The Relationship between Faculty Diversity and Student Success in Public Community Colleges

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Abstract

Community colleges serve the most diverse student populations in higher education yet have some of the lowest levels of faculty diversity in higher education. Retaining community college student cohorts through transfer/graduation is a goal, yet attaining this goal has been elusive, particularly for underrepresented minority (URM) community college students. Few studies have explored the impact of faculty diversity on the successful retention of URM community college students. This study used archival data for 120 public community colleges from the Integrated Postsecondary Education Data System (IPEDS) to calculate a Diversity Score for each college and ranked them by their overall level of faculty racial/ethnic variance to quantify the relationship between faculty diversity and student graduation, transfer, and drop-out rates. The findings suggest that there is a significant strong positive relationship between graduation, transfer, and drop-out rates for URM students of all race/ethnic categories when there are increases in faculty diversity. Exposure to a diverse faculty produces different outcomes in URM students.

Keywords: diversity score, faculty diversity, student diversity, graduation, transfer, drop-out, community colleges, higher education, diversity, attrition, student success, completion, retention, students, underrepresented minority

Community colleges are often the most accessible point of entry to higher education, particularly for underrepresented minority (URM) students (Cohen et al., 2014; McFarland et al., 2017), yet community colleges experience a significant disparity in the retention and graduation of URM students in relation to non-URM students (Community College Research Center, 2017; Espinosa et al., 2019). The difference in graduation rates for students who began at two- institutions ranged from 48% for Black students to 65% for Asian students, with a similar graduation rate for Latinx and White students (58%), but all two-year students graduated at a 20 to 25% lower rate than their peers in four-year institutions (McFarland, et al., 2017). Research has shown faculty racial/ethnic diversity in higher education contributes to the development of essential skills students need for success (Hurtado & Guillermo-Wann, 2013; Levin et al., 2014; Office of Planning, Evaluation and Policy Development, 2016; Tovar, 2014), but faculty racial/ethnic diversity in community colleges is significantly lower than in four-year intitutions (Stout et al., 2018). Increasing faculty diversity may be one strategy to increase URM student retention and graduation rates in community colleges.

Student Retention and Attrition

Students from low- and middle-income families, students of color, international students, English language learners, and other special populations often find barriers in gaining access to and persevering in their college programs until graduation (Cohen et al., 2014; Hurtado & Guillermo-Wann, 2013; Espinosa et al., 2019). Research reports that this is particularly true for URM students at predominantly White institutions (McClain & Perry, 2017). Student attrition is one of the most widely studied areas across higher

education (Tinto, 2006; McClain & Perry, 2017; Quaye et al., 2015), with findings suggesting campus environments with opportunities for developmental and academic growth increase student success, leading to higher graduation rates (Hurtado & Guillermo-Wann, 2013; Quaye et al., 2015; Scrivener, et al., 2015). Tinto (1993) highlighted the significance of essential transitional benchmarks including opportunities for development and academic progress in developing Institutional Integration Theory. Informal interaction with both fellow students and faculty appeared to significantly influence institutional integration, positively impacting student graduation rates (Tinto, 1982, p. 172). Faculty positively impacted successful student environmental integration and effectively reduced student feelings of isolation and rejection by interacting with students, sponsoring diverse student events and activities and even eating in student dining areas. Multiple researchers, including Museus (2014), have expressed concerns regarding Tinto's (1975; 1993) Interactionalist model, noting the foundations of the theory are biased and do not consider the importance of representation and culture in URM student validation. Museus suggests the Interactionalist model disproportionately disadvantages students of color who are more likely to come from cultures and communities different from those found on college campuses (2014). Research addressing the relevance of Institutional Integration Theory is mixed with regard to two-year college student degree completion (Crisp, 2010).

URM Students' Experience of College

The U.S. Office of Planning, Evaluation and Policy Development (USOPEPD) reported while higher education is a key pathway for social mobility in the United States,

