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Implications of a Health Careers Exploration Program for Minority Student Matriculation

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This is to certify that the doctoral study by

Angelica Christie

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and that any and all revisions required by
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MEd, Clemson University, 1998

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Project Study Submitted in Partial Fulfillment

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Abstract

Organizations that deliver programs to promote the entry of students from marginalized populations into the U.S. health workforce often struggle to demonstrate the effective achievement of outcomes, and face diminishing fiscal resources. This study was an empirical examination of the extent and manner that a statewide, precollege, health careers exploration program fostered the matriculation of underrepresented minority students into health degree education programs. Schneider and Stevenson's aligned ambitions framework provided the theoretical foundation. The research questions for this study examined the relationship between program participation and the successful health degree matriculation of racial minority students based on the extent of participation, the type of participation, and the extent and type of participation controlling for gender, profession, and region using a quantitative trend analysis of archived program data and longitudinal, preexisting matriculation data. Completion of the analysis used sequential logistic regression. The selection criteria for study included high school students who participated in the program between 2006 to 2010 and who subsequently enrolled in college (N = 246). No statistically significant relationships between program participation and matriculation into health care education programs were found resulting in the recommendation to reassess and revise data collection and analysis processes for future official program evaluation. The resulting white paper recommends that Area Health Education Consortium (AHEC) career exploration program designers create continuous and effective review and evaluation processes to ultimately enable the positive social impact of a more representative number of students from marginalized populations into the U.S. health workforce.

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Dedication

I devote the efforts of this research to those who work tirelessly for the development of policy, programs, procedures, and services that promote equitable access to educational opportunity for the underrepresented and underserved. I dedicate this humble work in the spirit of diversity, the elimination of disparity, and the resilience that motivates the marginalized.

In honor of my mother, role model, and friend, Shirley Gardner Ellman, for always believing that I could, knowing that I would, and encouraging me to be an instrument for change, and to make a difference in my part of the world. For my children, Errol and Ehren Williams, who allowed me the time, without complaint, and the space needed to meet the demands of doctoral study; and to my husband, André Christie, for loving me through each step of this amazing journey.

In memory of Ida Spruill, DNP, RN for her encouragement and advisement to keep it simple.

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Honoring Jesus as my strength, shield and salvation, I wish to thank the members of my doctoral committee. Kerry Burner, PhD, and Shereeza Mohammed, PhD, thank you for serving as members of my committee and lending your proficiency to my success. I extend the highest regard to Jennifer Keeley, PhD, my committee chair, for the generosity of your expertise and the countless hours of reading, reflection, encouragement, and patience that were essential throughout this process.

I acknowledge the support of the South Carolina AHEC for allowing the review and analyses of data to support the development of this research project study, for valuing its results, and for allowing me to work within my passion. A special salute to Deborah Carson, Pharm.D. for your professional mentorship and endless encouragement.

I further acknowledge my extended family for establishing the pursuit of academic and professional excellence as the standard rather than the exception. Rosalind Bryant (Rozie), thank you for continuously girding my resilience, and challenging me to tap into hidden talents and skills. Thank you, Roberta Timmons (Auntie Ro), for reminding me of my inner lioness through the rough times. To my god dad, Owen Perkins (Uncle Owen), thank you for helping to ensure a bridge for every gap.

Never last or least, I thank you, Errol and Ehren, for being my heartbeats, my drive, and my purpose. Momma, these words only begin to acknowledge my appreciation of the unconditional love, unmatched guidance, and unwavering support that you pour into my life each moment of every day. André, my husband and friend, thank you for being the love of my life, and always seeing the best in who I am, and envisioning the best of who I can be. I love you all - a bushel and a peck.

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Section 1: The Problem

The Local Problem

There is an underrepresentation of racial minorities among health care professionals. While racial minorities account for over 22.3% of the U.S. population (U.S. Census Bureau, 2015), they represent less than 10% of the nation's physician workforce and only 8% and 5% of the nursing and dental workforce, respectively (Deas et al, 2010; Harris, Lewis, & Margaret, 2012). An aging population has placed an increased demand on the number of health professionals required within the U.S. health care workforce to meet the health care needs of the population. According to census and workforce estimates, there will be unprecedented need for a more racially and ethnically diverse health professions workforce that mirrors the increasing size of racial and ethnic minority populations in the United States (Deas et al., 2010; Harris et al., 2012). These data demonstrate the need to address racial and ethnic disparities within the U.S. health care workforce to meet the health care needs of an older and more diverse population (Deas et al., 2010; Harris et al., 2012).

The South Carolina Area Health Education Consortium (AHEC) is a statewide organization designed to address health care workforce needs through education. The AHEC addresses workers' needs by providing education starting at the elementary school level and extending into health care workplace settings (South Carolina AHEC, n.d.). AHEC staff developed the Health Careers Program (HCP), a program designed to address the lack of diversity within the health care field (South Carolina AHEC, n.d.). The HCP promotes racial diversity in the health care professions by sponsoring health

care career programs and health care activities in K-12 public schools throughout the state (South Carolina AHEC, n.d.). It also sponsors health career exploration studies in middle schools and in prehealth education preparation programs at the high school and postsecondary education levels (South Carolina AHEC, n.d.).

The Health Careers Academy (HCA) is an intervention program developed by HCP staff to prepare underrepresented minority (URM) high school students to pursue health care professions. The HCA program prepares URM students for prehealth (undergraduate), health education programs, and subsequent careers (South Carolina AHEC, n.d.). The HCA uses a 4-year, academic-based curriculum to demonstrate to students the relevance of academic concepts within health professions and deepen the health career exploration experience (South Carolina AHEC, n.d.). Per Deborah Carson, the organization's associate director of education, HCA activities include service learning, mentoring, role modeling, parental involvement, and shadowing activities intended to complement curriculum instruction (personal communication, August 29, 2014). The overarching goal of the HCA is to foster the successful matriculation of URM students into health care degree programs and the subsequent entry of students into health care professions (South Carolina AHEC, n.d.).

Although the HCA program has been in place since 2002, empirical research is lacking on outcomes related to program goals related to URM students and health care degree programs and workforce entry, based upon a review of available literature. HCA programmers track the extent and type of student participation in the HCA program. Government and workforce databases, such as the South Carolina Labor, Licensing and

Regulation (LLR) Board, Commission of Higher Education (CHE), include information on the extent to which program participants matriculate into health care degree programs and into the health care profession. These data, however, have not undergone an empirical examination to assess the extent and manner in which the HCA program may foster the successful matriculation of URM students into the health care workforce.

The South Carolina AHEC HCP relies on government funding to support HCA infrastructure. In 2011 the HCP received approximately $330,000 in government funding (Christie & Dubose-Morris, 2011). Of this amount, the state provided 69% of the funds, local sources provided 17%, and the National AHEC Organization allocated 14% of federal funding (NAO; Christie & Dubose-Morris, 2011). Because of government accountability measures for state spending (Evans et al., 2014) and increased competitiveness for state and local funding (D. Caron, personal communication, March 15, 2015), an assessment of the extent and type of HCA program participation would to aid in determining how well the program fosters the preparation of URM students for entry into health care degree programs. Determining "if" and "how" the HCA program affects the attainment of population parity within the health care workforce will aid AHEC staff to be more effectual in program development and delivery, and more efficient as fiduciary agents of federal, state, and local funding.

