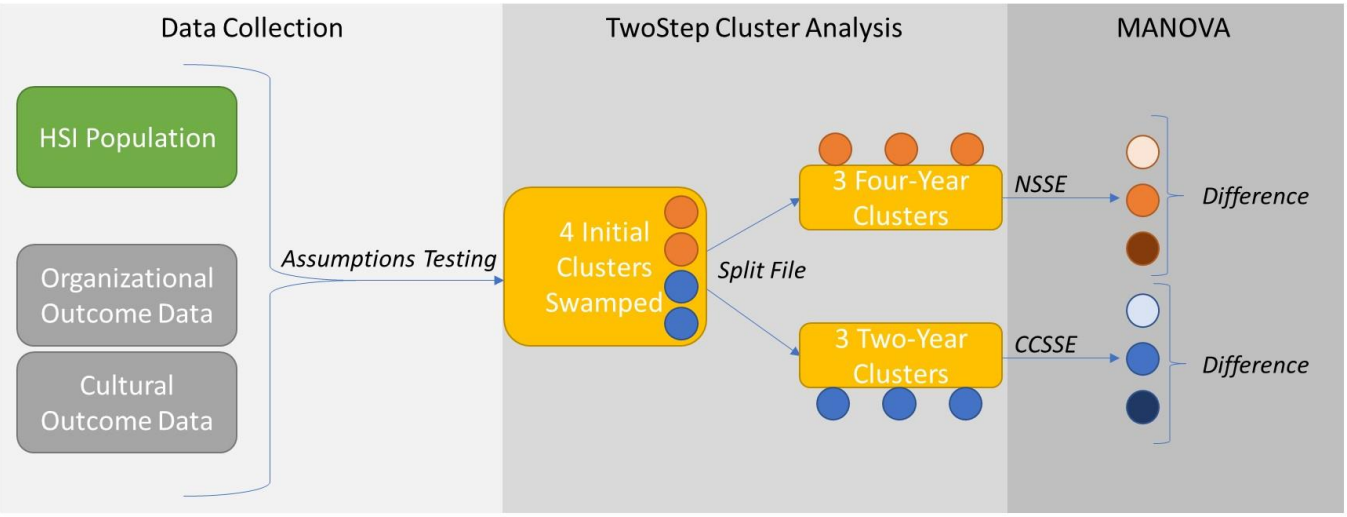


*Figure 3.* Analysis and results diagram.

After data were prepared and tested for assumptions, the initial cluster analysis revealed four clusters which were swamped by Carnegie Classification. Further examination revealed three four-year sub-clusters and three two-year sub-clusters. Additional cultural data were

analyzed and significant differences in five of 15 cultural variables were identified. Overall, two-year cluster assignment explained 17% of variance in CCSSE cultural variables in the two-year clusters, and four-year cluster assignment explained 17% of variance in NSSE cultural variables, both to small effect. Table 4 provides a summary of each cluster resulting from analysis of public data alone. Table 5 provides a summary of each cluster including differences in privately held cultural data sources and institutional website review.

**Data Preparation**

The data in the study consisted of 530 institutional cases and 56 variables with data collected between 2010 and 2017. Data were extracted from the Integrated Postsecondary Education Data System (IPEDS), College Scorecard, and the U.S. Census Bureau. Data sources were combined in Microsoft Excel and matched by Unit ID or FIPS County Code using the VLOOKUP procedure.

**Assumptions Testing**

Although TwoStep cluster analysis results are robust against violation of assumptions, the dataset was analyzed for meeting assumptions. The first assumption is that cases have complete profiles. A striking amount of missing data were discovered in 529 cases and 56 variables. Three institutional cases were eliminated from the sample because a substantial amount of data were missing. Among the variables, 14 were eliminated because 25% or more of the data were missing, e.g. percent of transfer students, percent awarded Pell, debt after completion, 200% time graduation rate, median earnings after completion, state appropriations as a percentage of core revenue, etc. The final remaining cases are displayed in Table 6 by accreditation region which provides context to the geographic distribution. Table 7 displays the remaining cases by HACU membership, a surface level indicator of an institution's embrace of a HSI identity.

The second assumption of TwoStep cluster analysis is that values have normal distribution. Using the Shapiro-Wilk test, 42 variables were examined, and 25 did not violate the assumption of normality ($p > 0.05$), indicating normal distribution. Remaining variables were examined for skewedness but retained for analysis, prioritizing awareness above elimination for violation (IBM, n.d.).

The third assumption of independence was explored using Pearson's Bivariate Correlation. Variables representing the same construct were scrutinized for correlations above .80. For example, six variables were available from IPEDS, each representing aspects of standardized admissions testing, all highly correlated, above 0.90. To avoid errors associated with collinearity, the variable with the strongest correlation to the remaining five was retained while the other four were eliminated. Descriptive statistics of remaining organizational and cultural outcomes variables, including range, mean, and standard deviation, are provided in Table 8 and Table 9, respectively. The final dataset used in cluster analysis contained 527 cases and 19 variables.

Table 4

*HSI Cluster Solution and Differences Between Public Data*

| Name | Abbrev. | *N* | Public Data, Descriptive | | | Public Data, Analyzed | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % Public | % Highest Acc. Region | % HACU Mbrs. | # Years HSI | % Hisp. Ugr. | % Hisp. Grd. | % Hisp. Staff | % Hisp. County | Avg. Annual Net Price |
| Majority Hispanic | UMAJ | 55 | 50 | 38, WASC/ACCJC | 65 | 20.25 | 0.52 | 0.48 | 0.30 | 0.49 | 12,147 |
| Minority Hispanic | UMIN | 103 | 44 | 33, WASC/ACCJC | 52 | 4.42 | 0.32 | 0.46 | 0.13 | 0.30 | 15,203 |
| Puerto Rico | UPR | 39 | 33 | 90, MSCHE | 64 | 20.87 | 0.98 | 0.37 | 0.95 | 0.99 | 6,321 |
| Starting HSI Low Graduation | CCSTA | 99 | 100 | 41, WASC/ACCJC | 40 | 6.3 | 0.33 | 0.23 | 0.12 | 0.28 | 5,523 |
| Enduring HSI Low Graduation | CCEND | 101 | 99 | 57, WASC/ACCJC | 35 | 20 | 0.56 | 0.22 | 0.27 | 0.47 | 5,907 |
| Midpoint HSI High Graduation | CCMID | 19 | 32 | 63, SACS | 32 | 10.4 | 0.56 | 0.63 | 0.43 | 0.56 | 13,328 |

*Note.* Abbrev. = cluster abbreviation. Sector included in abbreviation (U = four-year institutions, CC = two-year institutions). Public = % institutions in each cluster publicly controlled and not religiously affiliated. % Highest Acc. Region = % of accreditation region composition, naming the highest cluster. % HACU Mbrs. = % of institutions in the cluster that identify as HACU members in 2018. # Years HSI = average number of years institutions designated as HSI; does not indicate continuous designation. % Hisp. Urg. = average percent of Hispanic undergraduate students in cluster. % Hisp. Grd.. = average percent of Hispanic student graduation rate in cluster. % Hisp. Staff = average percent of Hispanic staff in cluster. % Hisp. County = average percent of Hispanic residents in county where institution is located. Avg. Annual Net Price = average annual net price for families with incomes under $30,000.

Table 5

*HSI Cluster Solution and Differences Between Publicly Unavailable Data*

| | | | NSSE/CCSSE | | | | | | Website Review | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Abbrev. | N | HO | DD | ACH | SFI | SLR | | Curricular/Co-Curricular | Student Support | Adv. | Prof. Dev. | Inst. |
| Majority Hispanic | UMAJ | 55 | - | + + | | | | | + + | + + | NA | + + | + |
| Minority Hispanic | UMIN | 103 | | + + | | | | | + + | + + | NA | + | + |
| Puerto Rico | UPR | 39 | + | - - | | | | | + + | + | NA | + | - |
| Starting HSI Low Graduation | CCSTA | 99 | | | + + | - - | - / + + | | + | ++ | NA | + | + |
| Enduring HSI Low Graduation | CCEND | 101 | | | | - | + / + + | | - | + | NA | - | + |
| Midpoint HSI High Graduation | CCMID | 19 | | | - - | - - | - - / - - | | - | - | NA | - | - |

*Note.* Abbrev. = Abbreviation. HO = Higher-Order Learning. DD = Discussions with Diverse Others. ACH = Academic Challenge. SFI = Student Faculty Interaction. SLR = Support for Learners. Adv. = Advising. Prof. Dev. = Professional Development. Inst. = Institutional. + = cluster was significantly higher ($p < 0.05$ for scaled items). + + = cluster was significantly higher ($p < 0.001$ for scaled items). - = cluster was significantly lower ($p < 0.05$ for scaled items). - - = cluster was significantly lower ($p < 0.001$ for scaled items). / = significant differences between more than one other cluster. NA = information unavailable from website review.

Table 6

*Frequency of Institutional Cases by Carnegie Classification, Control, and Accreditation Region*

| | | HLC | MSCE | NEASC | NWCCU | SACS | WASC/ACCJC | Total |
|---|---|---|---|---|---|---|---|---|
| Two-Year | Private | 1 | 1 | 1 | 1 | 11 | 4 | 19 |
| | Public | 47 | 22 | 8 | 10 | 52 | 103 | 242 |
| Four-Year | Private | 20 | 62 | 1 | 5 | 33 | 37 | 158 |
| | Public | 17 | 32 | 1 | 2 | 29 | 27 | 108 |
| Total | | 85 | 117 | 11 | 18 | 125 | 171 | 527 |

*Note.* HLC = Higher Learning Commission, MSCE = Middle States Commission on Higher Education, NEASC = New England Association of Schools and Colleges, NWCCU = Northwest Commission on Colleges and Universities, SACS = Southern Association of Colleges and Schools, WASC/ACCJC = Western Association of Schools and Colleges/Accrediting Commission for Community and Junior Colleges.

Table 7

*Frequency of Institutional Cases by Carnegie Classification, Control, and HACU Membership*

| | | No | Yes | Total |
|---|---|---|---|---|
| Two-Year | Private | 8 | 11 | 19 |
| | Public | 145 | 97 | 242 |
| Four-Year | Private | 86 | 72 | 158 |
| | Public | 27 | 81 | 108 |
| Total | | 266 | 261 | 527 |

Table 8

*Organizational Outcome Variables Remaining after Assumptions Testing by Predictor Importance*

| | PI | Min. | Max. | *M* | *SD* |
|---|---|---|---|---|---|
| Percent Undergraduates, Hispanic | 1.0 | 0.24 | 1 | 0.46 | 0.21 |
| Percent Undergraduates, Pell | 0.86 | 16 | 100 | 55.88 | 17.32 |
| Per Credit-Hour Tuition, In-District | 0.82 | 25 | 1905 | 329.55 | 387.90 |
| Percent Transfer Students, Hispanic | 0.71 | 0.04 | 1 | 0.40 | 0.22 |
| Percent Undergraduates, Part-Time | 0.60 | 0.01 | 0.87 | 0.46 | 0.26 |
| Graduate Rate, Hispanic Student, Any Award | 0.36 | 0 | 88 | 32.17 | 16.52 |
| Percent of Budget, Instructional Expenses | 0.20 | 16 | 66 | 41.97 | 8.94 |
| Full-time Student Retention Rate | 0.14 | 0 | 100 | 63.76 | 20.60 |
| Percent of Revenue, Tuition | 0.12 | 2 | 100 | 36.92 | 31.81 |
| Percent of Part-time Undergraduate Enrollment | 0.09 | 2 | 51804 | 5840.70 | 7325.27 |
| Percent of Degrees Awarded in STEM | 0.08 | 0 | 0.84 | 0.10 | 0.10 |

*Note.* PI = Predictor Importance.

Table 9

*Cultural Outcome Variables Remaining after Assumptions Testing, Organized by Predictor Importance*

| | PI | Min. | Max. | *M* | *SD* |
|---|---|---|---|---|---|
| Number Years as HSI | 0.60 | 1 | 24 | 12.69 | 8.93 |
| Percent of County, Hispanic | 0.58 | 11 | 100 | 41.63 | 21.99 |
| Percent of Staff, Hispanic | 0.57 | 0 | 100 | 0.25 | 0.24 |
| Average Net Price, Family Income under $30K | 0.50 | 253 | 33833 | 9512.93 | 6788.47 |
| Median County Earnings, Degree Holders | 0.32 | 33610 | 117292 | 71154.84 | 15373.48 |

(Table 9 continued)

| | | | | | |
|---|---|---|---|---|---|
| Median Earnings, Six Years after Departure | 0.22 | 12400 | 54300 | 28966.22 | 7071.87 |
| Median Debt, Graduating Students | 0.19 | 1500 | 34500 | 13729.70 | 7921.61 |
| Ever lost HSI Status | - | 0 | 1 | 0.09 | 0.29 |

*Note.* PI = Predictor Importance. - = variable did not cluster.

**Research Question One: HSI Cluster Solution**

The first research question investigated the following: What homogeneous clusters of Hispanic-Serving Institutions emerge based on organizational and cultural outcome variables? The null hypothesis, that there were no distinct clusters, was rejected. Four distinct initial clusters captured 51% of institutions, but the clusters were surprisingly swamped by Carnegie Classification. Separating the files by institutional sector, a sub-cluster analysis revealed three distinct four-year clusters: Majority Hispanic, Minority Hispanic, and Puerto Rico which accounted for 74% of four-year institutions. In addition, three distinct two-year clusters were revealed: Starting HSI Low Graduation, Enduring HSI Low Graduation, and Midpoint HSI High Graduation, which accounted for 97% of two-year institutions.

**Initial Clusters.** Using the automatic TwoStep clustering procedure to analyze the entire dataset, SPSS segmented the sample ($n$ = 527) into three clusters, with a silhouette measure of cohesion and separation of 0.4, which is considered fair (Norušis, 2012). Among the 21 inputs, nine met the 0.50 or higher score for predictor importance which was set specifically for this study to cull only the most predictive inputs. Three clusters included 269 institutions and excluded 231 institutions. TwoStep cluster analysis does not require the inclusion of all cases, thus 27 cases were excluded from the cluster solution as noise (IBM Corp., n.d.-b).

Additional analysis was conducted to identify the fewest number of variables that encapsulate the greatest number of institutions with the highest silhouette measure of cohesion and separation score. A TwoStep cluster analysis of all institutional cases was conducted, only using variables that were moderate to strong predictors of importance in the initial cluster. To further narrow select variables, those most closely tied to the research question were retained, achieving a balance of analysis between organizational and cultural components.

Six variables were identified as strong predictors of clustering and associated with the study research questions. The following six variables were included in analysis: percentage of undergraduate Hispanic students, percentage of Hispanic-student graduation with any award, percentage of Hispanic staff, annual net price, number of years with HSI designation, and percentage of Hispanic residents in the county of the institution.

Following TwoStep cluster procedure on the 527 cases, six inputs resulted in four clusters, including 416 of 527 cases, with a silhouette score of 0.5, which is considered good (Norušis, 2012). The Majority Hispanic cluster ($n$ = 119) was characterized with high Hispanic student, county populations, and long term HSI designations. The Puerto Rico cluster ($n$ = 46) was characterized by Puerto Rican institutions with high Hispanic student, county, and staff populations, as well as long term HSI designations. The Minority Hispanic U cluster ($n$ = 110) was differentiated by low Hispanic populations, high percentages of Hispanic graduations, and high annual net price. The Minority Hispanic CC cluster ($n$ = 141) was characterized by low Hispanic populations, low percentages of Hispanic graduations, and low annual net price.

This stage of analysis provided early indicators that TwoStep cluster analysis was a viable methodology to parse out differences in the HSI body. Although the resulting clusters were substantial enough in distance for the mathematical solution to clustering (Norušis, 2012),

the composition of each cluster relied heavily on Carnegie Classification. Thus, the clusters were less meaningful in a practical sense to address the research question, parsing out heterogeneity among HSIs. Table 10 provides a summary of variable predictor importance and variable means for each cluster in the initial phase of cluster analysis.