the participation of URM students decreases at multiple points across the higher education pipeline (Office of Planning, Evaluation and Policy Development, 2016). Students of color and other underrepresented groups typically experience lower enrollment and graduation rates than students who are White and are also more likely to be first-generation college students, come from families with a lower socioeconomic status and be English language Learners. (Washington Student Achievement Council, 2013; Kirsch et al., 2007; McClain & Perry, 2017). Many predominately White institutions (PWI) are not experiencing success in retaining and graduating students of color (Zaback et al., 2016; U.S. Department of Education, 2015). Although institutions may strive to be inclusive, many still experience high drop-out and transfer rates among students of color, although minority-serving institutions have higher graduation rates for their URM students than the federal graduation rate (Espinosa et al., 2017). Campus racial climate contributes to the retention of students within a college and students representing different races/ethnicities experience campus climate differently (Hurtado & Guillermo-Wann, 2013). URM students report and perceive that they receive lower levels of academic and interpersonal validation than White students and Black students report experiencing hostile climates more frequently (Cervantes et al., 2017; Hurtado & Guillermo-Wann, 2013). Hurtado and Guillermo-Wann (2013) also report that Asian and multiracial-identifying students (Two or More Races) indicate higher frequencies of discrimination and bias than some racial groups, dispelling the common assumption that multiracial students experience less discriminatory treatment on campus (Hurtado & Guillermo-Wann, 2013). White students who attended a majority White college were

less likely to report experiences of negative racial climates or racial/ethnic discrimination from faculty than their fellow students of color (Nora & Cabrera, 1996). In a study of 10 colleges, students of color experienced their campuses as more racist and less tolerant than their White peers (Rankin and Reason, 2005).

Theoretical Framework around Campus Racial Climate

Campus racial climate can affect student success for all students (Cervantes et al., 2017; Bowen & Bok, 1998; Tovar, 2014; Hurtado et al., 2008). The Culturally Engaging Campus Environment (CECE) model (Museus, 2014) addresses the reality that students of color face racial/ethnic disparities in college persistence and graduation. The model posits undergraduate students who experience a more culturally engaging college campus environment are more likely to exhibit a greater sense of belonging, higher levels of academic performance, and are ultimately more likely to persist in graduation. This model measures diversity and equity on college campuses using two categories, cultural relevance and cultural responsiveness (Wexler, 2016; Museus, 2014). The first category, cultural relevance, addresses how well the atmosphere of a college campus reflects a student's background. The second category, cultural responsiveness, gauges how different support systems on a college campus respond to diverse student needs. The CECE model may prove to be a useful model for higher education leaders to better understand ways in which their college environments influence the experiences and outcomes of their diverse student body (Museus, 2014).

The Multi-contextual Model for Diverse Learning Environments (MMDLE) takes into account the nature of literacies, learning, and technologies and how these intersect in

student lives as learners (Jones & Lea, 2008). In this model, students interact in a dynamic relationship with both faculty and staff, which provides opportunities for both faculty and staff to positively engage students through practices that involve content (educational programming) and process (pedagogies and practice). This framework expands upon previous student success frameworks by including all stakeholders (faculty, staff, students, administration, community) involved in the educational environment and expands upon the complexities of a campus climate to include the variety of voices available (Hurtado et al., 2012). In the MMDLE model, campus racial climate is shaped by "the current beliefs, judgments, and outlooks within an academic society about race, ethnicity, and diversity" (McClain & Perry, 2017, p. 2). Hurtado et al. (1999) identified four major components of campus racial climate: "(1) Institutional historical legacy of inclusion or exclusion, (2) Compositional diversity, (3) Psychological climate, (4) Behavioral climate" (McClain & Perry, 2017, p.2). A fifth component, Structural Diversity, was later added by Milem et al. (2004). The component of the MMDLE model most applicable to our research is compositional diversity, which pertains to the quantity and visibility of URM students, staff, and faculty visible on the college campus (Quaye et al., 2015). Quaye et al. (2015) suggest any effort to increase the representation of students, faculty, and staff from URM races/ethnicities can improve a college's compositional diversity. Since URM faculty can be seen as role models and a source of security and acceptance for URM students, a lack of representation and therefore a lower compositional diversity can negatively impact student retention (Quaye et al., 2015). Campus climate can be a major factor affecting student achievement

including outcomes such as retention and graduation rates (Hurtado et al., 2012; Hurtado et al., 1999). The MMDLE suggests that increasing faculty diversity may help create a positive organizational climate leading to more favorable student outcomes (Hurtado et al., 2012).

URM Faculty in Community Colleges

Although an increase in faculty diversity has been theoretically linked to positive student outcomes, NCES reported the total of all URM faculty race/ethnicity categories together represented less than 21% of total postsecondary faculty (both 2- and 4-year) in 2015 (NCES, 2017). While community colleges have greater student racial/ethnic diversity than four-year institutions they also have less faculty diversity than those same institutions (Stout et al., 2018; Robinson et al., 2013; Office of Planning, Evaluation and Policy Development, 2016; Espinosa et al., 2019). Wellington-Baker (2020) explored changes in community college faculty diversity in Washington State over a 10-year period from 2008 to 2018 and found virtually no increase in diversity among both full- and part-time faculty during the period explored. In fact, during the studied time period, 24% of institutions decreased in diversity among part-time faculty and 12% decreased in the diversity of their full-time faculty. This dearth of diversity in faculty can have multiple negative effects on community college campuses. Along with providing a more inclusive campus climate, URM faculty bring a diversity in viewpoint to the community colleges they serve (Abdul-Raheem, 2016). Levin et al. (2014) examined ways in which community college faculty of color construct understandings of institutional culture and found faculty of color saw the community college workplace from a different perspective