Extended learning opportunity (ELO) and enrichment programs may have some potential to address the disparity of URM in the health care field (Evans et al., 2014). However, funding is a primary barrier to the success of health professions pipeline programs such as these (Evans et al, 2014). Budget cuts to national, state, and private

funding sources and increased funding competitiveness threaten the continuation of precollege health care career pipeline programs (Evans et al., 2014). The national executive budget proposed for fiscal year 2016 (Obama, n.d.) eliminated funding for the NAO. The NAO provides revenue to support state initiatives designed to expand the health care workforce and maximize the diversity and distribution of primary care professionals, specifically in underserved communities (NAO, 2013).

Historically, federal, state, and private funds were available through legislative budgets and foundations to support pipeline and enrichment programs to address the lack of diversity within health professions (McGee & Fraber, 2012). Due to 2010 federal policies, documentation and reporting of evidence-based outcomes is now required as eligibility to secure funding for many social programs (Haskins and Margolis, 2014). As McGee and Fraber (2009) noted, providing evidence-based outcomes is a challenge for many programs because of a lack of regular and systematic data collection. Such data are necessary to evaluate the success of pipeline program and increase in the supply of URM health professionals (McGee & Fraber, 2012).

Rationale

Health inequities persist due to several social determinants, including race, ethnicity, gender, geography, and culture (Walters et al., 2016). Using an integrated microsimulation model, Health Resources and Services Administration (HRSA) researchers identified a primary care practitioner shortage of 18% in South Carolina 2025 (Steeter et al, 2017). Streeter et al (2017) projected a pervasive shortage of primary care practitioners to occur by 2025. Available data demonstrate the negative effect that racial

and ethnic imbalances within the healthcare workforce have on the quality and delivery of health care with marginalized populations being most adversely affected (Marrast et al, 2014). As racial and ethnic minority populations increase, there is a greater need to prepare members of underrepresented and underserved populations to work in the health care industry (Ricketts, 2011). The findings of researchers who indicate an increased probability of racial and ethnic minority practitioners to serve higher percentages of marginalized populations (Marrast et al., 2014) conceptually supports the positive effects of attaining racial and ethnic parity within the health care workforce in the state of South Carolina. Per its website, the NAO devotes resources to increasing the diversity and distribution of the health care workforce as a primary function of AHECs nationwide (http://www.nationalahec.org/programs/Health careersRecruitmentandPreparation.html). The overarching goal of the South Carolina AHEC HCA program is to foster the successful matriculation of URM students into health care degree programs and entry into health care professions (South Carolina AHEC, n.d.) in response to the health care workforce needs of South Carolina.

Because of the increased competitiveness needed to secure fiscal resources, AHEC needs to improve its ability to evaluate the effectiveness of the HCA (D. Carson, personal communication, March 16, 2015). The HRSA Bureau of Health Workforce provides federal funding to support AHEC programs throughout the United States (retrieved from https://bhw.hrsa.gov/fundingopportunities/?id=ccc4f09b-e51e-4541-988b-ddc2c7593760). The fiscal year 2017 funding opportunity announcement (FOA; HRSA-17-071, 2016) emphasized the “need for awardees to evaluate their programmatic

processes and outcomes" (p. i). A maximum 10% of each award can apply towards the implementation of health career programs that target high school grades. A maximum of 55 awards were awarded for the project period of September 1, 2017, through August 31, 2022 (HRSA-17-071, 2016). The competitive nature of this primary funding source requires the design and implementation of a more effective evaluation process for the assessment of HCA outcomes. The HRSA FOA provides an example of the emerging competitiveness for implementation funding, and the need for South Carolina AHEC to adequately and appropriately demonstrate the effectiveness of program efforts to prepare URM students for health professions education admission.

Project Study Purpose

The purpose of this study was to assess the extent and type of HCA program participation that may foster the successful matriculation of URM students through health care degree programs. I accessed archived program data to identify the type of program activities and duration of involvement among HCA program participants. Specifically, I analyzed program data to measure the extent and type of HCA program participation among URM high school students who had participated in the HCA program from 2006 to 2014. I conducted an examination of data received from the National Student Clearinghouse with respect to corresponding matriculation data. I conducted a trend analysis using sequential logistic regression procedures to assess the relationship between the type and extent of HCA program participation and the academic progression of URM participants into health professions education programs.

Definition of Terms

The following definitions provide readers with the terms, phrases, and acronyms I used in my investigation.

Area health education consortium (AHEC): A national network of organizations created to improve access to quality, primary and preventive care by increasing the supply and distribution of providers through educational and academic partnerships (National AHEC Organization, 2015).

Aspirations: A term that references the inspirations of goals and the potential for frustrations fundamentally conditioned by community and cultural based beliefs and customs (Genicot & Ray, 2014).

Ethnicity: Defined by the U.S. Census Bureau (2017) as being of Hispanic, Latino, or Spanish origin by descent regardless of race.

Extended learning opportunities (ELO): A broad range of programs that offer academic enrichment or supervised activity designed to promote learning outside of the traditional classroom (Smith et al, 2009).

Health care: Interchangeable with the term health care in referencing the delivery of medical services to improve health outcomes and quality of life (Roth & Stanley, 2002).

Health careers academy (HCA): The longitudinal program of the South Carolina AHEC designed to provide career exploration, academic and professional development opportunities for high school students (South Carolina AHEC, n.d.)

Health careers program (HCP): The parent program of the South Carolina AHEC HCA designed to increase the number of URM students who enter the state's health professions pipeline (South Carolina AHEC, n.d.).

Marginalized populations: A segment of the population excluded from, and devalued by the larger population (Marrast et al, 2014).

Pipeline programs: Career-specific, longitudinal programming for student development (Smith et al, 2009).

Primary care: A patient's main source for regular medical care (Carey et al, 2013).

Race: One of five minimum socially defined categories recognized by the U.S. Government – Black or African American, White, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander (U.S. Census Bureau, 2017).

*Social determinant*s: The circumstances in which people are born, grow up, live and work, and the systems put in place that influence the psychosocial, economic, and behavioral responses to situations (Smith et al, 2009).

Underrepresented minority (URM): The lack of representation of racial and ethnic populations within a defined subset of the population relative to their numbers in the general population (Salto et al, 2014).

Significance of the Study

The purpose of this study was to assess the extent and type of HCA program participation that may foster the successful matriculation of URM students into and through health care degree programs, resulting in progression into health care

professions. Results of this research may contribute to the persisting efforts of AHEC and other organizations to address the disparity of URMs who successfully prepare to enter health care professions. Results of this analysis seek to clarify the effectiveness of HCA program components and practices. The reporting of insights gleaned through this research to South Carolina AHEC seek to support and guide future program improvement efforts.