Table 10

*TwoStep Cluster Analysis, Entire Case Set, Most Predictive Variables*

| | | Cluster Description | | | |
|---|---|---|---|---|---|
| | PI | Majority Hispanic *n* = 119, 67% 2-year *M* | Puerto Rico *n* = 46, 87% 4-year *M* | Minority Hispanic U *n* = 110, 89% 4-year *M* | Minority Hispanic CC *n* = 141, 86% 2-year *M* |
| Hispanic Staff | 1.00 | 0.30 | 0.94 | 0.15 | 0.14 |
| Hispanic Undergraduate | 0.91 | 0.58 | 0.97 | 0.34 | 0.36 |
| Years as HSI | 0.70 | 22.26 | 20.48 | 5.81 | 7.09 |
| County Hispanic | 0.68 | 0.48 | 0.96 | 0.33 | 0.31 |
| Average Annual Net Price | 0.32 | 7,651 | 6,240 | 16,978 | 5,759 |
| Hispanic Graduation | 0.22 | 0.31 | 0.39 | 0.52 | 0.24 |

*Note.* PI = Predictor Importance.

**Sub-Clusters.** Continued observation of the severe separation of clusters based on institutional level, led to the division of the dataset. Two- and four-year institutions were saved as separate data files, imported to SPSS, and analyzed using the same TwoStep cluster analysis procedure and six predictive variables. Clusters were named by variables of predictor importance.

Detailed in Table 11, the four-year dataset clustered 197 cases and excluded 69 cases as noise (Norušis, 2012). The three-cluster solution had a good silhouette measure of 0.6 meaning the clusters were a good distance apart which increases the confidence in the validity of the solution. The Majority Hispanic (UMAJ) cluster ($n$ = 55) was characterized with moderate Hispanic student, staff, and county populations, and long-term HSI designations. The Minority Hispanic (UMIN) ($n$ = 103) was characterized by low Hispanic student, staff, and county populations and short-term HSI designations. The Puerto Rico (UPR) cluster ($n$ = 39) was differentiated by high Hispanic students, staff, and county populations and long-term HSI designations.

Table 11

*TwoStep Cluster Analysis, Four-Year Case Set, Most Predictive Variables*

| | | Cluster Descriptions | | |
|---|---|---|---|---|
| | | Majority Hispanic (UMAJ) $n$ = 55 | Minority Hispanic (UMIN) $n$ = 103 | Puerto Rico (UPR) $n$ = 39 |
| | PI | *M* | *M* | *M* |
| Hispanic Undergraduate | 1.00 | 0.52 | 0.32 | 0.98 |
| Hispanic Staff | 0.95 | 0.30 | 0.13 | 0.95 |
| County Hispanic | 0.91 | 0.49 | 0.30 | 0.99 |
| Years as HSI | 0.71 | 20.25 | 4.42 | 20.87 |
| Average Annual Net Price | 0.10 | 12,147 | 15,203 | 6,321 |
| Hispanic Graduation | 0.02 | 0.48 | 0.46 | 0.37 |

*Note.* PI = Predictor Importance.

The two-year dataset consisted of 261 cases. TwoStep cluster analysis produced a three-cluster solution, including 254 institutions with a good silhouette measure of cohesion and separation of 0.6. This silhouette measure of cohesion was one indicator of validity for this cluster solution. The Starting HSI Low Graduation (CCSTA) cluster ($n$ = 99) was characterized by low percentages of Hispanic populations, short-term HSI designation status, and low Hispanic graduation rates. The Enduring HSI Low Graduation (CCEND) cluster ($n$ = 103) was characterized by moderate Hispanic populations, long-term HSI designation status, and low Hispanic graduation rates. Finally, the Midpoint HSI High Graduation (CCMID) cluster ($n$ = 19) was characterized by high Hispanic populations, middle-term HSI designation status, and high Hispanic graduation rates. See Table 12 for variable predictor importance and variable means for each cluster.

Table 12

*TwoStep Cluster Analysis, Two-Year Case Set, Most Predictive Variables*

| | | Cluster Description | | |
|---|---|---|---|---|
| | | Starting HSI Low Graduation $n$ = 99 | Enduring HSI Low Graduation $n$ = 101 | Midpoint HSI High Graduation $n$ = 19 |
| | PI | *M* | *M* | *M* |
| # Years as HSI | 1.0 | 6.3 | 20 | 10.4 |
| % Hispanic Graduation | 0.72 | 0.23 | 0.22 | 0.63 |
| % Hispanic Undergraduate | 0.59 | 0.33 | 0.56 | 0.56 |
| % County Hispanic | 0.49 | 0.28 | 0.47 | 0.56 |
| % Hispanic Staff | 0.45 | 0.12 | 0.27 | 0.43 |
| Average Annual Net Price | 0.36 | 5,523 | 5,907 | 13,328 |

*Note.* PI = Predictor Importance.

In summary, the investigation of research question one revealed four distinct clusters, swamped by Carnegie Classification. Conducting sub-cluster analysis resulted in a good three cluster solution for four-year institutions primarily differentiated by size of Hispanic student, staff, and county populations. The results of the two-year cases revealed three distinct clusters, of good distance, and differentiated by longevity as a HSI and graduation of Hispanic students.

**Research Question Two: Significant Cultural Differences**

The second research question investigated the following: To what extent does cluster assignment differ by cultural outcome variables? Publicly available data were utilized to quantitatively explore the relationship between organizational and cultural outcome data to best conceptualize differences among HSIs to answer research question one. Cultural outcome data beyond demographics were not publicly available, thus, to answer research question two, campus-level cultural factors assessing student experiences were analyzed with a Multivariate Analysis of Variance (MANOVA) to detect variance.

Cluster assignment explained a sizeable 17% of the variance in cultural outcome variables among both the four-year and the two-year sub-clusters to small effect ($\eta^2 = 0.17$). Thus, the null hypothesis was rejected. Significant differences in Higher Order Learning and Discussions with Diverse Others were present between four-year clusters ($p < 0.05$). In addition, Academic Challenge, Student Faculty Interaction, and Support for Learners demonstrated significant differences between two-year clusters ($p < 0.05$).

**Four-year sub clusters.** National Survey of Student Engagement (NSSE) data were contracted through Indiana University and deidentified before use. Institutions optionally administer this nationally recognized instrument to collect campus-level cultural data. NSSE data less than five years old were available for freshman and seniors from 139 of the 266 four-year

institutions in the dataset. Aggregate institutional scores for freshman and seniors on 10 constructs were averaged to create one score per variable per institution. See Table 13 of the descriptive statistics and correlations.

Prior to conducting a MANOVA to explore the effect of cluster membership on NSSE score, Pearson correlations were performed between all dependent variables. A meaningful pattern of correlations ware observed within moderate range, affirming the appropriateness of a MANOVA. However, the Box's *M* test of covariance assumption value was interpreted as significant ($p < 0.001$) which violates the covariance of matrices assumption. Ultimately, the cluster group sizes exceeded 30 and were robust against violations of homogeneity of covariance matrices assumption (Allen & Bennett, 2008). Few corresponding covariances were greater than three times satisfying MANOVA procedures after the violation (Tinsley & Brown, 2000).

Testing the hypothesis that cultural data would further distinguish between groupings of HSIs, a statistically significant MANOVA effect was obtained, Pillai's Trace = 0.52, $F(3, 135) = 2.70$, $p < 0.001$. The small effect size was estimated at 0.174. Thus, 17% of the variance in the canonically derived dependent variable was accounted for by cluster assignment. Table 14 displays the one-way Analysis of Variance (ANOVA) results. Post hoc comparisons using Fisher's least significant difference (LSD) test indicated that there were significant differences between clusters on some cultural outcome variables (see Table 15).

In Higher Order Learning, UMAJ cluster had a significantly lower mean than cluster UPR ($MD = -0.001$, $p = 0.003$). UPR had a significantly higher mean than institutions that were not assigned to a cluster ($MD = 0.02$, $p < 0.001$). In Discussions with Diverse Others, cluster UPR had a significantly lower mean score than cluster UMAJ ($MD = -2.74$, $p = 0.001$) and UMIN ($MD = -2.17$, $p = 0.003$).

Table 13

*Correlated NSSE Variables, Descriptive Statistics*

| Variable | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Higher-Order Learning | 1.00 | | | | | | | | | | 40.41 | 1.92 |
| 2. Reflective & Integrative Learning | 0.65** | 1.00 | | | | | | | | | 37.67 | 1.91 |
| 3. Learning Strategies | 0.51** | 0.26** | 1.00 | | | | | | | | 28.25 | 2.19 |
| 4. Quantitative Reasoning | 0.70** | 0.22** | 0.27** | 1.00 | | | | | | | 39.68 | 2.22 |
| 5. Collaborative Learning | 0.20* | 0.29** | 0.43** | 0.019* | 1.00 | | | | | | 32.83 | 2.90 |
| 6. Discussions with Diverse Others | 0.39** | 0.39** | 0.39** | 0.23** | 0.18* | 1.00 | | | | | 41.64 | 2.67 |
| 7. Student-Faculty Interaction | 0.26** | .29** | 0.31** | 0.09 | 0.57** | 0.21* | 1.00 | | | | 22.77 | 3.08 |
| 8. Effective Teaching Practices | 0.64** | 0.47** | 0.21* | 0.63** | -0.08 | 0.16 | 0.29** | 1.00 | | | 40.38 | 2.13 |
| 9. Quality of Interactions | 0.20* | 0.25** | 0.09 | 0.19* | 0.07 | 0.03 | 0.36** | 0.50** | 1.00 | | 41.42 | 2.62 |
| 10. Supportive Environment | 0.46** | 0.38** | .39** | 0.25** | 0.41** | 0.32** | 0.49** | 0.48** | 0.37** | 1.00 | 34.88 | 2.59 |

*Note.* $n = 139$.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 14

*One-way ANOVA with NSSE Scales and Cluster Assignment, Ordered by Effect Size*

| | Levene's | | ANOVAs | | |
|---|---|---|---|---|---|
| | $F(3, 135)$ | $p$ | $F(3, 135)$ | $p$ | $\eta^2$ |
| Higher-Order Learning | 1.12 | .0343 | 3.97 | 0.010* | 0.08 |
| Discussions with Diverse Others | 11.07 | < 0.001 | 3.91 | 0.010* | 0.08 |
| Quality of Interactions | 0.62 | 0.606 | 2.40 | 0.071 | 0.05 |
| Reflective & Integrative Learning | 0.24 | 0.871 | 1.52 | 0.210 | 0.03 |
| Quantitative Reasoning | 0.20 | 0.895 | 1.41 | 0.242 | 0.03 |
| Collaborative Learning | 0.79 | 0.500 | 0.92 | 0.434 | 0.02 |
| Supportive Environment | 2.78 | 0.044 | 0.83 | 0.478 | 0.02 |
| Effective Teaching Practices | 3.10 | 0.029 | 0.82 | 0.486 | 0.02 |
| Student-Faculty Interaction | 1.20 | 0.311 | 0.35 | 0.788 | 0.01 |
| Learning Strategies | 1.07 | 0.364 | 0.25 | 0.858 | 0.01 |

*Note.* $N = 139$.

* = significant at the 0.05 level.

Table 15

*LSD Post Hoc for Significant ANOVAs*

| | (I) | (J) | Mean Difference (I-J) | *SE* | *p* |
|---|---|---|---|---|---|
| Higher Order Learning | UMAJ | UMIN | -0.58 | 0.36 | 0.112 |
| | | UPR | -1.80 | 0.60 | 0.003* |
| | | Unclustered | 0.38 | 0.53 | 0.476 |
| | UMIN | UMAJ | 0.58 | 0.36 | 0.112 |
| | | UPR | -1.22 | 0.63 | 0.054 |
| | | Unclustered | 0.95 | 0.56 | 0.089 |
| | UPR | UMAJ | 1.80 | 0.60 | 0.003 |
| | | UMIN | 1.22 | 0.63 | 0.054 |
| | | Unclustered | 2.17 | 0.74 | 0.004* |
| | Unclustered | UMAJ | -0.38 | 0.53 | 0.476 |
| | | UMIN | -0.95 | 0.56 | 0.089 |
| | | UPR | -2.17 | 0.74 | 0.004* |
| Discussion with Diverse Others | UMAJ | UMIN | 0.06 | 0.50 | 0.910 |
| | | UPR | 2.74 | 0.84 | 0.001** |
| | | Unclustered | 0.83 | 0.74 | 0.262 |
| | UMIN | UMAJ | -0.06 | 0.50 | 0.910 |
| | | UPR | 2.68 | 0.87 | 0.003* |
| | | Unclustered | 0.77 | 0.78 | 0.321 |
| | UPR | UMAJ | -2.74 | 0.84 | 0.001** |
| | | UMIN | -2.68 | 0.87 | 0.003* |
| | | Unclustered | -1.91 | 1.03 | 0.065 |
| | Unclustered | UMAJ | -0.83 | 0.74 | 0.262 |
| | | UMIN | -0.77 | 0.78 | 0.321 |
| | | UPR | 1.91 | 1.03 | 0.065 |

*Note. N* = 139.

* = significant at the 0.05 level.

** = significant at the 0.01 level.

Four eigenvalues and canonical correlations were extracted by the MANOVA. The first eigenvalue was 0.53 and accounted for an immense 73% of the model variance. The canonical correlation was 0.59 which implies that 35% of the variance in the derived scores were accounted for by cluster assignment. By contrast, the second eigenvalue was equal to 0.15, accounted for 20% of the model variance, and had a canonical correlation of 0.36 which was not statistically significant (Wilks $\Lambda = 0.83$, $F[18, 254] = 1.39$, $p = 0.136$).

The standardized discriminant function coefficients suggested that four clusters were maximally differentiated by canonical weightings from Higher-Order Learning (1.92), Learning Strategies (0.89), Discussions with Diverse Others (0.79), and Reflective and Integrative Learning (0.63). The correlations between cluster assignment and canonical variables range from 0.01 to 0.39. In essence, Higher-Order Learning, Learning Strategies, Discussions with Diverse Others, and Reflective and Integrative Learning are the most influential cultural variables among the 10 NSSE variables with respect to maximally differentiating cluster assignment.

To estimate the cluster centroids, the NSSE subscale raw scores were multiplied by the corresponding unstandardized discriminant function coefficients and then summed across all cases. Cluster UMAJ was associated with the largest group centroid ($M = 3.33$, $SD = 0.96$), cluster UMIN was the next largest group centroid ($M = 2.79$, $SD = 0.99$), and cluster UPR was the smallest group centroid ($M = 0.64$, $SD = 1.22$). Table 16 displays the MANOVA summary.

Table 16

*Discriminant Function Coefficients Associated with the MANOVA*

| | Unstandardized | Standardized | Structure |
|---|---|---|---|
| Higher-Order Learning | -1.03 | -1.92 | -0.39 |
| Reflective & Integrative Learning | 0.32 | 0.63 | 0.01 |
| Learning Strategies | 0.40 | 0.03 | -0.16 |
| Quantitative Reasoning | 0.01 | 0.89 | -0.05 |
| Collaborative Learning | 0.02 | 0.05 | -0.07 |
| Discussions with Diverse Others | 0.30 | 0.79 | 0.36 |
| Student-Faculty Interaction | 0.03 | 0.08 | 0.11 |
| Effective Teaching Practices | -0.01 | -0.03 | -0.13 |
| Quality of Interactions | 0.06 | 0.15 | 0.09 |
| Supportive Environment | 0.02 | 0.05 | -0.03 |

*Note.* $N = 139$

An ANOVA was performed on the canonically derived variable. The alpha level of a conservative 0.001 was specified to carefully approach the significance given the known differences in derived data and univariate data (Neufeld & Gardner, 1990). An ANOVA of the three-leveled independent variable was performed on the canonically derived cultural dependent variable, yielding $F(3, 135) = 23.68$, $p < 0.001$, $\eta^2 = 0.35$. Affirmatively, the effect size value corresponds with the canonical correlation effect size (35%).

**Two-year sub clusters.** Community College Survey of Student Engagement (CCSSE) data were contracted through University of Texas at Austin and deidentified before use. Similar to NSSE, the CCSSE is administered at the discretion of the institutions. Of the 261 two-year institutions in the dataset, CCSSE data within the previous 5 years were available for 156 institutions. Because CCSSE surveys are conducted in courses, oversampling of full-time

students is known to occur (Community College Survey of Student Engagement, 2019). CCSSE provided weight values, however unweighted data were used because no comparisons were made between part-time and full-time students by institution. See Table 17 for the descriptive statistics and correlations of CCSSE variables.

Prior to conducting a MANOVA operation to explore the effect of cluster membership on CCSSE score, dependent variables were examined with Pearson correlations. A pattern of correlations was observed within moderate range, suggesting the appropriateness of a MANOVA. Further, Box's *M* value was interpreted as non-significant ($p = 0.171$), passing the covariance of matrices assumption.