than White faculty. URM faculty viewed the community college as comprised of divided professional worlds where they felt subordinated to the White faculty, contributing to the fact their social and cultural identities were suppressed (Levin et al., 2014).

Measuring Diversity

Understanding and measuring a problem is often the recommended first step in discovering its solution. Franklin (2012) conducted a study combining data from NCES with population data from the U.S. Census Bureau to provide a diversity comparison for state universities. Franklin created a diversity statistic from the comparison of the data that would enable cross-comparison of higher education institutions, then conducted an analysis regarding university student populations compared to the population (state population) the university was originally intended to serve. The results indicated Black and Latinx groups were significantly under-represented in public, four-year colleges in the United States when compared to the university's regional race and ethnic diversity. Franklin noted that Black and Latinx students are underrepresented in four-year universities and community colleges benefit regional populations by absorbing some of the URM student population excluded from four-year institutions (2012).

Prior to 2018 there was little research published to address the impact of faculty racial/ethnic diversity on student graduation rates in any area of higher education. In 2018, Stout et al. calculated Diversity Scores for public colleges across the United States and used those scores to determine that the higher the variation of race and ethnic diversity of the faculty, the higher the student graduation rates were overall among all URM groups. All student racial/ethnic groups showed a significant positive relationship

with faculty members who were of their same ethnic group. Stout et al. (2018) suggested further research should be conducted using the Diversity Score to explore the impact of faculty diversity on additional student outcome measures. They also proposed that research should be conducted in different types of higher education institutions (HBCU, two- vs four-year) and regions (Stout et al., 2018). Since that article, a few additional studies have been conducted linking faculty diversity and student outcomes. Gilmore (2019) used the Diversity Score pioneered by Stout et al. (2018) to explore the relationship between a change in the diversity of faculty members and the completion/retention rates of URM students at their community colleges over a five-year period. The Diversity Score was applied to selected colleges that had experienced a significant change in the diversity of the faculty over a five-year period of time. Findings showed a significant positive correlation between the racial/ethnic diversity of faculty members and the completion/retention rates of URM students. Ogundu (2020) used a different measure, the Simpson Index scale, to quantify faculty and student diversity at two-year public colleges from three southern states and found a significant correlation between faculty diversity and student retention.

Purpose of the Present Study

The purpose of this research study was to extend the Stout et al. (2018) study by quantifying the relationship between faculty diversity and student graduation, transfer, and drop-out rates focusing on public community colleges through the following research questions:

1. Is there a difference between graduation, transfer, and drop-out rates of URM students and non-URM students in public community college?
2. To what degree is there diversity variation among community college faculty?
3. Is there a relationship between faculty diversity and student graduation rates in public community college?
4. Is there a relationship between faculty diversity and student transfer rates in public community college?
5. Is there a relationship between faculty diversity and student drop-out rates in public community colleges?

Materials and Methods

Population and Sample

The population researched in this study was public community colleges within the United States boundaries and territories, including colleges offering two-year academic and vocational programs. Some colleges may have had three or four-year vocational programs such as nursing or industrial technology areas in addition to one and two-year programs. The community colleges were all publicly funded and accepted federal financial assistance. Community colleges included ranged in size and urbanicity, serving large and small student populations in urban and rural settings.

Data was drawn from publicly available archival data collected and stored in IPEDS. IPEDS gathers information from every degree granting college, university, technical, and vocational program receiving federal financial aid funding, collecting

enrollment, faculty, student, and administrative data including student graduation, transfer and drop-out rates from its member institutions (McFarland, et al., 2017).

The five variables examined in this study were: (1) Faculty race/ethnic diversity; (2) Student race/ethnic diversity; (3) Student graduation rates; (4) Student transfer rates; and (5) Student drop-out rates. Student and faculty race/ethnicity refer to race/ethnicity data from established categories defined by the United States Department of Education. These categories are: (1) Non-resident Alien; (2) Latinx; (3) American Indian or Alaska Native; (4) Asian; (5) Black; (6) Native Hawaiian or other Pacific Islander; (7) White; (8) Two or More Races; or (9) Race or Ethnicity Unknown. This research did not address the categories of Non-resident Alien, Two or More Races, or Race or Ethnicity Unknown due to their low frequencies in the dataset.