Research Questions and Hypotheses

The growing demand for health care in the United States, in conjunction with the continued increase in the size of ethnic minority populations, reinforces the need for diversity in the health care profession. Aurora et al (2011) reported that economic and educational impediments among URM populations can thwart the development of the skills, behaviors, and dispositions needed to successfully matriculate into health care degree programs. The design of the HCA program sought to aid program participants in overcoming many of these barriers, and, in turn, foster the successful academic progression of URM students into health care degree programs (Aurora et al, 2011). Although the HCA program has been well funded since its inception in 2002, it has not been assessed to formally determine the extent and manner that it fosters the entry of racial and ethnic minorities into health care degree programs, and ultimately the health care workforce. Decreased governmental funding and subsequent increases in fiscal competitiveness (Steeter et al, 2017) necessitates that HCA leaders more effectively assess programmatic outcomes for the allocation of resources in a manner that best facilitates intended goals to best substantiate needs, goals, and objectives in accordance

with funding requisites. Toward this end, I sought to address the following research questions:

RQ1. Is there a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among racial minority students?

RQ2. Is there a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among racial minority students?

RQ3. Is there a statistically significant relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students when controlling for (a) gender, (b) profession, and (c) region?

$H_0$1: There is not a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among racial minority students.

H_A1: There is a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among racial minority students.

$H_0$2: There is not a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among racial minority students.

H_A2: There is a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among racial minority students.

$H_0 3$: The relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students does not vary with respect to (a) gender, (b) profession, and (c) region.

$H_A 3$: The relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students does vary with respect to (a) gender, (b) profession, and (c) region.

In accordance with the guiding research questions and corresponding research hypotheses, the dependent variable of interest to this study is the matriculation status of students who participated in the HCA program from 2006 to 2010. The independent variable (IV) was the extent and type of HCA program participation. This study measured the extent and type of program participation via archived program data available to the researcher. This program data identified the type of program activities and duration of involvement of HCP program participants. I measured the matriculation status of HCA program participants through post-secondary health care degree programs and into health care professions using data retrieved via the National Student Clearinghouse database. The data, retrieved by the AHEC, is available for research and government reporting purposes adhering to human subject procedures and regulations. To test each null

hypothesis, I conducted an analysis of the archived program data and longitudinal matriculation data using sequential logistic regression analysis procedures to determine if the type and extent of HCA program participation statistically significantly correlated to the matriculation status of URM students.

Review of the Literature

This section begins with a synthesis of the aligned ambitions theory that provides the theoretical framework which guided the development this study. A thorough and in-depth overview of related literature and research studies follows.

Theoretical Foundation

The theory of aligned ambitions provided the theoretical foundation of this study. The theoretical value of aligning educational expectations with occupational goals emerged from a study conducted by Schneider and Stevenson (as cited by Sabates et al, 2011). The study findings determined that ambition, realistic or otherwise, have lifelong implications, and help to guide the academic and professional decisions of adolescents (Schneider & Stevenson, 2000). Meece et al (2013) used the Aligned Ambitions theory as the theoretical foundation of a study to determine that aspirations serve as the predictor of educational and profession attainment, and transitions during early adulthood. Similarly, Aurora et al (2011) found that contextual and attitudinal factors have a large impact on the career aspirations of youth. Aurora et al (2011) further noted that minority students' often lack career-specific knowledge and inability to exhibit realistic attitudes and successful attitudes propagates the racial disparities that exist within the health professions workforce (Aurora et al, 2011). The theory of Aligned Ambitions theory, as

presented by Schneider and Stevenson (2000), suggests that expectations of academic and professional achievements reflect how others influence thoughts and behaviors of adolescents. Correspondingly, the theory of Aligned Ambitions by Schneider and Stevenson (2000) provided the structural perspective for the assessment of the HCA program's ability to promote the preparation of URM students for academic progression. It offers a theoretical basis to aid in understanding "if" and "how" participation in the HCA influences high school students' achievement towards becoming health professionals.

As the theoretical framework of this study, the theory of Aligned Ambitions (Schneider & Stevenson, 2000) provided structure for guiding the approach to determine if a significant relationship exists between the type and extent of HCA participation and the successful matriculation of URM students' successful matriculation through health care education programs. The theory provided the lens by which this study conducted a retrospective longitudinal research design using archived program data and pre-existing student matriculation data allowed this study to track changes in the educational progression of high school students, who self-identified the intention to enter the health professions workforce, over a nine-year period; and assess occupational achievement in relation to that aspiration.

Review of the Broader Problem

Introduction

The following section presents an analytic review of the current research (i.e., 2009 to 2015) relevant to the focus of this study. I conducted a search for research

articles using the ProQuest and EBSCO Host databases of scholarly journals to conduct this analytical review. In accordance with the focus of this project study, an exhaustive search of the scholarly / peer-reviewed research was conducted via the following search terms and phrases: (a) minorities OR "African American" AND "health care" "career field" OR "profession"; (b) minorities OR "African American" AND "retention" OR "attrition" OR "matriculation", (c) "minorities" OR "African American" AND "academic enrichment" OR "academic intervention program" AND "health education", (d) :minorities" OR "African American" AND "health care career programs" and (e) "health care career programs" AND "assessment". A review of the studies retrieved from each search for relevance to this study formed the basis of this analytical review of the current research accordingly.

This analytical review of the research unfolds in an orderly manner. First, a review of current research and government reports addressing the demographic disparity of ethnic minority populations in health care career professions. This leads to a discussion of the research addressing the academic deficiencies and disparities of minority populations at the pre-college and post-secondary levels of education and specifically within health care degree programs. Followed by a presentation of research addressing health care career education enrichment and degree program and surrounding issues. This section concludes with a summary of the key components of this study, and a preview of the section that follows.

Health Care Workforce Demographic Disparity

An increasing shortage of providers and the lack of workforce diversity challenge many fields within the health professions industry (Pollard, et al, 2010). A large body of literature identifies the persisting health care workforce shortages faced by the nation. Using forecasted job growth data for health-related fields throughout the nation, Carnevale et al (2012) predicted that the health care workforce will require an additional 5.6 million providers by the year 2020. The projected growth exceeds the growth demand of all other professions in every state apart from Maine, Pennsylvania, North Dakota, and West Virginia (Carnevale et al, 2012). The demand for primary care professionals will be higher in states with high concentrations of overweight and obese populations (Carnevale et al, 2012). As a state with an adult population that demonstrates 26.1% as having a sedentary lifestyle and 62.9% clinically defined as obese (BMI $\geq$ 25), Carnevale et al (2012) projects that the South Carolina health care workforce will increase from 8% in 2010 to 30% by 2020.

The literature noted a lack of cultural competence among health professionals noted to propagate a lack of care for marginalized populations, i.e. racial and ethnic minorities, uninsured, non-English speaking, poor, and Medicaid recipient patients (Marrast, et al, 2014). Marrast et al (2014) cited the greater potential of URM physicians to serve marginalized populations to justify the need to increase the number of URM health care professionals.