Table 17

*Correlated CCSSE Variables, Descriptive Statistics*

| Variable | 1. | 2. | 3. | 4. | 5. | *M* | *SD* |
|---|---|---|---|---|---|---|---|
| 1. Active and Collaborative Learning | 1.0 | | | | | 0.40 | 0.03 |
| 2. Student Effort | 0.54** | 1.0 | | | | 0.47 | 0.02 |
| 3. Academic Challenge | 0.52** | 0.53** | 1.0 | | | 0.61 | 0.02 |
| 4. Student and Faculty Interactions | 0.59** | 0.37** | 0.45** | 1.0 | | 0.45 | 0.03 |
| 5. Support for Learners | 0.58** | 0.52** | 0.40** | 0.49** | 1.0 | 0.49 | 0.03 |

*Note.* $N = 139$

**. Correlation is significant at the 0.01 level (2-=tailed).

Testing the hypothesis that cultural data would further distinguish between groupings of HSIs, a statistically significant MANOVA effect was obtained, Pillai's Trace = 0.65, $F(3, 152) = 8.32$, $p < 0.001$. Partial eta squared was estimated at 0.17 which is a small effect size. Thus, 17%

of the variance in the canonically derived dependent variable was accounted for by cluster assignment. Table 18 displays the one-way ANOVA results.

Table 18

*One-way ANOVAs with CCSSE Scales and Cluster Assignment, Ordered by Effect Size*

| | Levene's | | ANOVAs | | |
|---|---|---|---|---|---|
| | $F(3,152)$ | $p$ | $F(3,152)$ | $p$ | $\eta^2$ |
| Active and Collaborative Learning | 2.75 | .045 | 10.33 | < 0.001** | .17 |
| Support for Learners | 1.21 | .307 | 10.55 | < 0.001** | .17 |
| Student Effort | 2.02 | .045 | 7.96 | < 0.001** | .14 |
| Academic Challenge | 2.17 | .094 | 6.21 | .001** | .11 |
| Student and Faculty Interactions | 2.29 | .081 | 5.94 | .001** | .11 |

*Note.* $N = 156$.

** significant at $p = 0.001$.

Post hoc comparisons using Fisher's least significant difference (LSD) test indicated that there were significant differences between clusters on some cultural outcome variables (Table 19). In Academic Challenge, the CCSTA cluster had a significantly higher mean than cluster CCMID ($MD$ =0 .01, $p = 0.001$) and unclustered institutions ($MD = 0.02$, $p < 0.001$).

The CCSTA cluster had significantly lower mean than institutions that were not assigned to a cluster for Student Faculty Interactions ($MD = -0.02$, $p = 0.001$). Likewise, CCEND cluster (MD = -0.04, p = 0.033) and CCMID cluster (MD = -0.03, p < 0.001) had lower means than unclustered institutions in Student Faculty Interactions.

Finally, CCEND had significantly higher means than all other clusters in Support for Learners: CCSTA ($MD = 0.05$, $p = 0.009$), CCMID ($MD = 0.07$, $p < 0.001$), and unclustered

institutions (*MD* = 0.06, *p* = 0.003). The CCSTA cluster had means significantly higher than the CCMID cluster (*MD* = 0.02, *p* < 0.001) for Support for Learners.

Table 19

*LSD Post Hoc of Significant ANOVAs*

| | (I) | (J) | Mean Difference (I-J) | SE | *p* |
|---|---|---|---|---|---|
| Academic Challenge | CCSTA | CCEND | -0.001 | 0.01 | 0.894 |
| | | CCMID | 0.01 | 0.002 | 0.001** |
| | | Unclustered | 0.02 | 0.004 | < 0.000** |
| | CCEND | CCSTA | 0.001 | 0.01 | 0.894 |
| | | CCMID | 0.01 | 0.001 | 0.274 |
| | | Unclustered | 0.02 | 0.01 | 0.096 |
| | CCMID | CCSTA | -0.01 | 0.003 | 0.001** |
| | | CCEND | -0.01 | 0.001 | 0.271 |
| | | Unclustered | 0.006 | 0.004 | 0.120 |
| | Unclustered | CCSTA | -0.02 | 0.004 | < 0.000** |
| | | CCEND | -0.02 | 0.01 | 0.096 |
| | | CCMID | -.0007 | 0.004 | 0.120 |
| Student and Faculty Interactions | CCSTA | CCEND | 0.01 | 0.02 | 0.441 |
| | | CCMID | 0.004 | 0.005 | 0.412 |
| | | Unclustered | -0.02 | 0.007 | 0.001** |
| | CCEND | CCSTA | -0.01 | 0.02 | 0.596 |
| | | CCMID | -0.009 | 0.02 | 0.596 |
| | | Unclustered | -0.04 | 0.02 | 0.033* |
| | CCMID | CCSTA | -0.004 | 0.005 | 0.412 |
| | | CCEND | 0.009 | 0.02 | 0.596 |
| | | Unclustered | -0.03 | 0.007 | < 0.000** |
| | Unclustered | CCSTA | 0.02 | 0.007 | 0.001** |
| | | CCEND | 0.04 | 0.02 | 0.033* |
| | | CCMID | 0.03 | 0.007 | < 0.000** |

(Table 19 continued)

| | | | | | |
|---|---|---|---|---|---|
| Support for Learners | CCSTA | CCEND | -0.05 | 0.02 | 0.009* |
| | | CCMID | 0.02 | 0.005 | < 0.000** |
| | | Unclustered | 0.01 | 0.008 | 0.211 |
| | CCEND | CCSTA | 0.05 | 0.02 | 0.009* |
| | | CCMID | 0.07 | 0.02 | < 0.000** |
| | | Unclustered | 0.06 | 0.02 | 0.003* |
| | CCMID | CCSTA | -0.02 | 0.005 | < 0.000** |
| | | CCEND | -0.1 | 0.02 | < 0.000** |
| | | Unclustered | 0.01 | 0.01 | 0.065 |
| | Unclustered | CCSTA | -0.01 | 0.01 | 0.211 |
| | | CCEND | -0.06 | 0.02 | 0.003* |
| | | CCMID | 0.01 | 0.01 | 0.065 |

*Note.* $N = 156$.

* significant at $p = 0.05$.

** significant at $p = 0.01$.

Four eigenvalues and canonical correlations were extracted by the MANOVA. The first eigenvalue was 0.61 and accounted for 63% of the model variance, a sizable percentage. The canonical correlation was 0.62 which implies that 38% of the variance in the derived scores were accounted for by cluster assignment. The second eigenvalue was equal to 0.33, accounted for 33% of the model variance, and had a canonical correlation of 0.49. Both the first and second eigenvalues were statistically significant ($p < 0.001$). The third eigenvalue was equal to 0.03, accounted for 3.3% of the model variance, and had a canonical correlation of 0.17 which was not statistically significant (Wilks $\Lambda = 0.97$, $F[3, 150] = 1.56$, $p = 0.201$).

The model from the first eigenvalue explained the most variance in cluster assignment accounted for by cultural outcome variables. The standardized discriminant function coefficients from the first model, as shown in Table 20, suggest that three categories were maximally differentiated by canonical weightings: Student and Faculty Interactions (1.14), Academic

Challenge (0.74), and Support for Learners (0.65). The correlations between cluster assignment and canonical variables range from 0.11 to 0.42.

To estimate the cluster centroids, the CCSSE subscale raw scores were multiplied by the corresponding unstandardized discriminant function coefficients and then summed across all cases. Cluster CCEND was associated with the largest group centroid ($M$ = 25.02, $SD$ = 0.16), cluster CCSTA was the next largest group centroid ($M$ = 23.04, $SD$ = 1.04), and the CCMID cluster was the smallest group centroid ($M$ = 22.17, $SD$ = 0.95).

Table 20

*Discriminant Function Coefficients Associated with the MANOVA*

| | Unstandardized | Standardized | Structure |
|---|---|---|---|
| Active and Collaborative Learning | -4.04 | -0.10 | 0.11 |
| Student Effort | 13.20 | 0.31 | 0.40 |
| Academic Challenge | 43.49 | 0.74 | 0.42 |
| Student and Faculty Interactions | -42.13 | -1.14 | -0.30 |
| Support for Learners | 21.24 | 0.65 | 0.37 |

*Note.* $N$ = 154.

A one-way ANOVA was performed on the canonically derived variable. The alpha level of 0.001 was specified to conservatively approach the significance given the known differences in derived data and univariate data (Neufeld & Gardner, 1990). An ANOVA of the three-leveled independent variable was performed on the canonically derived cultural dependent variable, yielding $F(3, 152) = 30.90$, $p < 0.001$, $\eta^2 = 0.38$. Affirmatively, the effect size value corresponds with the canonical correlation effect size (38%).

**Research Question Three: Centralizing Hispanic Students**

The third research question investigated the following: How can institutional websites be used as cultural artifacts to further distinguish between clusters? Despite the usefulness of TwoStep cluster analysis and MANOVA to determine the significant groupings of institutions and the differences between them, there was no adequate measure to determine the extent to which institutions prioritize the experiences of Latino students. To address the research question, a rubric-guided website review of two institutions closest to the centroid of each cluster was conducted. The analysis revealed unique qualitative characteristics which served to illustrate the validity of clusters distinctions, depicted in a composite cluster narrative.

**Majority Hispanic.** UMAJ is a four-year public institution located in a region rich with diverse Hispanic and indigenous heritage where about half of the county population identifies as Hispanic. UMAJ serves more than 20,000 students, and although international and national students attend UMAJ, the school population reflects the community. More than half of UMAJ students are Hispanic, as are nearly 33% of UMAJ staff and faculty. With such a critical mass of Hispanic students, their experiences are vital to UMAJ's thriving community. Programs in Chicana/o, Latin American, and Indigenous studies are offered from the undergraduate to gradate levels. Likewise, a wide variety of courses centralizing the racialized experiences are taught.

Student life is rich with diversity, and more than eight student organizations are places of welcome for Hispanic students. UMAJ recognizes that students are differently equipped to attend and engage in universities studies; thus, student support such as career centers, internships, writing centers, and tutoring centers are offered in multiple modalities and times, including online, drop-in, by appointment, late evenings, and weekends. Further, UMAJ students come from a variety of socioeconomic circumstances, which is why physical health, mental health,

childcare with reduced student rates, and food pantry services are offered. Although UMAJ does not currently offer support for students struggling with housing insecurity, a committee was recently formed to investigate possible institutional responses to this student crisis.

This kind of service to Latino students is by design. The Center for Teaching Excellence offers professional development for faculty to promote inclusive teaching. Faculty and staff regularly receive required training in diversity and inclusion. The institution has a formal policy on diversity and equity, sponsored by the Office for Equity. As an organization, UMAJ embraces bilingualism as evidenced by the website language toggle feature and multiple resources, event invitations, and announcements written in Spanish. UMAJ has been a Hispanic-Serving Institution for 20 years. The evidence is in the daily life of the institution and is not declared on the website beyond occasional news releases or funding announcements.

**Minority Hispanic.** UMIN is a four-year public institution, located in a traditionally suburban, but increasingly urban area. As the community changes, so does UMIN. About 30% of our students identify as Hispanic, and this number has increased dramatically over the decade. UMIN has only been a HSI for 5 years. Although the UMIN Hispanic student population is reflective of the Hispanic county population, the staff and faculty lag with the rate of change.

UMIN demonstrates early sensitivity to the changing needs of the community. Although faculty and staff are not yet required to take diversity training, and the Center for Teaching Excellence does not yet include workshops on culturally relevant pedagogy, the Office of Diversity sponsors a special program for inclusive teaching practices. Diversity is a value publicly recognized on UMIN's homepage, and UMIN recently developed a diversity strategic plan, coordinated by the Office of Diversity.

Hispanic student-focused programs are more mature faculty and staff focused initiatives. UMIN offers a Latino American studies minor, major, and graduate concentration. These programs are supported by a variety of courses centralizing racialized experiences. With more than five Latino student honors societies and organizations, Hispanic-identifying students can find a non-performative space. Academic support at UMIN includes a writing center and tutoring offices by subject, some of which are available in late evenings, but not on weekends. Likewise, UMIN offers a career center which provides information on internships and employment events. UMIN responds to a variety of student needs through the Dean's Office, providing housing, food, physical wellness, mental wellness, and childcare on campus.

**Puerto Rico.** UPR is a large metropolitan four-year public institution on the island of Puerto Rico. The community surrounding UPR *es Boricua*, one of the many diverse Hispanic origin groups. UPR is Hispanic, and more specifically, expressive of Puerto Rican culture. More than 95% of the students, staff, faculty, and community members identify with a category of persons under the umbrella designation of Hispanic.

UPR offers a bachelor's and master's degree in Hispanic Studies. There are at least three student organizations whose purpose is to promote the success of Hispanic students within certain professions, such as engineering and healthcare. Moreover, Hispanic students will rarely find themselves as a minority group in any student organization given the community demographics. Yet this does not indicate an absence of racial or ethnic divides among UPR students, simply that the differences are not detected by the umbrella term *Hispanic*.

Student support is important at UPR. Career services, internships, writing center, tutoring center, physical health, mental health, and support for nursing mothers are all available on campus. Staffing in these support offices vary, and may be available on nights or weekends, on a

case by case basis. UPR recently hosted a conference for HSI leaders and faculty. However, the term “Hispanic-Serving Institution” or “*Institución Hispana de Servicio*” is not on the website.

In the contiguous United States, institutions are preoccupied with structural diversity (Byrd, 2019). By that measure, UPR is not diverse. Thus far, UPR does not have a statement on diversity or faculty and staff training in cultural competencies. However, when it comes to equity in terms of valuing other ways of knowing, respecting heritage other than predominantly White, fostering underserved population scholarship, and leadership, then UPR is doing the work to fully serve Hispanic students.

**Starting HSI Low Graduation.** CCSTA aims to provide students with employable skills and credentials, at an affordable rate, with enough support services. Despite best efforts, and recent attention to underserved populations, the graduation rate at CCSTA for all students, and for Hispanic students specifically, remains below the national average (American Association of Community Colleges, 2018).

Like many other two-year public institutions across the country, CCSTA has services to support students. The Care Team is a multi-office effort to meet essential needs including housing and food insecurity. CCSTA offers childcare subsidies, tutoring support on nights and weekends, and career services. There is also a recently founded student group for Latino Academic Success, and some of the website is available in Spanish.

Approximately one-third of CCSTA’s student population is Hispanic, like the surrounding Hispanic county population. Hispanic staff and faculty, however, are underrepresented. The institution has been a HSI for 6 years. The Diversity Office is responsible for ensuring annual required training, and CCSTA has recently begun an Equity in Teaching

program to foster community while valuing cultural differences. CCSTA has not included HSI status on the website.

**Enduring HSI Low Graduation.** CCEND is confident in its position in the surrounding community. This two-year public institution is in a region with half or majority of county citizens identifying as Hispanic. The CCEND Hispanic student population is slightly higher than the county population, while the staff and faculty population is slightly lower than the Hispanic county population. Overall, student diversity is very important at CCEND as evidenced by the website, publicly available in more than 40 languages, and the inclusion of diversity in the values statement.

The primary mission of CCEND is to provide students with employable credentials at affordable prices. The graduation rate at CCEND is below the national average for all students, and for Hispanic students. Extra activities are sparse, but important. There have been Hispanic Heritage events, but there is no Latino-focused club, association, or honor society, suggesting the culturally specific events are unlikely to be student lead or impactful beyond the celebratory month. Students at CCEND receive academic support through the writing and tutoring center, and late evening hours are available, although weekend hours are not.

With regards to supporting Latino students holistically, there is a food pantry on campus, but it takes effort to find online and on campus. There may be childcare center subsidies, mental health referrals, and a pilot programs to address housing insecurity, but many of these programs are dependent upon recent funding requests. The financial aid and advising offices were only open for regular business hours, except during peak enrollment times.

CCEND has been designated a HSI almost as many years as the term has been used, since 1992. Although explicitly identifying as a HSI was not done on the website, CCEND occasionally calls itself Hispanic-Serving in press releases.

**Midpoint HSI High Graduation**. CCMID plays a unique role in the two-year institution market. CCMID offers a healthcare professions curriculum, only offering certificates and degrees that help students gain employment in medical and medical-support fields. Although CCMID is a public institution, many of its sister schools are private. Similarly, where CCMID focuses on healthcare, other similar schools focus on business management or computer science.

Because CCMID is focused, the graduation rate for all students, and for Hispanic students specifically, is well above the national average. Student, staff, and county Hispanic population percentages are like the demographics at the institution. CCMID offers few support services and no student-led organizations. Although it costs nearly three times as much to complete a degree at CCMID than it costs at other community colleges, nearly 70% of graduates are employed.