The demographic/independent variables used in this study were faculty and student race/ethnicity. The academic/dependent variables used were graduation, transfer, and drop-out rates. Graduation was defined as completion of the academic or vocational program within 150% of continuous enrollment (three years). Diversity was defined as racial/ethnic variance using racial categories accepted by the U.S. Department of Education and used by IPEDS.

We sampled 120 two-year public, degree-granting community colleges from eight of the nine IPEDS geographical reporting regions using stratified random sampling. The nine regions used by IPEDS are listed on Table 1.

INSERT TABLE 1 HERE

Data submitted to IPEDS by the participant colleges for the 2017 academic year (the most recent academic year for which data was available) was used. The purpose of this sampling method was to select colleges representative of the broad national spectrum of public community colleges to increase the generalizability of the findings. To narrow the sample, selected colleges had the words 'Community College' as part of their official title. No schools were sampled from the Outlying Areas region. Five of the randomly selected community colleges did not report transfer rates, and were eliminated from this sample and an alternative school from the same IPEDS region was randomly selected and substituted. Institutions chosen for this sample ranged from colleges within large multi-campus/multi-college systems to small single campus colleges. The range of faculty per campus was from 5 to 579 with a mean of 123.1 (d = 8.6) faculty members per campus. Campus locations ranged from large, urban, downtown locations to rural and small-town colleges. Table 2 provides additional information about the faculty sample.

INSERT TABLE 2 HERE

The range of students per college was from 11 to 4603 with a mean of 819.3 (d = 738.3) students per campus. Table 3 provides additional information about the student sample.

INSERT TABLE 3 HERE

Data Collection

We explored IPEDS to determine the number of qualifying schools (n = 1438). Data was then extracted from IPEDS, and institutions which were missing data were contacted to obtain accurate information. Any college that still had incomplete or missing

data was removed from the sample and another randomly drawn college from the same geographical region was used. IPEDS was queried again to collect faculty and student race/ethnicity data and student graduation, transfer, and drop-out rate data.

This study used IPEDS existing classifications established for postsecondary schools. We employed a broad category of URM covering all persons of color currently underrepresented as faculty members (Taylor et al., 2010) including faculty who identify as Black, Latinx, Asian, Native Hawaiian/Pacific Islander, and American Indian/Alaska Native. For examining statistical difference, the racial categories of students were merged into URM (n= 28,792) and non-URM (n= 54,653) categorical breakdown and then disaggregated for later analyses.

Data Analysis

Data was collected from IPEDS then cleaned, computed, and analyzed using SPSS software. To ensure that the sample was representative, the first research question was explored to test the validity of the sampling procedure, similar to Stout et al. (2018). Nation-wide, non-URM students graduate at a higher rate than URM students (Espinosa et al., 2019; Community College Research Center, 2017; Aud et al., 2011). As such, if our stratified random sampling was accurate, we should have found similar differences in our data between URM and non-URM students.

Research question one was examined by computing the percentages of student racial/ethnic groups within each college to establish a mean score. Paired sample *t*-tests were used to evaluate if there was a difference between the graduation, transfer, and drop-out rates of URM and non-URM students.

Research question two was explored by creating a Diversity Score for each college used in the sample showing their degree of overall faculty ethnic/racial diversity. The Diversity Score was created using the same steps as Stout et al. (2018):

> First, the percentage of faculty in each ethnic group was calculated by dividing the number of faculty in each group by the total number of faculty at each institution. Using percentages allows us to account for differences in school size between institutions. Once percentages had been calculated, the standard deviation of faculty percentages was calculated for each institution. This tells us on average how much the faculty percentages differ across ethnic/racial groups within each institution. In order for the Diversity Score to be more readily interpretable, we then took the calculated standard deviation away from one and multiplied the result by 100, rounding to the nearest whole number, resulting in a possible range of Diversity Scores from 55 to 100. (p. 406)

To answer questions three, four, and five the faculty Diversity Score was used to determine if there was a relationship between faculty race and ethnic diversity and student graduation, transfer and drop-out rates. The number of students in each race and ethic group at each institution was converted to a percentage to account for differences in school size. Pearson product-moment correlations were run to examine the relationships between the Diversity Scores and student graduation, transfer and drop-out rates. A significance value of .05 was used for this study.