An equally ample amount of literature supports the recruitment of URM students as an effective strategy for addressing workforce shortages. A positive strategy for addressing the number of health disparities that are disproportionately prevalent in racial

and ethnic minority communities is to increase the number of URM health care professionals (Evans et al, 2013). Growing demands for health care providers, and the growing racial and ethnic minority populations highlight the need to prepare racial and ethnic minorities to meet the demands of the health care industry (Ricketts, 2011). Marrast et al (2014) conducted a cross-sectional analysis of 7070 adults who participated in the 2010 Medical Expenditure Panel Survey and who identified a medical practitioner as their primary care provider. The research results demonstrated that URM practitioners served as the primary source of care for 53.5% of the racial and ethnic minority respondents and 70.4% of the non-English speaking respondents (Marrast et al, 2014). Despite data demonstrating that URM primary care practitioners provide care for a disproportionate segment of minority and underserved populations, the achievement of gains in the number who enter the field is underwhelming (Marrast et al, 2014).

The lack of racial and ethnic diversity within the field of nursing calls for transition to meet the increasingly diverse American population (Barra, 2013). An education based study examined the strategies of medical mathematics bridge and tutoring programs designed to reduce the attrition of African American students who enter the licensed practical nursing (LPN) program in a community college (Barra, 2013). An inability to master medical calculations contributes to an approximate 50% attrition rate of students who enroll in the first three courses of the LPN program (Barra, 2013). The presentation of several studies that focused on the numeric skills of nurses supported the implementation of a quasi-experimental pilot plan consisting of tutoring and a structured medical mathematics intervention program offered as a tuition-free,

prerequisite elective to admission to the nursing program (Barra, 2013). Retention increased among study participants who enrolled in the course and attended the weekly sessions, while a decrease in grades correlated with limited or no attendance, which resulted in course failure and program dismissal (Barra, 2013). From the findings, the Barra (2013) concluded that African Americans who entered the LPN program benefit from participation in the bridge program, which serves as a strategy in addressing retention (Barra, 2013).

Available literature reported the influence that a lack of diversity among nursing students and faculty has on the recruitment of racial and ethnic minorities to the field (Payton et al, 2013). Payton et al (2013) conducted a qualitative study to describe African American nursing students' perceptions of mentoring. Data collected through a semi-structured, face to face interview, were analyzed "using the constant comparative method to inductively review, code, and categorize data within themes" (Payton et al, 2013, p. 173). Themes of role models, tricks of the trade, and racial relativeness emerged (Payton et al, 2013). Recommendations based upon the findings of the study provided strategies to promote mentoring among minority nursing students (Payton et al, 2013).

Shelton et al (2016) conducted a study to propose a conceptual framework to investigate predictability factors of activity and retention at various levels to examine the use of those factors by African American lay health advisors (LHA) within an evidence-based program such as the National Witness Project (NWP) (Shelton et al, 2016). Lack of, and / or limited funding along with the recruitment and retention of LHAs challenged the sustainability of the NWP. Shelton et al (2016) collected baseline data via

questionnaire from 76 LHAs from across the nation recruited as study participants. The use of Chi square and ANOVA tests identified variances between retained and inactive LHAs. Shelton et al (2016) defined predictor variables using LHA retention and activity levels using multivariable logistic regression models. The article reported a consistent link between factors related to the role of the LHA and organization as low retention levels, and reported recommendations to address these factors. The findings of the associated study provide empirical evidence towards addressing the sustainability of LHA programs (Shelton, 2016).

To gain a better understanding of how to effectively enact URM recruitment strategies, it is important to identify and gain a clear understanding of issues that limit the success of recruitment strategies. Harris, Lewis, and Callaway (2012) examined issues associated with the underrepresentation of minorities within the health field, including the barriers to the pursuit of careers in health by members of URM populations. Harris et al (2012) cited funding shortfalls, court rulings prohibiting the use of race and ethnicity, admission criteria, and public education deficiencies as systematic barriers to increasing the number of URMs entering the health professions pipeline. Smith et al (2009) also reported that a number of socioeconomic inequities within URM populations exists, including poverty, health status, and racism. Smith et al (2009) cited that social disparities or inequities serve as barriers to academic achievement and correlates with health disparities, and educational inequalities, which further justify the need to increase health workforce diversity.

Skorin (2013) cites the lack of diversity among health professionals as influencing the delivery and access to care by the increasing number of members of URM populations. The author supported the position that minority health professionals are more likely to deliver care to poor, noninsured individuals and those insured by Medicaid than nonminority health professionals (Skorin, 2013). The institution of the Title VII of the Public Health Services Act in 1963 sought to increase access to health care providers (Skorin, 2013). Several programs, including the Health Careers Opportunity Programs (HCOP) and Centers of Excellence (COE), emerged from the Title VII to increase educational opportunities for members of educationally and/or economically underserved populations. Institutions that received funding to support HCOP and COE initiatives statistically recruit and graduate up to five times the number of disadvantaged and URM health professionals than institutions that do not (Department of Health and Human Services as cited by Skorin, 2013). Diversifying the health care workforce and meet the needs of marginal populations requires multiple approaches (Skorin, 2013). Skorin (2013) concluded that available data justifies the need for the continuation of funding to support initiatives designed to recruit and prepare members of underserved and URM populations for health professions entry to help narrow the population disparity gaps within the health professions' workforce (Skorin, 2013).

The state of South Carolina exemplifies demographic and workforce trends in the health care industry. Racial minorities make up 34.5% of the state population; however, this segment of the state population makes up only 7% of the state's physician workforce (Lacey & McCleary, 2012). Furthermore, while 27% of the state population is African

American, the Office of Workforce Analysis and Planning reports that African Americans comprise less than 11% of the state's health care workforce in its entirety (Lacey & McCleary, 2012).

African-Americans remain notably underrepresented in South Carolina's health care profession degree programs as well (Lacey & McCleary, 2012). An analysis of available enrollment management data of the two largest and oldest multi-disciplinary primary health care training programs in the state showed slight diversity gains in health profession program enrollments. Appendix A includes tables and figures that provide a composite of longitudinal enrollment data made available through the Medical University of South Carolina and University of South Carolina websites (retrieved from http://ipr.sc.edu/enrollment/ and http://academicdepartments.musc.edu/esl/em/reports/long_reports/).

The data demonstrate incremental increases in African American and Hispanic medical school enrollments ranging from 24% and 5% in 2010 to 29% and 10% respectively in 2013. Enrollments in nursing showed minor fluctuations for both populations, while Native American enrollments were nominal for both programs. Despite the noted statistical increases, African-Americans, Latino, and Native Americans remain severely underrepresented in South Carolina's health profession education programs (Lacey & McCleary, 2012).

Projected Health Care Needs

There is a growing demand for health care in the United States. Carnevale et al (2012) documented the anticipated strain that the baby boom generation, born between

1946 and 1964, will place on the nation's health care system. The Carnevale et al report (2012) published by Georgetown University Center on Education and the Workforce forecasted a need for an additional 5.6 million health care workers by 2020. Projections indicate the presence of a national shortage of 91,000 primary care physicians (Kirch et al, 2012). The Carnevale et al. (2012) report further projects that 4.6 million of the required positions will require postsecondary education.