CCMID may have an office overseeing diversity issues, a statement on diversity, or training on cultural competency, but that information is not on the public website optimized for student recruitment. The CCMID HSI designation is also not on the website.

## Chapter Summary

Chapter Four described results from the data analysis. In summary, 530 institutional cases and 56 variables were reduced to 527 institutional cases and 21 variables after assumptions testing was conducted.

For the first research question, four clusters of good quality were identified with nine variables contributing to predictor importance, and the null hypothesis was rejected. Observing

the swamping variable of Carnegie Classification on the four clusters, files were separated into two- and four-year institutions. Additional analyses were conducted to identify the fewest number of variables to create meaningful clusters. Three sub-clusters of four-year institutions were identified, differentiated by Hispanic student, staff, and regional population. Three sub-clusters of two-year institutions were identified, differentiated by longevity as a HSI and graduation of Hispanic students.

For the second research question, cultural data obtained through NSSE and CCSSE were attached to each sub-cluster to determine the extent to which cultural data may further distinguish institutional groups. A statistically significant MANOVA was obtained, explaining 17% of the variance in cluster assignment for both the four-year and the two-year cluster assignments. Therefore, the null hypothesis was rejected. The following NSSE variables were found to cause maximal differentiation among four-year clusters: Higher-Order Learning, Learning Strategies, Discussions with Diverse Others, and Reflective and Integrative Learning. The following CCSSE variables were found to cause maximal differentiation among two-year clusters: Student and Faculty Interactions, Academic Challenge, and Support for Learners.

The third research question was addressed by conducting a rubric-guided analysis of the two institutional websites closest to the centroid of its assigned cluster, totaling 12 websites. The analysis resulted in a description of the ways in which Latino student experiences are centralized by each cluster. Themes of curricular, co-curricular, student support, faculty and staff development, and institutional identity were explored.

Chapter Five discusses the results in detail. An outline of the study is provided, and results from Chapter Four are interpreted with respect to literature reviewed in Chapter Two. In Chapter Five, findings are also explicitly linked to Chapter One.

# CHAPTER V

# DISCUSSION

The purpose of this study was to investigate the theoretical typology to understand how Hispanic-Serving Institutions (HSIs) embrace identities of serving Latino students as a policymaking tool. The study drew upon criteria identified in the qualitative literature to conduct a quantitative investigation of both organizational and cultural outcomes. TwoStep cluster analysis and MANOVA methods were used to examine publicly available secondary data and privately held data on campus culture to better understand the typology and application of HSI identities.

The findings supported the hypothesis that HSIs are a heterogeneous group from which homogenous clusters could be derived. The findings also supported the hypothesis that cultural outcome data could further differentiate clusters, a finding which was enhanced through website review. This chapter revisits Garcia's (2017) Typology of Hispanic-Serving Institution Organizational Identities. In a reconsideration of the typology in the policymaking setting, considerations for further development are discussed. Finally, limitations of the study, and recommendations to HSI stakeholders are made. Ultimately, the findings of this study encourage further exploration of the variations among HSIs, and application of servingness to focus Higher Education Act, Title V revisions.

## Garcia's Typology of Hispanic-Serving Institution Organizational Identities Revisited

The findings of this study align with the Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017), as described in Figure 4. The discovery of this alignment, however, was only made possible through additional data collection via methodological website review. Discouragingly, when limiting the analysis to publicly available

data, cultural differences among HSIs and the extent to which an institution centralized the experiences of Hispanic students, could not be determined to adequately address Garcia's (2017) typology.

**Cultural data are relevant.** The TwoStep cluster analysis and MANOVA procedures were used to examine both organizational and cultural outcome data. After data cleaning and assumptions testing, 11 organizational outcome variables and eight cultural outcome variables remained out of 56 initial variables. This suggests that publicly available secondary data is useful for a multidimensional examination of higher education institutions. Where scholars and policymakers have historically privileged organizational outcomes (Garcia, 2019; Lascher, 2018), the findings of this study provide a basis for differentiation in data selection, expanding the scope of what is relevant for measuring service to students.

This study also determined that cultural data helped to further distinguish clusters of HSIs. Scholars have suggested that campus culture impacted student development and success (Cuellar, 2012, 2014; Cuellar & Johnson-Ahorlu, 2016; Gloria, Castellanos, & Orozco, 2005; Gloria, Herrera, & Castellanos, 2016; Gloria & Kurpius, 1996). The methodological approach used in this study extends the frame of campus culture beyond individual student outcomes and broadens it to institutional groupings. There were significant differences in Higher Order Learning and Discussions with Diverse Others in four-year clusters and Higher-Order Learning, Learning Strategies, Discussions with Diverse Others, and Reflective and Integrative Learning were the most influential cultural variables among the 10 NSSE variables with respect to cluster assignment. Among two-year clusters, significant differences in Academic Challenge, Student Faculty Interaction, and Support for Learners, and the same three variables were the most

influential cultural variables among the five CCSSE variables maximally differentiating cluster assignment.

**Website as proxy for identity.** Secondary cultural outcome data were found to be important in cluster identification, and as such, should increase in priority for HSI stakeholders. However, the available secondary data could not specifically address Garcia's (2017) Typology because those data either do not report differences by ethnicity or were not specific to Hispanic student experiences. Advantageously, supplementing the cluster outcomes with a website review of institutions closest to the centroid, the clusters adherence to the model was strengthened. The results of this study provide early indications that, until data which centralize Hispanic students are collected nation-wide, a brief review of institutional websites can provide an impression of the extent to which Hispanic students are served (see Figure 4).

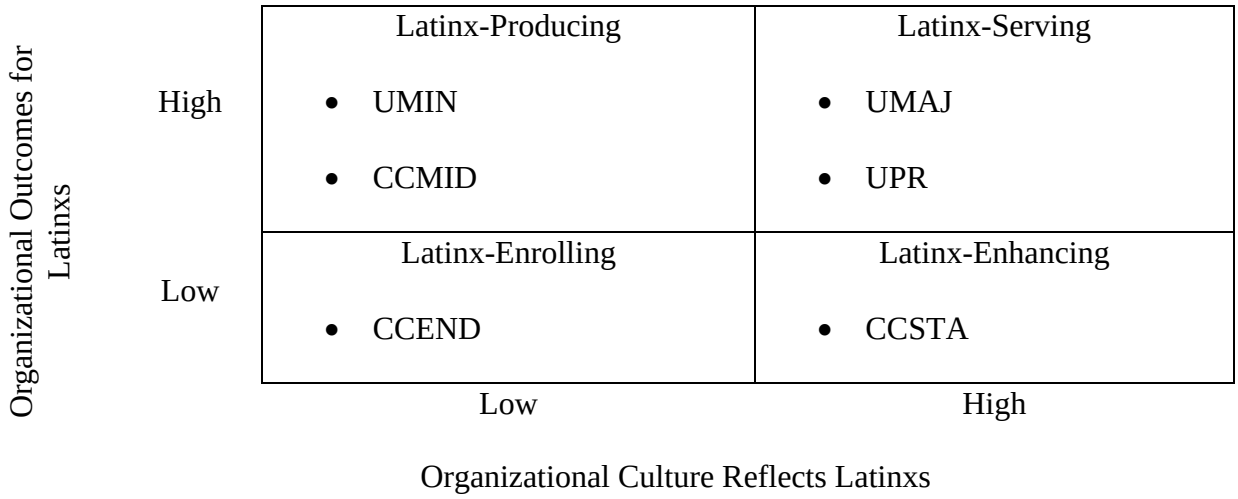


*Figure* 4. Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017) and results of present study.

**CCEND as Latin-Enrolling.** As described by Garcia (2019), Latinx-enrolling institutions are characterized by enrollment per the federal HSI designation but do little beyond meeting the threshold. Institutions in these categories do not produce equitable measurable outcomes for Latinx students, nor do they value the cultural experiences of Latinx students. Although results from the quantitative analysis contradicted results from the website review, this identity type is a fitting description for the Enduring HSI Low Graduation (CCEND) cluster.

The TwoStep cluster analysis suggested CCEND institutions performed lower than the national average of Hispanic student graduation, determining placement of the cluster on the *X* axis. Regarding *Y* axis placement, CCEND outpaced the national average of Hispanic-identifying staff and well exceeded the student population criteria for HSI designation. The MANOVA suggested Support for Learners in this cluster was significantly higher than it was in other clusters. In essence, a quantitative analysis suggested CCEND may fall into the Latinx-enhancing category because of its low organizational outcome performance but high cultural outcome performance.

Surprisingly, the website review contradicted the quantitative analysis. The evidence of Latino students being centralized was absent. The review suggested that only minimal academic and social support could be found at institutions closest to the centroid. The departments which offer support to students were unlikely to be open outside traditional work hours. There was little to no evidence of Latino student life on campus.

There are limitations in the use of this website review approach, as addressed in the limitations section of this chapter. Nonetheless, this study found CCEND institutions may provide support in general but lacked support specifically catering to Latino student needs. At a

minimum, this finding suggests that if support tailored to Latino students was offered, then the institution did not embrace such intentional services as part of its identity.

**CCMID and UMIN as Latinx-Producing.** Latinx-producing meet the minimum designation and produce positive organizational outcomes for Latinx students, but the institution lacks a Latinx focus within a culture of support. One cluster from the two-year sector, Midpoint HSI High Graduation (CCMID), and one cluster from the four-year sector, Minority Hispanic (UMIN), best fit the description for this institutional type. However, because of the differing sectors, the clusters fit the Latinx-producing identity category for distinct reasons. Whereas CCMID showed a firm stance in Latinx-producing identity, UMIN indicated an intentional but gradual shift to serving the changed student population. Thus, this finding affirmed that identities may, but not must, shift with demographic changes.

CCMID is a cluster that is employment focused. Quantitative analysis suggested the cluster exceeds the national average for Hispanic student graduation and outpaces other institutions in achieving a critical mass of Hispanic students and staff. The cluster was significantly higher in Academic Challenge than other clusters. This analysis initially suggested CCMID would be either Latinx-serving or Latinx-producing.

The website review provided no evidence of service to Latino students. The review rounded out the quantitative picture of the cluster which had significantly lower score in Support for Learners. Considering the types of institutions in this cluster, the placement of CCMID into the Latinx-producing type is unsurprising. There was little to no evidence of any student support or Latino culture on campus, and all website content centered on the recruitment theme of quick credentialing for immediate employment. Although the demographics seemed to make CCMID

poised to provide student a true service-focused experience, the mission of these institutions precluded activities beyond credentialing.

A contrasting view of the identity was provided by the UMIN cluster, which seemed to be evolving alongside its student population. Institutions in this cluster have just narrowly met the threshold for designation and only recently gained HSI status. Hispanic students tend to graduate at equitable rates compared to their White counterparts and meet or exceed the national Hispanic student graduation rate. The website review highlighted a rich Latino-centered student life program but revealed that institutional structures such as faculty and staff training, and weekend services were in preliminary stages of development. CCMID seemed near the boundary between the producing and serving identities but had not yet crossed it.

**CCSTA as Latinx-Enhancing**. Garcia (2017) described Latinx-enhancing identities as institutions which do not produce equitable organizational outcomes for Latinx students but seeks ways to normalize Latinx ways of knowing and being. After the TwoStep cluster analysis Starting HSI Low Graduation (CCSTA) was low on the *Y* axis of organizational outcomes given the average graduation rate for Hispanic students. The MANOVA revealed significantly higher means score in the CCSTA cluster compared to other clusters in Academic Challenge, but significantly lower mean scores in Student Faculty Interaction and Support for Learners. Thus, the placement on an *X* axis was more difficult to discern on the secondary data alone.

The website review placed CCSTA into the Latinx-enhancing category because of the unambiguous evidence that Latino student experiences were centralized as part of the institution's regular operation. Embracing bilingualism, providing care to the whole student, supporting faculty in culturally relevant teaching practices, and engaging students in Latinx-

centered groups are all ways CCSTA institutions seemed to prioritize a significant and growing Latino student population.

**UMAJ and UPR as Latinx-Serving**. Finally, Latinx-serving are institutions which meet the HSI designation, produce equitable outcomes for Latinx students, and enhance racial experiences of Latinx students (Garcia, 2019). Similarly, to Latinx-producing institutions, the Majority Hispanic (UMAJ) and the Puerto Rico (UPR) clusters were found to be in this identity category for distinct reasons. Again, placement of two unique clusters into the same identity category affirmed Garcia's (2017, 2019) conceptualization of HSI identities as fluctuating and finding the right fit.

UMAJ fit the Latinx-serving category comfortably. Quantitative results of the TwoStep cluster analysis and MANOVA revealed high graduation rates, high proportions of Hispanic students, faculty, and community members relative to national standards, and significant differences in cultural outcomes. Institutions closest to the centroid of this cluster featured a plethora of Latino-student activities, organizations, and curriculum offerings. Moreover, the institutions demonstrated evidence of a wide availability of services to all students no matter their status by course load or modality, an embrace of bilingualism including event advertisements and forms, and extensive support for faculty and staff seeking to enhance cultural humility in the workplace and in the classroom. It is clear that UMAJ makes an intentional effort to honor Latino student experiences from a holistic point of view.

However, UPR, which is the cluster primarily comprised of institutions in Puerto Rico was categorized as Latinx-serving almost without intentional institutional effort. Based in the quantitative analysis, students graduate at rates near national standards, however there were very few non-Hispanic students to compare with respect to equity or disparity. Likewise, the critical

mass of students, faculty, and community members which is impactful to UMAJ's ability to serve Latino students happens organically for UPR institutions. If UPR institutions had been located as a cluster in the continental United States, the threshold for service to students may not have been met. Yet, by nature of their geographic location, nearly everything UPR institutions provide seems to be by and for Hispanic students. As addressed elsewhere in the discussion of findings, the absence of PWIs may create freedom in serving Latinx students, or the UPR cluster may require a caveat to the scholarly understanding of serving students culturally.

In summary, Garcia's (2017) Typology of Hispanic-Serving Institution Organizational Identities is valuable for conceptualizing institutional identity as conceptualized with organizational and cultural outcomes. Taking the typology a step further than individual institutions, publicly available secondary data were useful in forming clusters among HSIs, and cultural data further distinguished some clusters from others. There is no nation-wide source for cultural data which specifically address Hispanic students. Therefore, a website review served as an adequate, albeit imperfect, substitute for uncollected quantitative data. Although some clusters immediately fit one of the four typologies described in Garcia's (2017) framework, other clusters could not be categorized until characterizations from the website review were employed.

**Garcia's Typology of Hispanic-Serving Institution Organizational Identities Reconsidered**

The findings of this study have highlighted the usefulness of the Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017) as a means of better understanding the differences among HSIs and the extent to which they serve Latino students. Nonetheless, clusters of HSIs could not be aligned to the four organizational identities without additional information. As the typology takes shape within scholarship and policymaking contexts, further considerations may be necessary.

**Ambiguous boundaries.** Organizational identity is constantly shifting. Efforts to make sense of identity must reconcile with the shifting nature of how an institution describes itself and performs publicly and privately (Bolman & Deal, 2017; Manning, 2017). This ambiguity is reflected in the current typology, and when quantified, presents as a challenge to researchers and policymakers.

First, organizational outcome measures were difficult to delineate between the end points of the *Y* axis. For example, admission rate is an organizational outcome which is prioritized in a competitive higher education environment. There is not a standard which defines a good- or poor-quality rate, and that rate is only applicable to institutions that are not open-admission. Without a shared expectation of a quality cutoff, the use of admission rate in the quantitative typology is vague. The same lack of clarity in high- and low-quality values applies to other organizational outcomes, such as yield rate and graduation rate. In this study admission rate did not remain in the cluster analysis after assumptions testing and first elimination by predictor importance. However, if the interpretation of the rate were more meaningful, then the rate may increase in its importance to cluster prediction. In cases where there is not a standard set, researchers and policymakers may revert to a national average. However, what is average is only indicative of current performance, not what is defined as high-quality performance.

Second, cultural outcome measures were similarly subjective along the *X* axis. Some measures were highly dependent upon other factors. For example, including UPR in the scale tilted distribution of Hispanic student, staff, and community percentages. There was no discernable quantitative rule to discriminate when an institutional cluster's score indicated servingness enough to move above the midpoint of the *X* axis.

Third, some measures may inform both the organizational and the cultural outcome axes, but the model is not dimensional enough to accommodate such measures. To illustrate the point, consider cost of attendance. From an organizational outcome perspective, annual net cost should remain affordable, but too low a cost may indicate low quality within the marketplace. From a cultural outcome perspective, net cost speaks to an ethic of care for Hispanic students who are less likely to have accumulated generational wealth or have parents with college education. Questions remain around how measures which overlap both dimensions can be included in a quantitatively-informed typology.