Results

Question one explored whether the mean difference rates between non-URM students and URM students differed significantly from zero. The results indicate significant differences between URM and non-URM students on all three outcome variables (graduation, transfer, and drop-out). URM students experienced significantly lower graduation, transfer, and drop-out rates than their non-URM counterparts. Table 4 displays the results of the paired sample *t*-tests.

INSERT TABLE 4 HERE

Question two explored the degree of diversity variation among community college faculty. The Diversity Score shows the distribution of faculty diversity by ethnicity within each community college in the sample. Higher Diversity Scores are earned by community colleges which have a more equal distribution of faculty across the six racial/ethnic groups. The range of the racial/ethnic Diversity Scores in this sample was 59 to 89, with a mean of 66.06 (SD = 5.44) across all institutions.

Correlations Between Diversity Score and Student Outcomes

To address questions three through five the number of graduates in each ethnic/racial group at each community college were first converted to a percentage to account for differences in school size.

Diversity Score and Graduation Rate

A Pearson product-moment correlation was run to examine the overall relationship between URM faculty and URM graduates. The result was a strong positive relationship $r = .79$, $p < .01$. Multiple correlations were then run to explore the overall relationship between the Diversity Score and student graduation rates after disaggregating

faculty race/ethnicity. Correlations ranged from $r = .14$ to $r = .78$. Six of the correlations were statistically significant at $p \leq .01$. All the correlations were positive except for the relationship between Diversity Score and percentage of White graduates.

Diversity Score and Transfer Rate

A Pearson product-moment correlation was run to examine the overall relationship between URM faculty and URM transfers. The result was a strong and positive relationship $r = .74$, $p < .01$. Multiple correlations were then run to explore the overall relationship between the Diversity Score and student transfer rates after disaggregating faculty race/ethnicity. Correlations ranged from $r = .21$ to $r = .71$. All seven of the correlations were statistically significant at $p \leq .05$ and six were statistically significant at $p \leq .01$. All the correlations were positive except for the relationship between Diversity Score and percentage of White transfers.

Diversity Score and Drop-out Rate

A Pearson product-moment correlation was run to examine the overall relationship between URM faculty and URM drop-outs. The result was a strong and positive relationship $r = .75$, $p < .01$. Multiple correlations were then run to explore the overall relationship between the Diversity Score and student drop-out rates after disaggregating faculty race/ethnicity. Significant correlations ranged from $r = .23$ to $r = .77$. Six of the correlations were statistically significant at $p \leq .01$. All the correlations were positive with the exception of the relationship between Diversity Score and percentage of White drop-outs.

Table 5 displays all the correlations and *p* values for the correlation analyses.

INSERT TABLE 5 HERE

Correlations Between Faculty Race/Ethnicity, Student Race/Ethnicity, and Student Outcomes

In order to explore the relationships between faculty diversity and student outcomes at a more granular level, both faculty race/ethnicity and student race/ethnicity were disaggregated into separate racial/ethnic groups. The relationships between these groups and their effects on graduation, transfer, and drop-out rates were then explored in multiple correlations.

Faculty Race/Ethnicity and Graduation Rate by Student Race/Ethnicity

The first correlation examined the relationships between percentages of faculty of each racial/ethnic group and student graduation rate by ethnicity/race. The magnitude of the significant correlations ranged from $r = .21$ to $r = .92$. Results of the Pearson product-moment correlations test showed statistically significant relationships between 20 of the 36 correlations with at least $p < .05$. Table 6 displays the results of the correlation matrix analysis. All of the racial/ethnic graduation rates showed the highest strong and positive correlation with the faculty who were of their own racial/ethnic group with the exception of the Native Hawaiian/Pacific Islanders, who showed the highest correlation rate with Asian Faculty $r = 37$, $p < .01$.

INSERT TABLE 6 HERE

Faculty Race/Ethnicity and Transfer Rate by Student Race/Ethnicity

A correlation matrix was constructed to examine the relationships between percentages of faculty of each ethnic/racial group and student transfer rate by

ethnicity/race. Pearson product-moment correlations showed statistically significant relationships between 21of the 36 correlations with at least $p < .05$. The magnitude of the significant correlations ranged from $r = .24$ to $r = .91$. Table 7 displays the results of the correlation matrix analysis. Five racial/ethnic group transfer rates showed the highest strong and positive correlation with the faculty who were of their own ethnic/racial group. The Native Hawaiian/ Pacific Islander group showed the same relation with Asian faculty as with Native Hawaiian/ Pacific Islander faculty $r = .69$, $p < .01$.