As the demand for health care professionals increase, trend analysis of census data indicates an increase in racial and ethnic minority populations. Thomas Ricketts (2011) of the Department of Health Policy and Management noted the necessity of training an appropriately skilled workforce that reflects the demographic make-up of the population requiring care. The Sullivan Commission on Diversity in Health Care Workforce report released in 2004 (as cited by Evans et al, 2013) highlighted the need for this congruency to address persistent health and health care disparities of racial minority populations. Ricketts (2011) further asserts that using demographic data to anticipate the needs, demands, and adequacy of the health care workforce is vital to the political economy of our nation.

Educational Disparity

Studies addressing the demographic disparity of minorities in the health care professions have found that underrepresented minority (URM) students do not differ from their white peers in health care career aspirations at the primary and pre-college grade levels (Auro, 2011). Matriculation data and student achievement test score data, however, indicate that African American and Latino student populations lack the skills,

behaviors, and the disposition to successfully matriculate into and through health care degree programs (Arora et al, 2011). A study conducted by Morrison and Cort (2014) for the Association of American Medical Colleges (AAMC) reported that 18% of African American high school sophomores aspired to become physicians in 2002; however, medical schools admitted less than 7% of the cohort by 2012. Other studies have identified and further examined additional factors that contribute to the academic deficiencies of underachieving racial minorities. These factors include barriers associated with the sense of belonging and self-identify, perceived ability, socioeconomic status, educational inequities, and lack of mentorship **(**Harris et al, 2012; Karp, 2011; Smith et al , 2009; Deas et al, 2009; & Arora et al, 2011).

The Higher Education Association (HEA) reported that African Americans earned only 7% of all terminal academic degrees awarded in the United States in 2010 (Kreuter et al, 2011). African American undergraduate students earn four-year college degrees at a rate of 54.7% compared to a rate of 73.4% of white undergraduate students (Lynch, 2013). A recent survey conducted by the President's Council for Advisors on Science and Technology (cited by Byars-Winston, 2014) reported higher attrition rates among URM and women enrolled in science-based degree programs at the college freshman level.

The South Carolina health care workforce reflects the national demographic and workforce trends in the health care industry. The predominant racial minority population is African American, comprising 27.3% of the 31.7% ethnic minority population in this state. Although ethnic minorities comprise 31.7% of the state population, these ethnic minorities make-up only 7% of the South Carolina physician workforce (Lacey &

McCleary, 2012). The South Carolina health Professions Data Book 2012, published by the Office of Workforce Analysis and Planning (Lacy & McCleary, 2012) reported that African Americans comprise less than 11% of the state's health care workforce in its entirety.

Smith et al (2009) identified addressing gaps in the educational quality between URM and white K-12 students as a primary strategy for increasing the diversity of students entering health education programs. The decreased likelihood of URM students to graduate high school with the math and science rigor needed for successful matriculation into health education programs provided an example of existing educational inequalities (Smith et al, 2009).

Academically, students from racial minority populations face more difficulty in obtaining undergraduate and graduate degrees when compared to white students (Slovacek et al, 2011). An analysis of data from the Minority Opportunities in Research (MORE) Division, facilitated by the National Institute of General Medical Sciences (NIGMS) determined the effectiveness of the programs four primary components at three public universities funded by National Institute of Health (NIH) and National Science Foundation (NSF) (Slovacek, et al, 2011). The study concluded a series of factors that indicate successful matriculation into a health-related terminal degree: faculty mentorship, opportunities to communicate engaged learning (research) at conferences, and undergraduate grade point average (academic background).

Despite the availability of educational enhancement opportunities to increase the percentage of URM and underserved students who pursue careers in science since the

1980s, graduate school admissions for first generation, low income, African American and Hispanic students remain low when compared to white students who participate in these programs (Keith & Hollar, 2012). To assess the impact of a pre-medical pipeline program in addressing academic achievement gaps and successful matriculation through medical school, implementation of a retrospective design evaluated a longitudinal sample of disadvantaged students who completed the MED program.

Keith and Hollar (2012) conducted a study to assess the influence of the University of North Carolina's Medical Education Development (MED) program to address achievement gaps experienced by disadvantaged students. A logistic regression analysis helped Keith and Hollar (2012) to identify significantly correlated factors with earning a medical degree. The results analysis concluded that race, science and cumulative grade point averages with African American, Hispanic, and Native American program participants earned a medical degree at the same rates as Caucasian participants (Keith, & Hollar, 2012). When compared nationally, MED participants successfully earned a medical degree despite having obtained lower Medical College Admissions Test (MCAT) scores and GPAs (Keith, & Hollar, 2012). The findings of the study suggest that the intensiveness of the nine-week MED program supports the successful matriculation of program participants (Keith, & Hollar, 2012).

An association between student success and academic achievement may exist. A review of literature found educational deficiencies reported as inhibitors to the academic preparation of high school students, which may affect undergraduate performance. The educational deficiencies noted by Harris et al (2012) and Weischadle (2002) as a barrier

to the successful matriculation of URM students. Through an analysis of secondary data conducted by Harris et al (2012), the research concluded that educational inequities between URM and white students exist. An example being the higher dropout rates of URM high school and college students when compared to that of white high school and college students (Harris et al, 2012). Smith et al (2009) branded variances between URM and white students reported in the available literature as an "opportunity gap" (p. 837). To address the growth of minority populations and the persisting and projected workforce shortages, Smith et al (2009) suggested the ability of K-16 educators, academic medicine, and governmental entities to do more in preparing and integrating URM into health professions presents an opportunity.

Postsecondary education requires students to conform to new expectations, develop and engage in differing social environments and relationships, and learn to navigate new bureaucratic requirements (Karp, 2011). URM undergraduate students often face intensified barriers to academic success than do their white peers that include socioeconomic impediments (Rebell, 2012), threats of prejudice and stereotyping, and the lack of social supports that challenge his or her self-identity and sense of belonging (Syed & Cooper, 2011). Understanding and enacting new academic and environmental expectations challenges postsecondary students; however, current state demographic and poverty indices amplify these challenges among students from vulnerable populations (Karp, 2011).

Loftin et al (2012) identified similar barriers for nursing students. Loftin et al (2012) found several themes that emerged through the comprehensive and integrative

review of literature published between 2006 and 2011 on several small studies related to nursing student success. Review results indicate that URM nursing students face numerous barriers for the successful completion of undergraduate nursing programs. Financial challenges, the need for formal mentoring and professional socialization, and needed support for technical and computing competence emerged as the most common themes (Loftin et al, 2012). Only URM students who completed the nursing program that he or she enrolled faced the cited barriers. None of the studies reviewed included participants that were unsuccessful in completing the nursing program, which leaves a significant gap in the literature set (Loftin et al, 2012).

A conducted literature review sought to assimilate research findings with barriers perceived by African American students in entry level nursing programs. Alienation, isolation, and being different were barriers to academic success faced by URM students (Murray, 2015). The review concluded with recommendations to establish diversity and inclusion plans, academic enrichment opportunities and support services, mentorship, and activities to foster student engagement while cultivating environments of belonging and acceptance that contribute to the academic success of URM students (Murray, 2015).