**Factors unconsidered.** The Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017) was created by drawing out the voices of HSI-affiliated participants. The themes which emerged addressed the ways in which institutions personify a serving attitude often through providing aspects of service. The findings of this study present a conundrum for HSI scholars and leaders. Where do service availability and service usage intersect? For example, some features of cultural support were offering childcare services on campus, night, and weekend hours for tutoring centers, and providing access to academic advisors. The model can only consider the presence of these features, not their usefulness, rates of utilization, or history of presence. If an institution, or in the case of this study, a cluster of institutions generally offers night and weekend hours in tutoring centers, but the hours are sparsely attended, can the service threshold be met? If institution leaders reduce night hours because of low utilization, perhaps with an aim to reinvest the resources elsewhere in the student service category, does the plot mark on the service *X* axis move down or up?

The typology also cannot account for the intentionality of an institution through quantitative means alone. The crux of this finding is in the UPR cluster which was identified as

Latinx-serving without evidence of intentional efforts to embody such an identity. The Typology of Hispanic-Serving Institution Organizational Identities (Garcia, 2017) was conceptualized as an identity framework, not necessarily intended within a policymaking context. Where qualitative research captures the essence of experiences and intentions, quantitative research such as this study can only capture reported outcomes. To create a policymaking tool which mirrors the typology reduces too many complicated variables into a score, and dangerously flirts with policymaker interests in ranking, both of which were explicitly and purposefully avoided in the original model.

**Sectors matter.** As a heuristic, the typology is useful to reinforce the importance of both organizational and cultural outcomes with respect to service to Hispanic students. Similarly, the typology adds the element of degree or extent which helps users determine a current state and consider possibilities of a future changed state. However, the typology is limited in its practical use because it currently cannot accommodate important sector differences between community colleges and universities and public and private institutions.

There are organizational outcomes that are relevant in only one sector or another. Again, consider admission rate, which is largely irrelevant in the two-year sector. Similarly, the organizational outcome of graduation rate for all students and for Hispanic students varies widely between community colleges and universities, as well as between public and private institutions. When organizational factors like these are relevant to the quantified typology, having one *Y* axis cut-off rate disadvantages community colleges, but having two cut-off rates within the same model may mislead readers (Garcia, 2019; Rodríguez & Galdeano, 2015; Rodriguez & Kelly, 2014).

Likewise, cultural outcomes for Hispanic students may be unique in community college settings. Engagement in community college student life is known to be different from engagement at universities (Lester, Brown Leonard, & Mathias, 2013; Mellow & Heelan, 2014). It is difficult to interpret the meaning of a binary indicator of presence of Latino student-focused organization as being indicative of centralizing the experiences of Hispanic students or emblematic of a unique way of engaging across institutional sectors. In that same vein, institutions are known to have different governance and funding sources (Excelencia in Education, 2010; Hispanic Association of Colleges and Universities, 2018, 2019). Although institutional funding was not predictive of cluster assignment, it may still be useful to contextualize aspects of service such as fewer diverse course offerings or limited writing center hours.

To summarize, the typology is useful for individual institutions and scholars to explicitly group aspects of an organizational identity for serving Hispanic students. Likewise, the typology is useful to an extent to plot clusters into likely identity categories using both quantitative and qualitative approaches. However, the typology cannot currently account for the differing institutional sectors. Moreover, the potential of the typology for policymaking purposes cannot be fully explored and utilized when valuable data, particularly cultural data, are not clarified and collected.

**Policy Condition of HSIs**

Hispanic-Serving Institutions (HSIs) are defined by the Higher Education Act, Title V, as institutions which enroll 25% or more full-time equivalent Hispanic undergraduate students (U.S. Department of Education, 2018). Although federal policy identifies goals of enrollment, attainment, and institutional quality, only data regarding enrollment are scrutinized by

policymakers. Important organizational outcome data such as parity in graduation are ignored. Likewise, cultural outcome data assessing the ways in which institutions centralize the experiences of Hispanic students is precluded by data collection practices. The result is a policy which treats HSIs monolithically, regardless of their ability to truly serve students.

Nearly half of HSIs are two-year institutions which, by design, have a different purpose and serve a different population than four-year institutions. Similarly, HSIs are a minority-serving institution status and take on a subordinate position within the hierarchy of institutions (Altbach, Gumport, & Berdahl, 2011; Brint & Karabel, 1991; Garcia, 2019; Gasman et al., 2017). This subordination is reflected in rankings, program offerings, faculty recruitment, and federal funding (Fleetwood & Aebersold, 2010; Geiger, 2015; Hispanic Association of Colleges and Universities, 2019; Sharif, 2015).

The findings of this study support two major policy-related changes. First, there is overwhelming evidence that two-year and four-year HSIs are significantly different from one another and should be separately addressed. Second, current data prioritization and collection practices are unquestionably insufficient to affirm an institution's ability to serve Hispanic students.

**Separate treatment of institutions by sector.** The important distinctions between two-year and four-year student experiences and institutional capacities at HSIs has been investigated (Nuñez et al., 2011; Perrakis & Hagedorn, 2010; Torres & Zerquera, 2012). Notably, Nuñez et al. (2016) highlighted community colleges as two of the six unique HSI typologies. Although this study included data which were not considered in the design of Nuñez et al. (2016), the findings are remarkably similar. Two-year institutions were almost always clustered separately from four-year institutions when the dataset included both sectors of institution.

This finding is easily situated within the current understanding of HSIs given the numbers of HSI community colleges and the known differences between the two-year and four-year sectors. Nearly half of all HSIs are two-year institutions and more than half of all Latino students begin their post-secondary education at a community college (Community College Research Center, 2019). Furthermore, the challenges faced by community colleges are unique from the challenges of universities given disparities in funding, student attendance patterns, academic readiness (Altbach et al., 2011; Mellow & Heelan, 2014; Mullin, Baime, & Honeyman, 2015).

A HSI policy that is responsive to the differences between two- and four-year institutions can empower leaders in both to undertake initiatives tailored to their contexts. Community college leaders contend with a fair number of unique practical problems (Boggs & McPhail, 2016). HSI policy is poised to fund solutions at HSI community colleges known to work in other two-year contexts, including funding the uncovered tuition gap, intensive coaching, and enabling full-time attendance (Dynarski, Libassi, Michelmore, & Owen, 2018; Linderman & Kolenovic, 2013; Wyner, 2012). Similarly, policy that encourages university investment at four-year institutions to foster dialogue and enhance Latino student leadership experiences aligns with policymaker priorities.

Reinforcing the point that these sectors deserve separate consideration under HEA policy is the finding that cultural outcome data mattered differently by sector. A close look at the four-year clusters shows that only two of 10 variables were found to be significantly different. The most predictive factors of the four-year cluster were related to critical masses of Hispanic students, staff, and community. Yet, these factors are not often featured in ranking systems or other was of considering overall quality. Factors such as average net cost and graduation rate,

both of which are widely considered in ranking, were only moderate to minor predictive indicators of clustering.

On the contrary, examination of the two-year cluster groups reveals the importance of different predictive indicators. In this sector, graduation rate, and length of time as a HSI were highly weighted. In addition, differences among the institutional clusters were found in three of the five cultural outcome scores. Taken in whole, the findings of this study suggest that cultural outcomes as measured by the CCSSE may matter more in the two-year sector and may provide more meaningful differences among that group than similar measures may provide for the four-year group.

**Insufficient quantitative data to affirm servingness.** Although the work of Nuñez et al. (2016) emphasized to policymakers that enrollment is only one important factor in crafting effective HSI policy, the taxonomy could not capture measures of cultural value and difference. Based on data gathered through qualitative methods, Garcia (2017) derived the Typology of Hispanic-Serving Institution Organizational Identities. Unique in this work was the simultaneous conceptualization of traditional organizational outcomes alongside service-focused cultural outcomes.

The present study supported the findings of previous research that campus culture is positively impactful to Hispanic student experiences and success (Castillo et al., 2006; Cerezo & Chang, 2013; Garcia & Okhidoi, 2015). However, there are two critical components that policymakers may address. To begin, the cultural data available in IPEDS is insufficient and relevant cultural data gathering is not nationally mandated. To extend the point, what data were available, they were agnostic to racialized experiences.

***Cultural black box.*** Remarkably, institutions that were not clustered by organizational and cultural outcome data from secondary sources were found to have significant differences to other clusters in both the four-year and two-year cluster groups. This finding suggests that institutions that could not be clustered through an examination of IPEDS data may be clustered through more practice-specific cultural outcome data collected elsewhere. The most important parts of those cultural outcomes and the best way to retrieve that data may require further consideration. Clearly, further investigation in defining the unflustered groups of institutions is warranted.

Student Faculty Interaction is known to make a significant impact on Hispanic student retention and graduation, as well as sense of belongingness and aspiration (Aguinaga & Gloria, 2015; Chang, 2005; Cuellar, 2014; Gloria et al., 2016). Strikingly, the unclustered group of two-year institutions had significantly higher scores for Student Faculty Interaction than all three of the two-year clusters. This campus-level cultural consideration is important to the success of Latino students (Chang, 2005; Contreras, 2018; Gloria et al., 2016) but would be completely overlooked in typical high-level examinations of the entire HSI body. Moreover, it leads researchers to investigate the group of unclustered HSIs for high-impact pedagogical practices which may be extended to other HSI clusters.

The findings of this study suggested Support for Learners significantly differed among two-year HSI clusters, but the available cultural data did not always align with data collected in website review. For example, CCEND, with the highest mean Support for Learners score, initially suggested that large student sub-populations influenced institutional leadership to invest in meeting learner's needs. Having been a HSI for the long-term, it is reasonable to assume that student-focused support services evolved over time and required intentional efforts on the part of

faculty and staff. However, the website review contrasted the student self-report score collected via CCSSE. This contrary finding may be partially explained by methodological issues addressed in the limitations section. Nevertheless, the website review may have exposed shortcomings of CCEND institutions in that the intended population for specific services is not explicitly identified. If so, this finding provides an opportunity for HSI leadership to name who is served and claim intentionality over servingness.

CCMID was significantly lower in Support for Learners. The website review further illustrated this quantitative finding by highlighting the uncommon institutional characteristics of employment-specific institutions. Whereas students at other two-year cluster institutions report benefits from Support for Learners, the students attending institutions in the CCMID cluster may be particularly vulnerable when a need for support arises. This finding presents a possible contradiction in Garcia's (2017) Typology as students are not receiving service from a cultural standpoint, but also may not need or expect it from a credential-focused institution. Here, the results of the study challenge scholars to continue to remain open to servingness as being less universal by designation, and more intentional by institutional design.

Notable in the MANOVA results was that UPR had significantly lower scores in Discussions with Diverse Others than clusters UMAJ and UMIN. Considering the demographic compositions at the institutions within the clusters, the significant difference is unsurprising. Policymakers may be challenged in addressing the unique position of HSIs on the island of Puerto Rico in comparison to HSIs in the contiguous United States. From one point of view, the value of education among diverse others is widely accepted (Hurtado et al., 1999; Hurtado & Ruiz, 2012; Rubaii, 2016). This benefit is one that students at HSIs in Puerto Rican surrender. An alternative point of view acknowledges that the absence of normative White culture is what

allowed HSIs to centralize the experiences of Hispanic students (Garcia, 2019) thus allowing them a cultural space of authenticity and freedom in learning (hooks, 1996).

***Racially agnostic cultural data.*** Researchers have identified varied levels of student engagement related to college types and student demographics (Harris & BrckaLorenz, 2017; Sontam & Gabriel, 2012). Findings such as these are helpful to campus leaders who desire to make intentional changes in experiences with diversity, high-impact practices, and other initiatives (National Survey of Student Engagement, 2016).

Nonetheless, NSSE and CCSSE instrument developers began survey creation from items that were known to be related to college outcomes, knowledge developed in a research setting which normalized the White student experience (Brown, 2001; McGee, 2016). Further, among the 12 NSSE institutions listed as part of the initial pilot, all were PWIs (National Conference of State Legislatures, 2020; National Survey of Student Engagement, 2020). Although the survey questions included in NSSE and CCSSE are enlightening in many respects, there is no effort to capture the ways in which campuses centralize minority student experiences.

If NSSE and CCSSE were augmented or supplemented with an instrument known to draw out cultural congruity to campus experiences, such as the Cultural Congruity and University Environment Scale (Gloria et al., 2016; Gloria & Kurpius, 1996), then the validity of using the data from these instruments for addressing the extent to which HSIs serve Hispanic students would increase. Moreover, with the links made in this study: that organizational outcome data can be used to distinguish HSIs from one another, and that cultural outcome data may be used to further distinguish HSI clusters, policymakers may seek the regular collection of cultural data.

***Unembraced identity*.** It was noteworthy that none of the institutional websites reviewed indicated Hispanic-Serving status explicitly by way of inclusion in the mission, values, or about sections of the websites. This prevalent exclusion should give pause to researchers exploring the HSI designation as a marker of identity, rather than a funding vehicle. In other words, although HSIs should perhaps have an identity which embraces Hispanic students, the absence of the HSI marker in all the cluster website reviews suggests the label is less influential on servingness than other cultural factors.

Cluster-representative institutions embodied service to Hispanic students to varying degrees. As anticipated in Garcia's (2017) theoretical model, some institutional clusters performed higher on organizational outcomes and others embodied the centering of cultural experiences. All these differences were found regardless of the HSI label. The HSI designation may be helpful for policymakers to understand the landscape of post-secondary education, scholars seeking a critical mass of Hispanic students as a convenient research population, or leaders seeking funding through Title V funding. The question is raised: Is the designation alone impactful as an identity marker? This finding supports the conclusion of other scholars there may be other, better, markers of service to Hispanic students outside the scope of the HSI designation or federal criteria (Garcia et al., 2019).

## Limitations

There are multiple limitations to the findings of this study. Issues with the way data were conceptualized limit the application of the results. Likewise, limitations in the match between the methodology and the field of higher education should give caution.

**Conceptualizing data.** First, conceptualizing cultural outcomes was severely impacted by the absence of Hispanic-student specific data. There are no equivalent publicly available

national measures for the intimate knowledge gained through qualitative exploration. The findings of this study do not substitute for the work which brings voice to the experiences of students, staff, and faculty at HSIs. As such, the clusters should be interpreted with care, particularly when examining the differences among groups on cultural variables.

The nearest substitute for cultural outcomes was the data collected through NSSE and CCSSE. These data, however, are subject to the limitations of self-report and self-study. Similarly, in both datasets, the practices being assessed are not necessarily discreet, and may interact with each other. Moreover, the survey instruments are not designed to specifically address the racialized experiences of students at institutions. Furthermore, the instruments were created, and the data are maintained by centers, at Predominantly White Institutions, subject to the same biases which contribute to the prioritization of PWIs over HSIs. Thus, while these data sources may be the only cultural outcome measures in widespread usage at this time, they may be inadequate to capture the meaning in the theoretical model of Garcia (2017).

To capture the essence of an institutional cluster's commitment to serving Hispanic students, websites of two institutions closest to the centroid of each cluster were reviewed with a research-informed rubric, totaling 12 websites. The website analysis was hyper-focused on Latino student experiences per the rubric, and aspects that may indicate service to Latino students but not included in the rubric were not considered. The practice of using websites as a proxy for institutional identity is questionable due to the varied technological expertise and resources dedicated to online presence. Finally, examining only two websites at the center of each cluster may present a misleading or inadequate picture of an entire cluster.

**Methodological backdrop.** Although TwoStep cluster analysis is commonly used in biological and other sciences to determine natural differences within a group (Tan et al., 2006;

Tkaczynski, 2017), the differences within HSIs cannot be considered natural or organic. On the contrary, the results must be understood within a historical context of inequality in higher education practices. The stratified system of higher education in the United States cannot be accounted for through the lens of one study or resolved with one methodology.

The TwoStep cluster analysis was selected because of its ability to handle multiple levels of data. However, categorical data were never useful as predictors of cluster assignment and were only used as variables for evaluation. In retrospect a different clustering technique may have been more appropriate. Further, without identifiable cultural outcome data by institution it could not be included in the original clustering assignment. While results show differences between clusters, it may have been more useful to use cultural data in the original cluster, had the data been available for use in that way.