INSERT TABLE 7 HERE

Faculty Race/Ethnicity and Drop-out Rate by Student Race/Ethnicity

A correlation matrix was constructed to explore the relationships between percentages of faculty of each ethnic/racial group and student drop-out rate by ethnicity/race. The magnitude of the significant correlations ranged from $r = .25$ to $r = .91$. Pearson correlations showed statistically significant relationships between 20 of the 36 correlations with at least $p < .05$. Table 8 displays the results of the correlation matrix analysis. All racial/ethnic drop-out rates showed the highest strong and positive correlation with the faculty who were of their own ethnic/racial group.

INSERT TABLE 8 HERE

Discussion

The researchers found that non-URM students used for this sample ($n = 55,443$) graduate at a significantly higher percentage rate than URM students ($n = 36,250$). This finding was expected and supports the findings of previous research which highlights the significant gaps between URM and non-URM graduation rates (Espinosa et al., 2019;

Aud et al., 2011; McFarland et al., 2017; NCES, 2017; Stout et al., 2018). Non-URM students used for this sample transfer to another institution of higher education at a significantly higher percentage than URM students. This finding was also expected based on previous literature. IPEDs defines transfer as moving from one postsecondary institution to another. A transfer to another school is an indicator that students are still progressing through their educational goals. This study also found that non-URM students used for this sample drop-out at a significantly higher percentage than URM students. The researchers did not expect to find non-URM graduates drop-out at a higher percentage rate than URM students, which may indicate the presence of a statistical moderator such as location or population that may be buffering or decreasing the effect of the independent variable on the outcome. This effect warrants additional investigation. Overall, these results are in line with national-level findings, providing greater confidence our stratified sample was representative, valid, and suitable for use in the remaining portions of our analysis.

Stout et al. (2018) reported being surprised by the lack of faculty diversity found in many institutions of higher education. Three of the colleges in their study reported having no faculty of color. Many colleges, particularly from smaller rural areas, reported having two or fewer URM faculty. Similar findings emerged in this study of public community colleges. Six community colleges (5%) in this sample reported having no URM faculty on their staff while another 20 (15%) reported having only one URM full time faculty member. Thirty-two community colleges (26.7%) reported that they have no Latinx faculty, while only one (.8%) reported having no Latinx students. The lack of Latinx male faculty is alarming with 53 (44.2%) of the colleges reporting having none. Also alarming is that half (50%) of the community colleges surveyed reported having only one or no Black faculty members in their ranks. Most community colleges (n = 94,

78.3%) reported having no American Indian/Alaska Native faculty. Given the low numbers of URM faculty at the community colleges sampled, according to the compositional diversity component of the MMDLE we would expect URM students at the sampled community colleges to experience a less supportive campus racial climate than they might have experienced at campuses with higher faculty diversity.

As expected, a strong positive relationship was found between graduation and transfer rates of Latinx, Asian, American Indian/Alaska Native and Black students and overall faculty diversity as measured by the Diversity Score while strong negative relationships were found between overall faculty race/ethnic diversity and White student graduation, transfer, and drop-out rates. This result was expected and is consistent with results found by Stout et al. (2018) and Gilmore (2019). Similar to Stout et al. (2018), this result suggests community colleges with high percentages of non-URM faculty may have a negative influence on graduation, transfer, and drop-out rates of their URM students while community colleges with high percentages of URM faculty may have a negative effect on graduation, transfer, and drop-out rates of non-URM students. Increases in any one racial/ethnic group's percentage will result in a decrease in the percentage of all other groups within the institution due to the proportionality of percentage data. As would be expected through the MMDLE and CECE models, as proportional representation of a group is diminished, members of that group experience a less culturally engaging campus through lower compositional diversity. The advantages gained by non-URM students attending a community college with high percentages of non-URM faculty will be reduced as their faculty reach a more proportional diversity, potentially having adverse effects on that group's graduation, transfer, and drop-out rates. Using best practices to increase faculty diversity so that it is proportional with the student population should result in greater student success while disadvantaging the fewest

students, as every student racial/ethnic group would be able to experience representation in proportion to their group's size.

When disaggregated by faculty race/ethnicity, student graduation, transfer, and drop-out rates were most strongly related to the percentage of faculty at their institution of the same race/ethnicity. As was found in Stout et al. (2018), having a high percentage of URM faculty was significantly related to higher URM student graduation, transfer, and drop-out rates, even if the URM students were not the same race/ethnicity as the URM faculty members. When there was a low percentage of URM faculty, all race/ethnic student groups had lower graduation, transfer, and drop-out rates except for non-URM students. This study supports earlier research suggesting that a lack of faculty diversity can be a barrier to the academic progress (Stout et al., 2018; Hurtado & Guillermo-Wann, 2013) and suggests that more diverse faculty leads to a more culturally enriched campus environment for all URM students, regardless of specific racial/ethnic group.