Ethnographic studies conducted by Cox (as cited by Karp, 2011) offer examples of how student perceptions of college environments affect sense of belonging while misinterpretation of faculty interactions hinder positive academic practices. Validation by faculty and staff and the establishment of social connections can improve academic outcomes (Karp, 2011). Through a review of student persistent theories and program evaluation literature, Karp (2011) identified four non-academic mechanisms to promote

student success: establishing social relationships, defining ambitions and strengthening commitments, development of college savvy, and improving the feasibility of college as an option. Addressing inhibitors to the successful matriculation of academically vulnerable students exceeds the mastering academic skills (Karp, 2011). Karp (2011) suggested that exposing students to the cited mechanisms, both formally and informally, as a strategy to structure supports within day to day student life for academic achievement.

Education Enrichment Programs and Associated Issues

Education enrichment programs, or extended learning opportunities (ELOs), are available outside the classroom to address academic gaps (Smith et al, 2009). Globally, ELOs seek to address limited funding for school-based science education (Winkleby et al, 2013). Research conducted by Weischadle (2002) noted the value of ELOs that supplement in-class instruction with focused educational activities to promote student achievement despite the presence of socioeconomic and cultural barriers. Smith et al (2009) cited the importance of pipeline (longitudinal) programs as ELOs in specifically addressing workforce diversity issues, educational opportunity gaps, and reducing health disparities. Pipeline, enrichment, and other social programs designed to diversify the health professions pipeline are important to improving URM student preparation for academic readiness and preparation for health professions education and training (Smith et al, 2009).

Recent studies have revealed that URM student populations have health care career aspirations similar to their non URM student population counterparts; however,

URM students often lack the skills, knowledge, skills, and behaviors required for successful entry into these fields (Arora et al, 2011). An analysis of secondary data from the Education Longitudinal Study of 2002, administered by the National Center for Education Statistics, and the American College Application Service by the AAMC (2014) found that students from URM populations have a greater tendency of aspiring to become a doctor than of applying or gaining admission to medical school. To address the need for an ethnically diverse health care population, a study conducted by Arora et al (2011) identified it as necessary to prepare URM students to successfully matriculate through health care education programs and into health care professions by fostering the development of the necessary skills, knowledge, and behaviors at the precollege level. Arora et al (2012) analyzed the design and evaluation of the Training Early Achievers for Careers in Health (TEACH) Research Program to determine the effectiveness of realistic career experiences and tiered mentorship in developing the attitudes, knowledge, and behaviors among URM students as elements of aligned ambition. Preliminary findings suggested a refinement and deepening of health career aspiration (Arora, et al, 2012).

The National Center for Educational Statistics cites an increased likelihood that URM undergraduate students are more likely to leave fields of science than their white counterparts (Danner et al, 2016). Thus, many colleges have implemented pipeline programs designed to prepare and inspire high school and undergraduate students towards health-related professions. The authors present the findings of a study conducted to assess the ability of a hospital-based, multidisciplinary youth mentoring and health career exploration program to influence the decision of URM students in choosing to

pursue a career in the health professions (Danner et al, 2016). A retrospective analysis of the Reach One Each One (ROEO) Program positively influenced the career decisions of the participants. With the approval of the Morehouse School of Medicine, a phone survey conducted of the 26 inner-city, high school senior participants assessed the1) college enrollment and attendance, 2) health profession major, and 3) pre-med status. An analysis of the findings concluded that the 16-week hospital-based program can positively influence the lives and health-related career decisions of aspiring URM high school students (Danner et al, 2016). Danner et al (2016) cited the need for additional study to corroborate those components of the program that are most influential and needed for student success.

University based, science technology, enrichment, mathematics, and health, university-based program pipeline (STEAM H) programs address the career interests and academic readiness of URM students using a variety of formats approach (Wallace, Perry, Ferguson, & Jackson, 2014). Using a mixed methods approach, Wallace et al (2014) investigated the impact of a science technology, enrichment, mathematics, and health, university based program pipeline program. Wallace et al (2014) conducted a mixed methods approach to assess the significance of the Careers in Health and Medical Education Program among a predominately African-American audience (N = 155) over a two-summer time frame. The authors noted challenges associated with defining to what extent replication of the program model can occur at other institutions, and questions the cost effectiveness of the program. A results analysis, however, found that participants made significant academic and career knowledge gains (Wallace et al, 2014).

Only six percent of dentists in the United States are from URM populations (Lacy, McCann, Miller, Solomon, & Reuben, 2012). The American Dental Education Association has collaborated with dental schools throughout the nation for years to address this persisting workforce disparity, and to improve access to care for underrepresented and marginalized populations (Lacy et al, 2012). Foundation funding has supported the creation of common initiatives to support this effort. Texas A & M Health Center Baylor College of Dentistry designed a series of initiatives to comprehensively address barriers to URM matriculation into dental school. The Bridge to Dentistry program targets URM students in grades pre-K through 12th, and offers eight program components annually. The components promote career awareness, attraction, and academic enrichment (Lacy et al, 2012). An analysis of data found that the college enrolled greater numbers of URM students in the dental program than any other non-minority dental program in the nation between 2006 and 2009 (Lacy et al, 2012).

Evans et al (2013) conducted case studies of two URM enrichment programs to assess the management of funding decreases. Both programs started in the late 1970's to identify, recruit, and provide URM middle school and high school students with academic and motivational support to prepare for articulation into health education programs (Evans et al, 2013). The study relied on the use of key informant responses. Through an analysis of the collected data, Evans et al (2013) concluded that adequate funding is essential to the continued success of URM targeted pipeline programs to ensure a sustainable health professions workforce was in line with the Harris et al (2012) findings.

Issues surrounding health and educational disparities affect the nation. Spurred by the Association of American Medical College's Project 3000 by 2000 to increase the number of URM students who enter medical school, the West Virginia School of Medicine instituted the Health Sciences and Technology Academy (HSTA) in 1994 (McKendall et al, 2014). The authors provided a perspective on the framework and philosophy of the HSTA along with underlying theories and pedagogies that have emerged from research within the field of education (McKendall et al, 2014). The HSTA offers four sequential camps that provide laboratory and classroom trainings and enrichment activities to support the college admission and retention of URM high school students. Despite the collection of data that demonstrate the success of the HSTA program, comparisons between the 1,402 program participants and other populations were unfounded (McKendall et al, 2014). The difficulties in ascertaining if correlations between HTSA participation and college admission and graduation were the result of an overrepresentation of African American, first generation, and economically disadvantaged students among the program's population, and longitudinal tracking (McKendall et al, 2014). Despite the identified limitations, the authors recommend replication of the HSTA based upon the identification of successful outcomes (McKendall et al, 2014). McKendall et al (2014) concluded that with community support, resources, and opportunities to succeed, members of at-risk populations can anticipate achieving educational goals when motivated by potential and desire.