Finally, the present study is limited by design to indicate groupings and relationships. Readers are advised to avoid using cluster assignments to rank or create a hierarchy among HSIs. Although there are significant differences between sub-clusters, the present study does not explain causality. In addition, the present study does not explore the differences between sub-clusters in detail on each instrument scale, which would be required for more meaningful use. With the current emphasis in higher education on performance outcomes, the findings of this study should be used for exploration, and not definitive positioning.

**Implications**

Despite the limitations of this study, the findings have important theoretical and practical implications. This study shows value in a clearly defined quantitative exploration of the differences within the heterogeneous group of HSIs. Both proving in concept, and extracting key components of differences, this study serves as a foundation of exploration for future scholarship

in finding nuances among institutions that value the cultural ways of knowing for students and meet equitable performance in organizational outcomes.

In addition, the present study undergirds the claim that HSIs cannot be examined through either organizational outcomes or cultural outcomes. Both types of measures must be included to adequately capture the commonality among, and the differences between, these institutions (Garcia, 2017, 2019). Policymakers seeking a means to prioritize funding to better achieve the HEA aims should pursue an agenda which links the two types of outcomes through Title V revisions. Along the same line, data collection for both types of outcomes may require a standardization and mandate for collection.

This study narrowed the funnel of distinction among HSIs beyond only organizational, only qualitative, or only federal enrollment criteria (Nuñez et al., 2016; D. A. Santiago, 2012). Although there are dozens of possible organizational and cultural data available, this study identified six relevant datapoints for both two-year and four-year institutions. Additional analysis of these variables, separately and together, is warranted.

Further, this study can provide policymakers a basis for distinction in HEA and Title V revisions. Reaffirming the unique differences among the community college and university sectors, policymakers may respond in turn to tailor both support and aspirations for each sector. Policy responsive to the micro-, meso-, and macro- influences supports environments geared toward servingness (Garcia et al., 2019; Hurtado et al., 2012). Once more, policymakers can seek HEA revision confidently with regards to the inclusion of relevant cultural data for making explicit the meaning of service to Hispanic students.

The findings of this study suggest that NSSE and CCSSE data are relevant to provide a contextual picture for interpreting organizational outcomes. Further, the findings of this study

may imply a modification to the survey instrument which, with minor revision, may be used to capture more meaningful cultural data for understanding Latino students and the extent to which institutions those students attend prioritize Latino student experiences.

Finally, institutional leaders at HSIs can use the results of this study to better identify institutional peers. Finding similar peer institutions can help in benchmarking performance metrics and identify best practices. Using the six variables with high predictor importance can aid in more specific selection. Extending the findings to a tangential research population, institutional leaders at Emerging HSIs may be able to use the findings of to target aspirational peer institutions, then begin shaping policies and practices as the HSI threshold criteria are achieved. Because organizational identities evolve over time, the best potential future state of service-identity can be targeted early (Bolman & Deal, 2017; Manning, 2017).

**Recommendations for Future Research**

As the design of this study does not allow for cause and effect conclusions, nor can it be seen as fully representative of all HSIs, further research is warranted. Researchers may explore regression of outcomes on continuous organizational or cultural outcomes. In doing so, scholars could account for the limitations identified in this study in data usage.

A key component of Garcia's (2017) typology was that Hispanic students at HSIs were graduating at a rate at least on par with other ethnic groups. However, the graduation rate parity variable was not valuable in predictor importance during phase one or phase two clustering. Although logic would dictate parity in rates is important, and qualitative research highlights the prominence of parity in the minds of students and staff, the quantified variable did not rise to the same status. This merits further exploration and reconciliation in the body of literature.

Future researchers might find the exploration of the Hispanic populations at HSIs of value. Investigations designed to collect specific ethnicity demographics from respondents may be able to detect differences in organizational and cultural outcomes at individual institutions and within clusters. Similarly, research investigating the links between organizational and cultural outcomes are encouraged to collect data over multiple points in time within an institution. This approach will aid in answering questions about within cluster-group differences.

Scholars may pursue exploration of the student experience at Puerto Rican HSIs as unique to HSIs in the United States. Consider the unique experience of a Latino student born stateside, contending with White normative culture, attending an all-encompassing organically Hispanic institution where PWI standards are less suffocating to cultural experiences. Similarly, leaders at Puerto Rican HSIs may desire to undertake the issue of diversity on campus to find ways to increase the opportunity to improve scale scores on Discussions with Diverse Others.

Finally, although NSSE and CCSSE data were vital to the execution of this study, there were important limitations involved in their use. Smaller-scale investigations in cultural congruity, university environment, and educational outcomes have been conducted. The relationship between the Cultural Congruity and University Environment scale, which centralizes the experiences of Latino students, and the NSSE and CCSSE scales should be better understood. If Title V was revised to tie organizational and cultural outcomes or to mandate cultural outcome data collection, advanced knowledge about how the surveys can be used in conjunction with each other would be valuable.

**Research Summary**

HSIs were established in federal higher education policy in 1992. Since that time, institutions within the designated group have been treated the same, despite major differences in

mission, student population, and capacity to achieve policy goals. The findings of this study affirmed that measures of structural diversity and organizational outcomes are useful in deriving differences within a large group. The findings further affirmed the necessity to universally collect relevant data to cultural outcomes.

In summary, the current study indicated HSIs are a heterogeneous group when considered through both organizational outcomes and cultural outcomes. Not only are there meaningful differences among HSIs which policymakers can use to prioritize HEA goal attainment, but there are also meaningful cultural differences that are not currently captured through federal data collection, nor available to policymaker use. The current study suggests Carnegie Classification is one meaningful differentiator among HSIs. In addition, critical masses of student, staff, and county populations, net price, and graduation rates of Hispanic students matter, albeit to different degrees, in further differentiating both two-year and four-year groups. Markedly, cultural outcomes showed significant differences between clustered groups, and between institutions that did not cluster on IPEDS data alone. Thus, to truly quantify what it means to be *Hispanic Serving* required information beyond the current reach of policymakers. However, with revisions to the HEA, data which centralizes the experiences of Hispanic students can be part of the national mandate to collect, and then used to refine investment into Hispanic student success.

## References

Aguinaga, A., & Gloria, A. M. (2015). The effects of generational status and university environment on Latina/o undergraduates' persistence decisions. *Journal of Diversity in Higher Education, 8*(1), 15-29. doi:10.1037/a0038465

Allen, P., & Bennett, K. (2008). *SPSS for the health & behavioural sciences*. Stamford, CT: Thomson.

Alon, S., & Tienda, M. (2005). Assessing the “mismatch” hypothesis: Differences in college graduation rates by institutional selectivity. *Sociology of Education, 78*(4), 294-315. doi:10.1177/003804070507800402

Altbach, P. G., Gumport, P. J., & Berdahl, R. O. (2011). *American higher education in the twenty-first century: Social, political, and economic challenges*. Baltimore, MD: Johns Hopkins University Press.

American Association of Community Colleges. (2018). Fast facts. Retrieved from https://www.aacc.nche.edu/research-trends/fast-facts/

Anctil, E. J. (2008). Selling higher education: Marketing and advertising America's colleges and universities: ASHE Higher Education Report. *Hoboken, NJ: ASHE Higher Education Report*.

Angell, L. R. (2009). Construct validity of the Community College Survey of Student Engagement (CCSSE). *Community College Journal of Research and Practice, 33*(7), 564-570.

Arbelo-Marrero, F., & Milacci, F. (2016). A phenomenological investigation of the academic persistence of undergraduate Hispanic nontraditional students at Hispanic Serving

Institutions. *Journal of Hispanic Higher Education, 15*(1), 22-40. doi:10.1177/1538192715584192

Association for the Study of Higher Education. (2007). Navigating the straits: Overcoming challenges to faculty diversity. *ASHE Higher Education Report, 33*(1), 75-88.

Astani, M., & Elhindi, M. (2008). An empirical study of university websites. *Issues in Information Systems, 9*(2), 460-465.

Bailey, K. D. (1994). *Typologies and taxonomies: An introduction to classification techniques* (Vol. 102). Thousand Oaks, CA: Sage.

Boggs, G. R., & McPhail, C. J. (2016). *Practical leadership in community colleges: Navigating today's challenges*. Hoboken, NJ: John Wiley & Sons.

Bolman, L. G., & Deal, T. E. (2017). *Reframing organizations: Artistry, choice, and leadership* (6th ed.). Hoboken, NJ: John Wiley & Sons.

Brint, S., & Karabel, J. (1991). Institutional origins and transformations: The case of American community colleges. *The New Institutionalism in Organizational Analysis, 337*(360), 283-298.

Brown, T. N. (2001). Measuring self-perceived racial and ethnic discrimination in social surveys. *Sociological Spectrum, 21*(3), 377-392.

Bureau of Labor Statistics. (2017). *Labor force statistics from the current population survey*. Retrieved from https://www.bls.gov/cps/cpsaat18.htm.

Byrd, D. (2019). The diversity distraction: A critical comparative analysis of discourse in higher education scholarship. *Review of Higher Education, 42*, 135-172.

Caccam, M., & Refran, J. (2012). *Cluster analysis*. Presentation. SlideShare. Retrieved from https://www.slideshare.net/jewelmrefran/cluster-analysis-15529464

Calcagno, J., Bailey, T., Jenkins, D., Kienzl, G., & Leinbach, T. (2008). Community college student success: What institutional characteristics make a difference? *Economics Of Education Review, 27*(6), 632-645. doi:10.1016/j.econedurev.2007.07.003

Calderón Galdeano, E., Flores, A. R., & Moder, J. (2012). The Hispanic Association of Colleges and Universities and Hispanic-Serving Institutions: Partners in the advancement of Hispanic higher education. *Journal of Latinos & Education, 11*(3), 157-162. doi:10.1080/15348431.2012.686352

Castillo, L. G., Conoley, C. W., Choi-Pearson, C., Archuleta, D. J., Phoummarath, M. J., & Landingham, A. V. (2006). University environment as a mediator of Latino ethnic identity and persistence attitudes. *Journal of Counseling Psychology, 53*(2), 267-271. doi:10.1037/0022-0167.53.2.267

Cerezo, A., & Chang, T. (2013). Latina/o achievement at Predominantly White Universities: The importance of culture and ethnic community. *Journal of Hispanic Higher Education, 12*(1), 72-85. doi:10.1177/1538192712465626

Chang. (2005). Faculty-student interaction at the community college: A focus on students of color. *Research in Higher Education, 46*(7), 769-802. doi:10.1007/s11162-004-6225-7

Chang, Sharkness, J., Hurtado, S., & Newman, C. B. (2014). What matters in college for retaining aspiring scientists and engineers from underrepresented racial groups. *Journal of Research in Science Teaching, 51*(5), 555-580. doi:10.1002/tea.21146

Clark, B. R. (1960). The" cooling-out" function in higher education. *American Journal of Sociology, 65*(6), 569-576.

Cohn, D. (2010). Census history: Counting Hispanics. *Pew Research Center: Social & Deomgraphic Trends.* Retrieved from https://www.pewsocialtrends.org/2010/03/03/census-history-counting-hispanics-2/

Cole, S., & Arias, E. (2004). Can demand-side variables explain the low numbers of minority faculty in higher education? *American Economic Review, 94*(2), 291-295.

Community College Research Center. (2019). Community college FAQs. Retrieved from https://ccrc.tc.columbia.edu/Community-College-FAQs.html

Community College Survey of Student Engagement. (2019). *About the survey.* Retrieved from https://www.ccsse.org/aboutsurvey/aboutsurvey.cfm

Constantine, M. G., Robinson, J. S., & Wilton, L. (2002). Collective self-esteem and perceived social support as predictors of cultural congruity among Black and Latino college students. *Journal of College Student Development, 43*(3), 307-316.

Constantine, M. G., & Watt, S. K. (2002). Cultural congruity, womanist identity attitudes, and life satisfaction among African American college women attending historically Black and predominantly White institutions. *Journal of College Student Development, 43*(2), 184-194.

Contreras, F. (2018). Latino faculty in Hispanic-Serving Institutions: Where is the diversity? *Association of Mexican American Educators Journal, 11*(3), 223-250.

Contreras, F., & Contreras, G. J. (2015). Raising the bar for Hispanic Serving Institutions: An analysis of college completion and success rates. *Journal of Hispanic Higher Education, 14*(2), 151-170. doi:10.1177/1538192715572892

Craig, A. J., & Ward, C. V. L. (2007). Retention of community college students: Related student and institutional characteristics. *Journal of College Student Retention: Research, Theory & Practice, 9*(4), 505-517. doi:10.2190/CS.9.4.f

Crisp, G., Nora, A., & Taggart, A. (2009). Student characteristics, pre-college, college, and environmental factors as predictors of majoring in and earning a STEM degree: An analysis of students attending a Hispanic Serving Institution. *American Educational Research Journal, 46*(4), 924-942. doi:10.3102/0002831209349460

Cuellar, M. (2012). *Latina/o student success in higher education: Models of empowerment at Hispanic Serving-Institutions (HSIs), emerging HSIs, and non-HSIs.* ProQuest Dissertations Publishing,

Cuellar, M. (2014). The impact of Hispanic-Serving Institutions (HSIs), emerging HSIs, and non-HSIs on Latina/o academic self-concept. *Review of Higher Education, 37*(4), 499-530. doi:10.1353/rhe.2014.0032

Cuellar, M., & Johnson-Ahorlu, R. N. (2016). Examining the complexity of the campus racial climate at a Hispanic Serving community college. *Community College Review, 44*(2), 135-152. doi:10.1177/0091552116632584

Dayton, A., & Rogoff, B. (2013). 'On being indigenous' as a process. *Human Development, 56*(2), 106-112. doi:10.1159/000346771

Demetriou, C., & Schmitz-Sciborski, A. (2011). *Integration, motivation, strengths and optimism: Retention theories past, present and future*. Paper presented at the Proceedings of the 7th National Symposium on Student Retention. https://pdfs.semanticscholar.org/909d/94498abfe9d8606994c319509f43ac6b06fa.pdf

Dougherty, K. J. (1994a). The community college: The impact, origin, and future of a contradictory institution. In B. Townsend & D. Bragg (Eds.), *ASHE Reader on Community Colleges* (pp. 75-82). New York, NY: Pearson.

Dougherty, K. J. (1994b). Introduction. In B. Townsend & D. Bragg (Eds.), *ASHE Reader on Community Colleges* (pp. 49-54). New York, NY: Pearson.

Dowd, A. C. (2003). From access to outcome equity: Revitalizing the democratic mission of the community college. *The ANNALS of the American Academy of Political and Social Science, 586*(1), 92-119.

Dowd, A. C. (2007). Community colleges as gateways and gatekeepers: Moving beyond the access "saga" toward outcome equity. *Harvard Educational Review, 77*(4), 407-419.

Dynarski, S., Libassi, C., Michelmore, K., & Owen, S. (2018). *Closing the gap: The effect of a targeted, tuition-free promise on college choices of high-achieving, low-income students*. Retrieved from National Bureau of Economic Research

Edman, J. L., & Brazil, B. (2009). Perceptions of campus climate, academic efficacy and academic success among community college students: An ethnic comparison. *Social Psychology of Education, 12*(3), 371-383. doi:10.1007/s11218-008-9082-y

Ellet, W. (2007). *The case study handbook: How to read, discuss, and write persuasively about cases*. Brighton, MA: Harvard Business Press.

Espinosa, L. L., Crandall, J. R., & Tukibayeva, M. (2014). Rankings, institutional behavior, and college and university choice: Framing the national dialogue on Obama's ratings plan. *Washington, DC: American Council on Education*.

Excelencia in Education. (2010). Hispanic-Serving Institutions (HSIs) historical timeline. Retrieved from https://www.edexcelencia.org/media/562

Excelencia in Education. (2019). *Latinos in higher education: Compilation of fast facts*. Retrieved from Excelencia in Education www.EdExcelencia.org/FastFacts-2019

Excelencia in Education. (2020). Growing what works database. Retrieved from https://www.edexcelencia.org/programs-initiatives/growing-what-works-database

Fleetwood, J., & Aebersold, N. (2010). Fostering equity & diversity in faculty recruitment. *Academic Leadership (15337812), 8*(4), 70-70.

Fleury, M.-J., Grenier, G., & Bamvita, J.-M. (2015). Predictive typology of subjective quality of life among participants with severe mental disorders after a five-year follow-up: A longitudinal two-step cluster analysis. *Health and Quality of Life Outcomes, 13*(1), 150.