Limitations

There are several limitations to this study to be considered. Differences in state laws, enrollment, and classifications of student success may limit the ability to generalize from a sample across the United States community college spectrum. Restricting the definition of diversity to race/ethnicity excludes such factors as gender and socioeconomic status that might have generated different results. Data was collected from IPEDS for a single reporting year preventing the examination of cumulative data to address changes in community colleges over time. Not using IPEDS classifications such as Non-resident Alien, Two or More Races, and Unidentified in this study prohibits the generalizability of its findings to these groups.

This is a correlational study. The primary limitation of correlational research is that it limits the ability to validly discuss causes and effects. This research can only

validly discuss the statistical significance, strength, and direction of the relationships between faculty diversity and student graduation rates and cannot draw definitive conclusions regarding causes and effects.

The relationship between the Diversity Score and Native Hawaiian and Pacific Islander graduates was not significant with a correlation of $r = .144$ and a p value of .116. This finding may have been due to a small sample size for this group. Unexpectedly, Native Hawaiian/Pacific Islanders showed the highest correlation with Asian faculty. This may have been due to a small sample size or it may have been due to similarities in racial/ethnic cultures that have been in close proximity for centuries. There is little research available to understand this phenomenon at this time and additional investigation is warranted.

Implications for Future Research

The Diversity Score has proven to be a valuable tool measuring faculty diversity and its effect on student success in the college setting (Gilmore, 2019; Stout et al., 2018). Further study of the Diversity Score on other populations such as low socioeconomic status students and intersectional diversity categories like Black men, Latinx women, and other combinations may provide a deeper analytical understanding of the effects of faculty diversity on community college students. This study could be replicated in other sectors of education to include K-12 programs and other types of postsecondary programs. Additional research is also recommended into the possible presence of an unidentified moderating variable which may limit accuracy of the Diversity Score as a rating tool. To test moderation, an investigator could use hierarchical multiple regression to look at the interaction effect between the independent variable which in the case of this research was faculty diversity and whether or not the effects are significant in predicting the dependent variable which in this study was student success.

Implications for Practice

Research suggests that a racially and ethnically diverse student body can benefit from exposure to a racially and ethnically diverse faculty (Hurtado et al., 2012; Museus, 2014; Egalite & Kisida, 2016; Quaye et al., 2015). Stout et al. (2018) highlighted the positive impact of faculty diversity on minority and majority population graduation rates and showed an increased persistence in students at institutions with higher numbers of faculty who were of a similar race and ethnic background as their own. A sense of belonging appears to be an element of the learning environment that is necessary to support student success for URM students (Museus, 2014; Tinto V. , 1993; Verschelden & Verschelden, 2017). The CECE Model takes a deep dive into the multi-layered complexities of a creating campus climate in higher education where the student population is diverse, transient and often underprepared. The findings of this study support the CECE framework.

If having a more diverse faculty leads to greater overall student success, then taking intentional strategic action to (a) create a diverse faculty body, (b) establish a culturally inclusive climate, and (c) remove barriers by building internal and external supports can improve community college student outcomes. The following strategies have been effectively used by many four-year universities and a few forward-thinking community colleges to recruit and retain a racial and ethnically diverse faculty:

- Establish a faculty diversity recruitment plan,
- Put in place a dedicated faculty diversity recruitment specialist,
- Advertise in diversity related publications and job boards,
- Establish mentor programs for diverse junior faculty,
- Create affinity or employee resource groups for employees.

The application process used by Insight into Diversity to select best practice colleges is a good tool for community college leaders to assess their current practices and identify others that may be more effective (Insight Into Diversity, 2017). Through whatever practice selected, increasing faculty diversity can produce positive effects throughout the community college campus community, including increasing student success.

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Table 1

IPEDS Regions and States Included in Each Region

IPEDS Region – State ID
New England: CT, ME, MA, NH, RI, VT
Mid-East: DE, DC, MD, NJ, NY, PA
Great Lakes: IL, IN, MI, OH, WI
Plains: IA, KS, MN, MO, NE, NS, SD
Southeast: AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV
Southwest: AZ, NM, OK, TX
Rocky Mountains: CO, ID, MT, UT, WY
Far West: AK, CA, HI, NV, OR, WA
Outlying Areas: AS,FM,GU,MH,MP,PR,PW,VI