Literature suggest that a lack of systemic diversity policies undermine the effectiveness of pipeline programs that target URM students. In addition to identifying

the value of pipeline programs, Smith et al (2009) cited the similar importance of affirmative action in addressing workforce diversity issues, educational opportunity gaps, and reducing health disparities. Smith et al (2009) noted anti-affirmative action initiatives as a threat to destroying the strategic value pipeline programs offer to address the health professions workforce shortages. Despite the adversarial and often emotional debates that surround affirmative action, Smith et al (2009) referenced a large amount of research that demonstrate an increased probability of URM health professionals to serve medically underserved and vulnerable populations.

William Kidder (2012) conducted a survey of 9,750 African American and Latino undergraduates enrolled in eight University of California campuses, the University of Texas at Austin, and two leading American research universities. A review of the data collected between 2008 and 2011 revealed that affirmative action bans on campuses where there is a lack of diversity have a higher association with a perceived lack of respect for students from the targeted population than those students enrolled on campuses where affirmative action and/or higher levels of diversity is present (Kidder, 2012). Nunez (as cited by Kidder, 2012) explained that affirmative action bans can intensify feelings of helplessness and undermine a sense of belonging among URM students and decrease the quality of the educational environment. The lack of diversity policies may subconsciously communicate a perception that URM students are unqualified and unwelcomed (Kidder, 2012) which may serve as a barrier to the matriculation of URM students into health education programs. An analysis of pipeline

and enrichment programs conducted by Smith et al (2009) emphasized the importance of such programming in addressing the academic readiness of URM students.

Rashied-Henry et al (n.d.) presented research on the development and implementation of a summer internship program designed increase the knowledge of health disparities, provide the application of community-engaged research, and encourage the pursuit of careers in health by URM students. Using a youth-focused, participatory action research design, 51 students enrolled in a New York science enrichment program engaged as participants in a four-week summer internship experience. The findings included an increase in knowledge of ethnic / racial disparities, and expressed interest in pursuing health-related careers (Rashied-Henry et al, n.d.). The findings also led the researchers to conclude that educational opportunities conducted through community-academic partnerships can "strengthen the academic pipeline for students of color interested in health careers and health disparities research" (Rashied-Henry et al, n.d., p. 412).

The Sisters of the Academy (SOTA) adapted the KEMET (Knowledge and Excellence in Mathematics, Equilibrium, and Technology) Academy model to provide an academic and cultural enrichment opportunity for African American students enrolled in schools that were under resourced (Davis-Maye, Davis, & Jones, 2013). In partnership with Southern land grant institution affiliates, the adapted model implementation over five years as a competency-based initiative worked to increase the matriculation rates of African American students through community college and into graduate level education (Davis-Maye et al, 2013). With 49% of African American undergraduate students

enrolling in community colleges initially following high school graduation (Mullins & Phillips as cited by Davis-Maye et al, 2013), the KEMET model provided an organizational mechanism designed to socialize URM populations and enhance the community college experience and beyond within the developmental pipeline (Davis-Maye, 2013). As adapted by SOTA, the Kemet inspired program intended to contribute to growing access to higher education by members of URM populations (Davis-Maye, 2013).

DeNomie (2012) published an article designed to equip adult health advocates with the knowledge and skills to implement a youth physical activity program that also promotes health knowledge and health career awareness. The Institutional Review Boards of the Medical College of Wisconsin and the Milwaukee Area Technical College approved a study to assess the impact the designed program had on raising the awareness of low-income URM students of achievable health career options, and reduce health disparities related to physical inactivity (DeNomie, 2012). Analyses of data collected using weekly questionnaires assessed trainee reaction to the program and the acquisition of new skills. A review of the analysis concluded that an increase in knowledge and understanding occurred; the trainees were better able to promote health lifestyle practices; and there was an acknowledgement of the value of role models in helping to build and maintain a health career network for the youth (DeNomie, 2012). Identified as a weakness of the training was the limited opportunity to discuss relevant topics was (DeNomie, 2012). The one year pilot of the program engaged parents, other adults within a faith-based environment, professionals, and service learning students to enhance the

delivery of the program's content. An alignment of activities with student participant interests contributed to a reporting of high participant satisfaction, improved confidence in healthy lifestyle practices, and increased health career awareness (DeNomie, 2012).

Ample literature reports the need for pipeline programs to have sustained financial and human resource. As a part of the systematic plan launched by the MUSC College of Medicine in 2002, Deas et al (2012) reported the availability of financial resources as vital to infusing diversity among students, faculty, and residents. Despite the available documentation, Grumbach et al and the Congressional Black Caucus (as cited by Harris et al, 2012) identified a severe decrease in federal funding for pipeline programs that target URM populations that occurred between 2004 and 2008. Historically, federal funding served as the largest source for increasing the diversity of the health care workforce. Despite the availability of federal, state, and private funds to support pipeline and enrichment programs to address the lack of diversity within health professions (McGee & Fraher, 2012), threats to funding sources continue. An example being the 2016 federal executive budget proposed by the Obama administration (n.d.) eliminated funding for AHEC and the workforce initiatives it sponsors at the national, state, and local levels. In addition to threatening the continuation of pipeline programs (McGee & Fraher, 2012), Kimbell and Bacon (2006) noted that susceptible budget cuts to national, state, and private funding streams also increase funding competitiveness.

Haskins and Margolis (2014) emphasized the outcome of federal policies that began to emerge in 2010 requiring the documentation and reporting of evidence-based outcomes to secure funding for social programs. The expansion of evidenced-based

policies for federally funded social programs that has occurred within the last six years further challenge pipeline programs to strengthen evaluation processes (Haskins & Margolis, 2014). Evidence-based initiatives developed during the Obama administration have the potential to transform the disbursement of federal funds to social programs at the state and local levels (Haskins & Margolis, 2014). The authors outlined in detail the necessity for rigorous and scientific evaluation to validate programmatic outcomes that demonstrate social change.

Implications

The purpose of this study was to assess the extent and type of HCA program participation that may foster the successful academic matriculation of URM students into health care degree programs. The results of this assessment provided needed insights to guide and support program improvement efforts. Toward this end, this project study culminated in a position paper for presentation to the AHEC. This position paper presented the results of this assessment and corresponding suggestions for program improvement, including recommendations for a formal program evaluation. Ultimately, the findings from this study support positive social change via a fostering the successful matriculation of racial minorities through health care education programs and into health care professions through sustained and improved programming.

Summary

There is an underrepresentation of racial minorities in health care positions. As demands for health care increase and racial minority populations continue to expand, it is becoming increasingly necessary to address this disparity via preparing racial minorities

to fill these positions. As matriculation data and student achievement test score data indicate, many racial minorities lack the skills, behaviors, and the dispositions to successfully matriculate into and through health care degree programs and into health care professions (Arora et al, 2011). ELO and enrichment programs, including the HCA program of South Carolina, offer a promising means to address the disparity of URM students entering and completing health care degree programs and into health care professions. Per decreased availability of government funding sources and increased accountability measures, in conjunction with increased competitiveness for existing funds, it is becoming increasingly necessary for the HCA program to assess the extent and manner it is achieving its intended purpose of fostering the successful matriculation of URM students into and through health care degree programs and into health care professions. Toward this end, this project study assessed the extent and type of HCA program participation associated with the successful matriculation of URM students into and through health care education programs. A summary of these findings, with corresponding recommendations for program improvement efforts and potential recommendations for further evaluation, is available for presentation to the AHEC. The Methodologies section details the manner in which this study took place. Included in the summary are details of the population sampling, data collection and analysis processes, and a review of limitations, assumptions, and scope.