Flores, S. M., & Park, T. (2015). The effect of enrolling in a Minority-Serving Institution for Black and Hispanic students in Texas. *Research in Higher Education, 56*(3), 247-276. doi:10.1007/s11162-014-9342-y

Flores, S. M., & Park, T. J. (2013). Race, ethnicity, and college success: Examining the continued significance of the Minority-Serving Institution. *Educational Researcher, 42*(3), 115-128. doi:10.3102/0013189X13478978

Fosnacht, K., & Gonyea, R. M. (2018). The dependability of the updated NSSE: A generalizability study. *Research & Practice in Assessment, 13*, 62-73.

Franklin, R. S. (2013). The roles of population, place, and Institution in student diversity in American higher education. *Growth and Change, 44*(1), 30-53. doi:10.1111/grow.12001

Gallup. (2018). *Examining life outcomes among graduates of Hispanic-Serving Institutions: 2018 HSIs and workforce survey*. Retrieved from Excelencia in Education https://www.edexcelencia.org/media/769

Gamst, G., Meyers, L. S., & Guarino, A. (2008). *Analysis of variance designs: A conceptual and computational approach with SPSS and SAS*. Boston, MA: Cambridge University Press.

Garcia, G. A. (2013a). *Challenging the manufactured identity of Hispanic Serving Institutions (HSIs): Co-constructing an organizational identity.* (Doctoral Dissertation), ProQuest Dissertations Publishing database. (UMI No. 3563322)

Garcia, G. A. (2013b). Does percentage of Latinas/os affect graduation rates at 4-year Hispanic Serving Institutions (HSIs), Emerging HSIs, and non-HSIs? *Journal of Hispanic Higher Education, 12*(3), 256-268. doi:10.1177/1538192712467203

Garcia, G. A. (2016a). Complicating a Latina/o-serving identity at a Hispanic Serving Institution. *Review of Higher Education, 40*(1), 117-143. doi:10.1353/rhe.2016.0040

Garcia, G. A. (2016b). Exploring student affairs professionals' experiences with the campus racial climate at a Hispanic Serving Institution (HSI). *Journal of Diversity in Higher Education, 9*(1), 20.

Garcia, G. A. (2017). Defined by outcomes or culture? Constructing an organizational identity for Hispanic-Serving Institutions. *American Educational Research Journal, 54*(1), 111-134. doi:10.3102/0002831216669779

Garcia, G. A. (2019). *Becoming Hispanic-Serving Institutions: Opportunities for colleges and universities*. Baltimore, MD: Johns Hopkins University Press.

Garcia, G. A., Núñez, A.-M., & Sansone, V. A. (2019). Toward a multidimensional conceptual framework for understanding "servingness" in Hispanic-Serving Institutions: A synthesis of the research. *Review of Educational Research, 89*(5), 745-784.

Garcia, G. A., & Okhidoi, O. (2015). Culturally relevant practices that 'serve' students at a Hispanic Serving Institution. *Innovative Higher Education, 40*(4), 345-357. doi:10.1007/s10755-015-9318-7

Gasman, M., Samayoa, A. C., & Nettles, M. (2017). Investing in student success: Examining the return on investment for minority-Serving Institutions. *ETS Research Report Series, 2017*(1), 1-66. doi:10.1002/ets2.12187

Geiger, R. L. (2015). *The history of American higher education: Learning and culture from the founding to World War II*. Princeton, NJ: Princeton University Press.

Gloria, A. M., Castellanos, J., & Orozco, V. (2005). Perceived educational barriers, cultural fit, coping responses, and psychological well-being of Latina undergraduates. *Hispanic Journal of Behavioral Sciences, 27*(2), 161-183. doi:10.1177/0739986305275097

Gloria, A. M., Herrera, N., & Castellanos, J. (2016). The reliability and validity of the Cultural Congruity and University Environment scales with Chicana/o community college students. *Community College Journal of Research & Practice, 40*(5), 426-438. doi:10.1080/10668926.2015.1066276

Gloria, A. M., & Kurpius, S. E. R. (1996). The validation of the Cultural Congruity scale and the University Environment scale with Chicano/a students. *Hispanic Journal of Behavioral Sciences, 18*, 533-549. doi:10.1177/07399863960184007

Godreau, I., Gavillán-Suárez, J., Franco-Ortiz, M., Calderón-Squiabro, J. M., Marti, V., & Gaspar-Concepción, J. (2015). Growing faculty research for students' success: Best practices of a research institute at a Minority-Serving undergraduate Institution. *Journal of Research Administration, 46*(2), 55-78.

Gonzales, L. D. (2015). An acción approach to affirmative action: Hispanic-Serving Institutions as spaces for fostering epistemic justice. *Association of Mexican American Educators Journal, 9*(1), 28-41.

Gonzalez, R. G. (2010). Ethnic identity at a majority Hispanic-Serving Institution. *Journal of Latinos & Education, 9*(4), 284-302. doi:10.1080/15348431.2010.491041

Gooden, S., & Martin, K. (2014). Facilitating college success among Emerging Hispanic Serving Institutions: Multiple perspectives yield commonly shared diversity goals. *Journal of Public Management & Social Policy, 20*(1), 3-28.

Grice, J. W., & Iwasaki, M. (2007). A truly multivariate approach to manova. *Applied Multivariate Research, 12*(3), 199-226.

Guardia, J. R., & Evans, N. J. (2008). Factors influencing the ethnic identity development of Latino fraternity members at a Hispanic Serving Institution. *Journal of College Student Development, 49*(3), 163-181. doi:10.1353/csd.0.0011

Hagedorn, L. S., Chi, W., & Cepeda, R. M. (2007). An investigation of critical mass: The role of Latino representation in the success of urban community college students. *Research in Higher Education, 48*(1), 73-91. doi:10.1007/s11162-006-9024-5

Halpin, R. L. (1990). An application of the Tinto model to the analysis of freshman persistence in a community college. *Community College Review, 17*, 22-32. doi:10.1177/009155219001700405

Harris, J. C., & BrckaLorenz, A. (2017). Black, White, and biracial students' engagement at differing institutional types. *Journal of College Student Development, 58*(5), 783-789.

Hays, D. G., & Singh, A. A. (2012). *Qualitative inquiry in clinical and educational settings*. New York, NY: The Guilford Press.

Hayter, A. J. (1986). The maximum familywise error rate of fisher's least significant difference test. *Journal of the American Statistical Association, 81*(396), 1000-1004.

Hegji, A. (2014). *The Higher Education Act (HEA): A primer*. Retrieved from Washington, D.C.: Congressional Research Service https://www.wisconsin.edu/government-relations/download/the_washington_view_blog/The-Higher-Education-Act-(HEA)---A-Primer.pdf

Hennig, C., Meila, M., Murtagh, F., & Rocci, R. (2015). *Handbook of cluster analysis*. Boca Raton, FL: CRC Press.

Higher Education Act, 20 U.S.C. §§ 1101-1103 Pub. L. No. 102-325.

Hispanic Association of Colleges and Universities. (2008). *Fact sheet: 2008.* Retrieved from https://www.hacu.net/hacu/default.asp

Hispanic Association of Colleges and Universities. (2018). 2018 fact sheet. Retrieved from https://www.hacu.net/hacu/HSI_Fact_Sheet.asp

Hispanic Association of Colleges and Universities. (2019). *2019 HACU legislative agenda*. Retrieved from Hispanic Association of Colleges and Universities https://www.hacu.net/images/hacu/2019%20HACU%20Legislative%20Agenda.pdf

Holland, J. L. (1958). A personality inventory employing occupational titles. *Journal of Applied Psychology, 42*, 336 –342.

hooks, b. (1996). *Teaching to transgress: Education as the practice of freedom*. New York, NY: Routledge.

Horn, L. (2006). Placing college graduation rates in context: How 4-year college graduation rates vary with selectivity and the size of low-income enrollment. Postsecondary education descriptive analysis report. NCES 2007-161. *National Center for Education Statistics*.

Hurtado, S., Alvarado, A. R., & Guillermo-Wann, C. (2015). Thinking about race: The salience of racial identity at two- and four-year colleges and the climate for diversity. *Journal Of Higher Education*, *86*(1), 127-155.

Hurtado, S., Alvarez, C. L., Guillermo-Wann, C., Cuellar, M., & Arellano, L. (2012). A model for diverse learning environments. In *Higher education: Handbook of theory and research* (pp. 41-122). New York, NY: Springer.

Hurtado, S., Milem, J. F., & Clayton-Pedersen, A. (1999). Enacting diverse learning environments: Improving the climate for racial/ethnic diversity in higher education. *ASHE-ERIC Higher Education Report*, *26*(8), 1-116.

Hurtado, S., & Ruiz, A. (2012). *Realizing the potential of Hispanic-Serving Institutions: Multiple dimensions of institutional diversity for advancing Hispanic higher education*. White Paper. Retrieved from https://vtechworks.lib.vt.edu/bitstream/handle/10919/83072/RealizingHispanicServingInstitutions.pdf?sequence=1&isAllowed=y

IBM Corp. (2017). IBM SPSS statistics for Windows, version 25.0., from IBM Corp

IBM Corp. (n.d.-a). SSCP matrices and multivariate tests. Retrieved from https://www.ibm.com/support/knowledgecenter/SSLVMB_24.0.0/spss/tutorials/glmm_patlos_mult.html

IBM Corp. (n.d.-b). Two-step cluster analysis. Retrieved from https://www.ibm.com/support/knowledgecenter/en/SSLVMB_24.0.0/spss/base/idh_twostep_main.html

Iloh, C. (2014). A critical comparison of website marketing at for-profit colleges and community colleges. *NASAP Journal*, *15*(2), 91-106.

Institute for Women's Policy Research. (2018). *Understanding the new college majority: The demographic and financial characteristics of independent students and their postsecondary outcomes* (C462). Retrieved from https://iwpr.org/wp-content/uploads/2018/02/C462_Understanding-the-New-College-Majority_final.pdf

Ireland, S. M.-Y. (2015). Fostering success or stratification? A macroapproach to understanding "success" in the community college context. *Community College Journal of Research and Practice, 39*(2), 150-162.

Jackson-Weaver, K., Baker, E. B., Gillespie, M. C., Ramos Bellido, C. G., & Watts, A. W. (2010). Recruiting the next generation of the professoriate. *Peer Review, 12*(3), 11-14.

Jackson, J. F. L., & Phelps, L. A. (2004). Diversity in the two-year college academic workforce. *New Directions for Community Colleges, 2004*(127), 79-88.

Jacobo, R., & Ochoa, A. M. (2011). Examining the experiences of undocumented college students: Walking the known and unknown lived spaces. *Association of Mexican American Educators Journal, 5*(1), 22-30.

Jones, W. A. (2013). The relationship between student body racial composition and the normative environment toward diversity at community colleges. *Community College Review, 41*(3), 249-265. doi:10.1177/0091552113497090

Kittle, B., & Ciba, D. (1999). *Relationship marketing in higher education via the World Wide Web: A study of home pages examining student retention strategies.* Paper presented at the Proceedings of the 1998 Symposium for the Marketing of Higher Education, American Marketing Association, Chicago.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32*(3), 465-491.

Lascher, E. L. (2018). *Retaining Latino and non-Latino college students: Key similarities and differences*. Retrieved from https://csus-dspace.calstate.edu/bitstream/handle/10211.3/207063/10.1.1.523.9522.pdf?sequence=1

Lester, J., Brown Leonard, J., & Mathias, D. (2013). Transfer student engagement: Blurring of social and academic engagement. *Community College Review, 41*(3), 202-222.

Levin, J. S., Viggiano, T., López Damián, A. I., Morales Vazquez, E., & Wolf, J.-P. (2017). Polymorphic students. *Community College Review, 45*(2), 119-143. doi:10.1177/0091552116679731

Linderman, D., & Kolenovic, Z. (2013). Moving the completion needle at community colleges: CUNY's Accelerated Study in Associate Programs (ASAP). *Change: The Magazine of Higher Learning, 45*(5), 43-50.

Locke, W. (2009). Reconnecting the research–policy–practice nexus in higher education:‘Evidence-based policy’in practice in national and international contexts. *Higher Education Policy, 22*(2), 119-140.

Lott, B., & Rogers, M. R. (2011). Ethnicity matters for undergraduate majors in challenges, experiences, and perceptions of psychology. *Cultural Diversity & Ethnic Minority Psychology, 17*(2), 204-210. doi:10.1037/a0023673

Lui Abel, A. (2008). *The development of a conceptual framework and taxonomy for defining and classifying corporate universities.* ProQuest Dissertations Publishing, Retrieved from https://search.proquest.com/openview/56d4243f67f4b03ed3b45ad909dd49e7/1?pq-origsite=gscholar&cbl=18750&diss=y

MacDonald, V.-M., Botti, J., & Clark, L. H. (2007). From visibility to autonomy: Latinos and higher education in the US, 1965–2005. *Harvard Educational Review, 77*(4), 474-504.

Maher, F. A., & Tetreault, M. K. T. (2011). Long-term transformations: Excavating privilege and diversity in the academy. *Gender and Education, 23*(3), 281-297. doi:10.1080/09540253.2010.491790

Manning, K. (2017). *Organizational theory in higher education*. New York, NY: Routledge.

Margolin, J., Miller, S. R., & Rosenbaum, J. E. (2013). The community college website as virtual advisor: A usability study. *Community College Review, 41*(1), 44-62.

Marti, C. N. (2008). Dimensions of student engagement in American community colleges: Using the community college student report in research and practice. *Community College Journal of Research and Practice, 33*(1), 1-24.

Martin, B. S. (2018). *A typology of police departments in the Commonwealth of Pennsylvania.* (Ph.D.), ProQuest Dissertations & Theses Global, Retrieved from https://odu-primo.hosted.exlibrisgroup.com/permalink/f/1ucqpjv/TN_proquest2085291369

Martinez, M. (2015). An examination of organizational change through Nevada's emerging Hispanic-Serving Institutions. *New Directions for Higher Education, 2015*(172), 19-28. doi:10.1002/he.20149

McFarland, J., Hussar, B., de Brey, C., Snyder, T., Wang, X., Wilkinson-Flicker, S., . . . Barmer, A. (2017). The condition of education 2017. NCES 2017-144. *National Center for Education Statistics*.

McGee, E. O. (2016). Devalued Black and Latino racial identities: A by-product of STEM college culture? *American Educational Research Journal, 53*(6), 1626-1662.

Medina, C. A., & Posadas, C. E. (2012). Hispanic student experiences at a Hispanic-Serving Institution: Strong voices, key message. *11*, 182-188. doi:10.1080/15348431.2012.686358

Melguizo, T. (2008). Quality matters: Assessing the impact of attending more selective institutions on college completion rates of minorities. *Research in Higher Education, 49*(3), 214-236.

Mellow, G. O., & Heelan, C. M. (2014). *Minding the dream: The process and practice of the American community college*. Lanham, MD: Rowman & Littlefield.

Mercer, C. (2008). *Title III and Title V of the Higher Education Act: Background and reauthorization issues* (RL31647). Retrieved from http://congressionalresearch.com/RL31647/document.php?study=Title+III+and+Title+V+of+the+Higher+Education+Act+Background+and+Reauthorization+Issues

Merisotis, J. P., & McCarthy, K. (2005). Retention and student success at Minority-Serving Institutions. *New Directions for Institutional Research, 2005*(125), 45-58. doi:10.1002/ir.138

Merriam, S. B. (1997). *Qualitative research and case study applications in education: Revised and expanded from case study research in education*. Somerset, NJ: Wiley.

Meyer, K., & Rosinger, K. (2019). Applying behavioral insights to improve postsecondary education outcomes: A review of Obama administration efforts and next steps under the Trump administration. *Journal of Policy Analysis and Management, 38*(2), 481-499. doi:10.1002/pam.22123

Meyers, L. S., Gamst, G., & Guarino, A. J. (2016). *Applied multivariate research: Design and interpretation*. Thousand Oaks, CA: Sage.

Miller. (2018, April 18). The good and bad news in college attainment trends. Retrieved from https://www.americanprogress.org/issues/education-postsecondary/news/2018/04/18/449758/good-bad-news-college-attainment-trends/

Miller, Sarraf, S. A., Dumford, A. D., & Rocconi, L. M. (2016). *Construct validity of NSSE engagement indicators*. Retrieved from http://nsse.indiana.edu/pdf/psychometric_portfolio/Validity_ConstructValidity_FactorAnalysis_2013.pdf

Mullin, C. M., Baime, D. S., & Honeyman, D. S. (2015). *Community college finance: A guide for institutional leaders*. San Francisco, CA: Jossey-Bass.