Table 2

Descriptive Statistics for the Faculty Sample

	Faculty Total	Latinx	American Indian/Alaska Native	Asian	Black	Native Hawaiian/ Pacific Islander	White
Minimum	5	0	0	0	0	0	4
Maximum	579	65	17	56	94	17	462
Mean	123.10	5.55	.68	4.65	9.00	.24	101.39
Median	87.00	1.50	.00	2.00	3.00	.00	73.00
Std. Dev.	107.41	11.68	1.78	8.41	16.28	1.59	84.23

Table 3

Descriptive Statistics for the Student Sample

	Student Total	Latinx	American Indian/Alaska Native	Asian	Black	Native Hawaiian/ Pacific Islander	White
Minimum	11	0	0	0	0	0	0
Maximum	4603	1368	214	348	883	42	2616
Mean	819.3	138.30	8.28	31.03	122.00	2.31	454.61
Median	521.5	39.50	3.00	8.00	56.50	1.00	346.00
Std. Dev.	738.33	213.18	24.71	56.16	176.37	6.48	406.66

Table 4

Results of Paired Sample t-test Between URM and Non-URM Student Outcomes

Outcome	$\bar{x}$	*s*	t	*d*
Graduation rate				
URM	52.08	82.34	7.52*	0.69
Non-URM	123.97	110.58		
Transfer rate				
URM	54.47	63.11	5.12*	0.47
Non-URM	87	84.88		
Drop-out rate				
URM	110.07	178.62	4.54*	0.41
Non-URM	182.86	178.62		

*$p<.05$.

Table 5

Correlations Between Diversity Score and Student Outcomes

Outcome	*r*	*p*
Graduation rate		
Overall URM	.78	.000
White	-.72	.000
Latinx	.38	.000
Asian	.44	.000
Native Hawaiian/Pacific Islander	.14	.116
American Indian/Alaska Native	.35	.000
Black	.54	.000
Transfer rate		
Overall URM	.71	.000
White	-.60	.000
Latinx	.37	.000
Asian	.38	.000
Native Hawaiian/Pacific Islander	.21	.020
American Indian/Alaska Native	.37	.000
Black	.31	.001
Drop-out rate		
Overall URM	.77	.000
White	-.76	.000
Latinx	.37	.000
Asian	.36	.000
Native Hawaiian/Pacific Islander	.23	.013
American Indian/Alaska Native	.35	.000
Black	.42	.000

Table 6

Correlations between Faculty Race/Ethnicity and Student Graduation Rate by Student Race/Ethnicity

	Student Race/Ethnicity					
Faculty Race/Ethnicity	Latinx	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black	White
Latinx	.61**	.46**	0.14	0.10	0.04	-.52**
American Indian/ Alaska Native	-0.00	.92**	0.00	-0.03	.21*	-.25**
Asian	0.12	0.07	.80**	.37**	0.03	-.39**
Native Hawaiian/ Pacific Islander	-0.04	.46**	.56**	.37**	0.08	-.29**
Black/ African American	-0.01	-0.05	0.04	-0.07	.84**	-.45**
White	-.28**	-.30**	-.41**	-0.16	-.65**	.70**

*$p < .05$. ** $p < .01$.

Table 7

Correlations between Faculty Race/Ethnicity and Student Transfer Rate by Student Race/Ethnicity

	Student Race/Ethnicity					
Faculty Race/Ethnicity	Latinx	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black	White
Latinx	.66**	.48**	.14	-.01	-.19*	-.40**
American Indian/Alaska Native	-.01	.91**	-.06	.03	-.10	-.24**
Asian	.14	.10	.65**	.69**	-.02	-.33**
Native Hawaiian/Pacific Islander	-.06	.48**	.39**	.69**	-.10	-.25**
Black	-.03	-.08	.08	-.08	.76**	-.42**
White	-.27**	-.32**	-.35**	-.24**	-.41**	.59**

*$p < .05$. ** $p < .01$.

Table 8

Correlations between Faculty Race/Ethnicity and Student Drop-Out Rate by Student Race/Ethnicity

	Student Race/Ethnicity					
Faculty Race/Ethnicity	Latinx	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Black	White
Latinx	.64**	.45**	.09	.02	-.16	-.50**
American Indian/Alaska Native	-.02	.91**	-.03	.04	-.12	-.25**
Asian	.15	.09	.77**	.74**	.01	-.40**
Native Hawaiian/Pacific Islander	-.06	.48**	.53**	.75**	-.11	-.28**
Black	-.03	-.08	.03	-.12	.86**	-.54**
White	-.26**	-.31**	-.34**	-.27**	-.50**	.74**

*$p < .05$. ** $p < .01$.