Murakami-Ramalho, E., Nunez, A.-M., & Cuero, K. K. (2010). Latin@ advocacy in the hyphen: Faculty identity and commitment in a Hispanic-Serving Institution. *International Journal of Qualitative Studies in Education, 23*(6), 699-717. doi:10.1080/09518391003641924

Musoba, G. D., & Krichevskiy, D. (2014). Early coursework and college experience predictors of persistence at a Hispanic-Serving Institution. *Journal of Hispanic Higher Education, 13*(1), 48-62. doi:10.1177/1538192713513463

National Center for Education Statistics. (2017). *Status and trends in the education of racial and ethnic groups: Indicator 18 college participation rates*. Retrieved from https://nces.ed.gov/programs/raceindicators/indicator_rea.asp

National Center for Education Statistics. (2019). Indicator 23: Postsecondary graduation rates. Retrieved from https://nces.ed.gov/programs/raceindicators/indicator_red.asp

National Conference of State Legislatures. (2020). Collegenavigator. Retrieved from https://nces.ed.gov/collegenavigator/

National Student Clearinghouse Research Center. (2017). Current term enrollment esitmates. Retrieved from https://nscresearchcenter.org/current-term-enrollment-estimates-fall-2017/

National Survey of Student Engagement. (2016). Using NSSE data. Retrieved from http://nsse.indiana.edu/2016_Institutional_Report/pdf/Using_NSSE_Data_2016.pdf

National Survey of Student Engagement. (2019). Psychometric portfolio. Retrieved from http://nsse.indiana.edu/html/psychometric_portfolio.cfm

National Survey of Student Engagement. (2020). Our origins and potential. Retrieved from https://nsse.indiana.edu/html/origins.cfm

Neufeld, R. W., & Gardner, R. C. (1990). Data aggregation in evaluating psychological constructs: Multivariate and logical deductive considerations. *Journal of Mathematical Psychology, 34*(3), 276-296.

Nilashi, M., Jannach, D., bin Ibrahim, O., Esfahani, M. D., & Ahmadi, H. (2016). Recommendation quality, transparency, and website quality for trust-building in recommendation agents. *Electronic Commerce Research and Applications, 19*, 70-84.

Norušis, M. J. (2012). *IBM SPSS statistics 19 statistical procedures companion*. Upper Saddle River, NJ: Prentice Hall.

Nuñez, A.-M., & Crisp, G. (2012). Ethnic diversity and Latino/a college access: A comparison of Mexican American and Puerto Rican beginning college students. *Journal of Diversity in Higher Education, 5*(2), 78.

Nuñez, A.-M., Crisp, G., & Elizondo, D. (2016). Mapping Hispanic-Serving Institutions: A typology of institutional diversity. *Journal Of Higher Education, 87*(1), 55-83.

Nuñez, A.-M., & Elizondo, D. (2012). Hispanic-Serving Institutions in the US mainland and Puerto Rico: Organizational characteristics, institutional financial context, and graduation outcomes. A white paper for HACU. *Hispanic Association of Colleges and Universities*.

Nuñez, A.-M., Sparks, P. J., & Hernandez, E. A. (2011). Latino access to community colleges and Hispanic- Serving Institutions: A national study. *Journal of Hispanic Higher Education, 10*(1), 18-40. doi:10.1177/1538192710391801

Okamoto, D., & Mora, G. C. (2014). Panethnicity. *Annual Review of Sociology, 40*, 219-239.

Pace, C. R. (1969). *College and university environment scales* (3rd ed.). Princeton, NJ: Educational Testing Service.

Pérez, P. A., & Ceja, M. (2010). Building a Latina/o student transfer culture: Best practices and outcomes in transfer to universities. *Journal of Hispanic Higher Education, 9*(1), 6-21. doi:10.1177/1538192709350073

Perrakis, A., & Hagedorn, L. S. (2010). Latino/a student success in community colleges and Hispanic-Serving Institution status. *Community College Journal of Research & Practice, 34*(10), 797-813. doi:10.1080/10668921003723110

Ponjuan, L., Palomin, L., & Calise, A. (2015). Latino male ethnic subgroups: Patterns in college enrollment and degree completion. *New Directions for Higher Education, 172*(2015), 59-69.

Poock, M. C., & Lefond, D. (2001). How college-bound prospects perceive university web sites: Findings, implications, and turning browsers into applicants. *College and University, 77*(1), 15-21.

Price, E. G., Powe, N. R., Kern, D. E., Golden, S. H., Wand, G. S., & Cooper, L. A. (2009). Improving the diversity climate in academic medicine: Faculty perceptions as a catalyst for institutional change. *Journal of the Association of American Medical Colleges, 84*(1), 95-105. doi:10.1097/ACM.0b013e3181900f29

Reynolds, A. L., & Weigand, M. J. (2010). The relationships among academic attitudes, psychological attitudes, and the first-semester academic achievement of first-year college students. *Journal of Student Affairs Research & Practice, 47*(2), 173-193. doi:10.2202/1949-6605.6004

Rich, P. (1992). The organizational taxonomy: Definition and design. *Academy of Management Review, 17*(4), 758-781.

Rodríguez, A., & Galdeano, E. C. (2015). Do Hispanic-Serving Institutions really underperform? Using propensity score matching to compare outcomes of Hispanic-Serving and non–Hispanic-Serving Institutions. In A.-M. Nunez, S. Hurtado, & E. C. Galdeano (Eds.), *Hispanic-Serving Institutions: Advancing research and transformative practice* (pp. 196-216). Florence, KY: Taylor and Francis.

Rodriguez, A., & Kelly, A. P. (2014). Access, affordability, and success: How do America's colleges fare and what could it mean for the president's ratings plan? *AEI Paper & Studies*.

Rubaii, N. (2016). Promoting social equity, diversity, and inclusion through accreditation. *Quality Assurance in Education: An International Perspective, 24*(4), 541-561. doi:10.1108/QAE-02-2016-0007

Santiago, C. (2012). *Faculty as institutional agents for low-income Latino students in science, technology, engineering, and mathematics fields at a Hispanic-Serving Institution.* ProQuest Dissertations & Theses Global, Retrieved from https://odu-primo.hosted.exlibrisgroup.com/permalink/f/1ucqpjv/TN_proquest1289081525

Santiago, D. A. (2007). *Choosing Hispanic-serving institutions (HSIs): A closer look at Latino students' college choices*. Retrieved from Excelencia in Educaiton

Santiago, D. A. (2009). *Leading in a changing america: Presidential perspectives from Hispanic-Serving Institutions (HSIs)*. Retrieved from https://www.edexcelencia.org/research/issue-briefs/leading-changing-america-presidential-perspectives-hispanic-serving

Santiago, D. A. (2012). Public policy and Hispanic-Serving Institutions: From invention to accountability. *Journal of Latinos & Education, 11*(3), 163-167. doi:10.1080/15348431.2012.686367

Santiago, D. A., & Andrade, S. J. (2010). *Emerging Hispanic-Serving Institutions (HSIs): Serving Latino students*. Retrieved from Excelencia in Education http://www.edexcelencia.org/hsi-cp2/research/emerging-hispanic-serving-institutions-hsis-serving-latino-students

Santiago, D. A., Taylor, M., & Galdeano, E. C. (2016). *From capacity to success: HSIs, Title V, and Latino students*. Retrieved from Excelencia in Education http://www.edexcelencia.org/research/capacity

Schneider, S. M., & Foot, K. A. (2004). The web as an object of study. *New Media & Society, 6*(1), 114-122.

Seaman, M. A., Levin, J. R., & Serlin, R. C. (1991). New developments in pairwise multiple comparisons: Some powerful and practicable procedures. *Psychological Bulletin, 110*(3), 577.

Sebanc, A. M., Hernandez, M. D., & Alvarado, M. (2009). Understanding, connection, and identification: Friendship features of bilingual Spanish-English speaking undergraduates. *Journal of Adolescent Research, 24*(2), 194-217.

Shapiro, D., Dundar, A., Wakhungu, P. K., Yuan, X., Nathan, A., & Hwang, Y. (2016). Time to degree: A national view of the time enrolled and elapsed for associate and bachelor's degree earners: Signature report no. 11. *National Student Clearinghouse*.

Sharif, F. S. (2015). *Characteristics of highly ranked universities in the Times Higher Education (THE) World University Rankings*. Retrieved from https://vtechworks.lib.vt.edu/bitstream/handle/10919/79640/BBcharactistics-of-top-the-universities.pdf?sequence=1&isAllowed=y

Sontam, V., & Gabriel, G. (2012). Student engagement at a large suburban community college: Gender and race differences. *Community College Journal of Research and Practice, 36*(10), 808-820.

Sprinthall, R. C. (2012). *Basic statistical analysis* (9th ed.). Boston, MA: Allyn & Bacon.

St. John, E. P., Daun-Barnett, N., & Moronski-Chapman, K. M. (2018). *Public policy and higher education: Reframing strategies for preparation, access, and college success*. New York, NY: Routledge.

Stout, R., Archie, C., Cross, D., & Carman, C. A. (2018). The relationship between faculty diversity and graduation rates in higher education. *Intercultural Education, 29*(3), 399-417.

Tan, P.-N., Steinbach, M., & Kumar, V. (2006). Cluster analysis: Basic concepts and algorithms. *Introduction to Data Mining, 8*, 487-568.

Taylor, O., Apprey, C. B., Hill, G., McGrann, L., & Jianping, W. (2010). Diversifying the faculty. *Peer Review, 12*(3), 15-18.

Terenzini, P. T., & Pascarella, E. T. (1991). Twenty years of research on college students: Lessons for future research. *Research in Higher Education, 32*, 83-92. doi:10.1007/BF00992835

Thomas, L. (2002). Student retention in higher education: The role of institutional habitus. *Journal of Education Policy, 17*(4), 423-442. doi:10.1080/02680930210140257

Tinsley, H. E., & Brown, S. D. (2000). *Handbook of applied multivariate statistics and mathematical modeling*. Cambridge, MA: Academic Press.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*, 89-125.

Tinto, V. (2000). Linking learning and leaving: Exploring the role of the college classroom in student departure. In J. M. Braxton (Ed.), Reworking the student departure puzzle (Vol. 81-94). Nashville, TN: Vanderbilt University Press. Retrieved from https://vtinto.expressions.syr.edu/wp-content/uploads/2013/01/Linking-Learning-and-Leaving.pdf.

Tkaczynski, A. (2017). Segmentation using two-step cluster analysis. In *Segmentation in social marketing* (pp. 109-125). New York, NY: Springer.

Torres, V., & Zerquera, D. (2012). Hispanic-Serving Institutions: Patterns, predictions, and implications for informing policy discussions. *Journal of Hispanic Higher Education, 11*(3), 259-278. doi:10.1177/1538192712441371

Turner, C. S. (2015). Lessons from the field: Cultivating nurturing environments in higher education. *The Review of Higher Education, 38*(3), 333-358.

U.S. Department of Education. (2009a). Hispanic-Serving Institutions division. Retrieved from http://www.hacu.net/images/hacu/conf/28ac/Mon_1030_FedFundDoE.pdf

U.S. Department of Education. (2009b). *Title V, developing Hispanic-Serving Institutions program technical assistance workshop*. Power Point. Retrieved from https://www.hacu.net/images/hacu/govrel/2009%20Title%20V%20presentation%20DoEd.050609.pdf

U.S. Department of Education. (2017, August 31). Hispanic-Serving Institutions division - home page. Retrieved from https://www2.ed.gov/about/offices/list/ope/idues/hsidivision.html

U.S. Department of Education. (2018). Definition of Hispanic-Serving Institutions. Retrieved from https://www2.ed.gov/programs/idueshsi/definition.html

Umbach, P. (2006). The contribution of faculty of color to undergraduate education. *Research in Higher Education, 47*(3), 317-345. doi:10.1007/s11162-005-9391-3

Urrieta, L. (2004). Chicana/o activism and education: An introduction to the special issue. *The High School Journal, 87*(4), 1-9.

Valdez, P. L. (2015). An overview of Hispanic-Serving Institutions' legislation: Legislation policy formation between 1979 and 1992. In J. P. Mendez, I. Bonner, F. A., J. Méndez-Negrette, & R. T. Palmer (Eds.), *Hispanic Serving Institutions in American higher education: Their origin, and present and future challenges* (pp. 5-29). Sterling, VA: Stylus Publishing, LLC.

Vaughan, G. B. (1991). Institutions on the edge: America's community colleges. *Viewpoints*.

Vaughan, G. B. (2006). *The community college story*. Washington, D.C.: American Association of Community Colleges.

Walsh, W. B. (1973). *Theories of person-environment interaction: Implications for the college student.* Iowa City, IA: American College Testing Program.

Webber, D. A. (2017). Risk-sharing and student loan policy: Consequences for students and institutions. *Economics Of Education Review, 57,* 1-9.

Witkow, M. R., Gillen-O'Neel, C., & Fuligni, A. J. (2012). College social engagement and school identification: Differences by college type and ethnicity. *Journal of Applied Developmental Psychology, 33*(5), 243-251. doi:10.1016/j.appdev.2012.06.003

Wyner, J. (2012). What is community college excellence? Lessons from the Aspen prize. *Change: The Magazine of Higher Learning, 44*(3), 14-20.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed. Vol. 5). Thousand Oaks, CA: SAGE Publications.

Yosso, T. J., Smith, W. A., Ceja, M., & Solórzano, D. G. (2009). Critical race theory, racial microaggressions, and campus racial climate for Latina/o undergraduates. *Harvard Educational Review, 79*(4), 659-690.

# APPENDIX

OLD DOMINION UNIVERSITY

OFFICE OF THE VICE PRESIDENT FOR RESEARCH

**Physical Address**
4111 Monarch Way, Suite 203
Norfolk, Virginia 23508
**Mailing Address**
Office of Research
1 Old Dominion University
Norfolk, Virginia 23529
Phone(757) 683-3460
Fax(757) 683-5902

| | |
|---|---|
| DATE: | August 21, 2019 |
| TO: | Chirs Glass |
| FROM: | Old Dominion University Education Human Subjects Review Committee |
| PROJECT TITLE: | [1480718-1] HSI-Clusters |
| REFERENCE #: | |
| SUBMISSION TYPE: | New Project |
| ACTION: | DETERMINATION OF EXEMPT STATUS |
| DECISION DATE: | August 21, 2019 |
| REVIEW CATEGORY: | Exemption category # *4* |

Thank you for your submission of New Project materials for this project. The Old Dominion University Education Human Subjects Review Committee has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Laura Chezan at (757) 683-7055 or lchezan@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old Dominion University Education Human Subjects Review Committee's records.

# VITA

*Professional Experience*

- Eastern Virginia Medical School, Instructional Designer, September 2019 – Present
- Old Dominion University, Student Success Advisor Graduate Assistant, August 2018 – September 2019
- Tidewater Community College, Faculty Professional Development Manager, March 2015 – June 2018
- Tidewater Community College, Humanities Department Contingent Faculty, August 2010 – Present
- Fleet & Family Support Center, Life Skills Educator, June 2009 – March 2015
- Virginia Supreme Court Certified Mentor Mediator, May 2001 – Present
- Community Mediation Center, Community Relations Director, May 2001 – May 2009

*Education*

- Master of Arts, Humanities, Old Dominion University, December 2007
- Bachelor of Science, Communication & Sociology, Old Dominion University, May 2002

*Select Presentations*

- Conference on Academic Research in Education, Las Vegans, NV
    - Exploring the novice and expert mindset of a first and last year doctoral student through self-study, February 2019
    - Exploring faculty development identity through self-study, February 2017
- Virginia Community College System Conferences, Roanoke & Wintergreen, VA
    - Online Open Module: Information Literacy for Early College Students, April 2018
    - Smart Course Design & Teaching: A Case Study in Practice, April 2017
    - The Habit of Retention, September 2016
    - Refreshing Teaching Philosophies Through Reflective Practice, April 2016

*Select Posters*

- Conference on Higher Education Pedagogy, Blacksburg, VA
    - Exploring doctoral student mindsets through critical friendship, February 2020
- Conference on Academic Research in Education, Las Vegans, NV
    - Faculty Senate Engagement and Motivation: An Appreciative Inquiry, February 2019

*Select Publications*

Gregory, K. H., Burbage, A. K. (2017). Exploring faculty development identity through self-study: Teaching philosophies, reflective practice, and critical friendship. *Journal of Ethnographic & Qualitative Research, 12*(2), 110-124.

Burbage, A. K., Gregory, K. H., Coyoy, J. (in press). Proficiency, self-efficacy, and advocacy: A leadership development co-mentoring model. In J. Surface, N. Aoudeh, & D. Donsky (Eds.), *Women in Educational Leadership*. Ontario, Canada: Word and Deed Publishing.