Section 2: The Methodology

Research Design and Approach

Through this study, I sought to assess the extent and type of HCA program participation that may foster the progression of URM students into health care degree program and into health care professions. I used a retrospective longitudinal research design in which I retrieved and quantitatively analyzed archived program data and preexisting student matriculation data. I used sequential logistic regression procedures to conduct my analyses.

A researcher uses a longitudinal research design when interested in assessing the effect of the independent variable at a later point in time (Lodico et al, 2010). The methodology involves repeated observations to evaluate the effects of the same variable(s) over an extended period (Lodico et al, 2010). The observations can be of people, processes, or systems with data collection occurring prospectively at multiple points or retrospectively over time to investigate what progressions or changes occurred (Lodico et al., 2010). To determine the extent and manner in which HCA program participants matriculated into health care degree programs, I deemed the use of a longitudinal, quantitative study design as appropriate.

Setting and Sample

Sampling Process

Retrieval of a study sample of interest required a two-pronged approach. The first step entailed identifying the population of students who had participated in the HCA program between 2006 and 2010. Inclusion in the study required students to have

engaged in the program within this timeframe, participated in the corresponding iteration of the HCA, and had enough time to complete the prerequisite undergraduate courses required for admission to a health professions education program. The AHEC database manager obtained the study population by running a query of the AHEC database using the fiscal year dates of 2006 – 2010 as the parameters.

The next step was to query the obtained study population against the National Student Clearinghouse database. AHEC uses the Clearinghouse as a primary means of tracking the higher education enrollment and graduation history of participants of its student programs (S. Boulanger, personal communication, April 22, 2017). I used the results of this query as my study sample.

Study Sample

The resultant study sample consisted of 682 URMs enrolled in 88 distinct high schools and participated in the HCA program between August 2006 and June 2010. Review of a priori power-analysis concluded that this study sample size as sufficient to test each research hypothesis with a power of .80 and a medium effect size and a .05 level of statistical significance. I used the StatsSoft Power Analysis tool to conduct the analysis. The results of this analysis indicated that a study sample of 187 ($N = 187$) would be sufficient to test each research hypothesis with these specifications of power, effect size, and level of statistical significance. With an anticipated sample size of 682 ($N = 682$), this study exceeded the necessary sample size.

The population selected for the study met the specifics necessary for evaluation of the HCA based upon (a) the convenience of the sample as HCA program participants and

(b) the passing of the minimal length of time required for program participants to matriculate from high school through the health professions pipeline. The population included high school students who had enrolled as HCA participants between 2006 and 2010. Included were representatives from each of the four AHEC regions: Lowcountry (21%), Mid-Carolina (24%), Pee Dee (35%), and Upstate (20%). The sample was diverse in gender, race, ethnicity and included both rural and urban communities of residence. Excluded from the sample are participants of AHEC HCP programs who did not participate in the HCA program, and who did not enroll in college following high school graduation.

Instrumentation and Materials

Population data provided for this study underwent a three step verification process conducted by the South Carolina AHEC database manager (Boulanger, personal communication, April 22, 2017). Raw demographic data were self-reported by HCA participants via the HCP program enrollment form, confirmed with parental signature, and collected by the regional AHEC centers. AHEC collected regional data sets submitted electronically and compiled in the South Carolina AHEC database on a quarterly basis. The state database manager reviewed submitted regional data sets for errors and returned these to the regional centers for edits and confirmation. The data collected at enrollment from the HCA participants provided demographic information (i.e. gender, race, ethnicity, county and zip code of residence) that was appropriate, I believe, for implementation of this study. Excluded from the provided data set were identifying data.

Independent Variable

In accordance with the purpose of this study and corresponding research questions, the independent variables of interest were (a) type of HCA program participation and (b) extent of HCA program participation. Participation in the HCA program entailed attendance in grade-specific curriculum modules, service learning opportunities, experiential learning sessions, and individual and group advising. Participation spanned from 1 to 9 months per each academic year, extending from 9th to 12th grade. The AHEC database provided raw data on the number and topic of module completion, type and amount of activity, and the length of program engagement of each member of the study population. Accordingly, the study measured type of HCA program participation via the following program participation scenarios: (a) modular completion with no additional activity involvement, (b) modular completion with service learning involvement, (c) modular completion with experiential learning session involvement, and (d) modular completion with service learning and experiential learning involvement. The extent of participation measured the total number of months each student actively participated in the HCA program from 9th to 12th grade-regardless of type of involvement. The continuous and quantitative nature of each independent variable called for the use of a ratio scale of measurement (Sylvia & Terhaar, 2014).

Outcome Variable

Of interest within this study was to determine the effect of the HCA program in attaining its intended goal of preparing racial minorities for successful matriculation into health care education programs. As such, the primary outcome or dependent variable of

interest was health care education program matriculation. The National Student Clearinghouse database provided the required data for measuring this outcome variable of interest. The data included higher education enrollment, major, and graduation information. The use of the obtained data aided in the assessment of student matriculation in accordance with the following categories: (a) program completed/degree earned, (b) matriculation in progress along degree path, or (c) not enrolled. Further assessment included data indicating current enrollment in a health care degree program with respect to the rate of progression toward earned degree: (a) continuous progression or (b) delayed progression. The assessment of "not enrolled" encompassed categorization with respect to enrollment history: (a) did not begin degree program or (b) discontinued degree program. The categorical nature of each dependent variable, based upon the term of frequency used to classify and label, substantiated the use of a nominal scale of measurement (Sylvia & Terhaar, 2014)

Covariates

The successful matriculation through health care degree programs may vary resulting from various other demographic and professional factors. This study assessed the extent and manner in which the relationship between HCA program participation and health care education program matriculation varies with respect to three factors: (a) gender, (b) health care area pursued / entered, and (c) HCA / AHEC region. The covariate of health care area pursued / entered analysis assessed the relationship between HCA program participation and health care education program matriculation data with respect to the following health care profession areas: (a) allied health, (b) medicine, (c) nursing,

and (d) pharmacy. Accordingly, this is a categorical measure. The covariate of HCA program / AHEC region analysis assessed this relationship with respect to the regional AHEC organization affiliated with each HCA program: (a) Upstate, (b) Lowcountry, (c) Midland, and (d) Pee Dee regions of the state. Categories of (a) rural and (b) urban provided further regional identification.

Procedures

Data Collection

A query of the existing South Carolina AHEC participant database provided data for measuring the independent variables and covariates of interest. Program participants reported demographic data at the time of enrollment in the HCA and submitted to the database by the four regional AHEC program coordinators. The regional coordinators documented module and activity participation. The documentation included module or activity categorical type, title, length, location, date, and facilitator. Coordinators entered the collected data into the web-based, password secured AHEC HCP database monthly.

The AHEC database manager verified the use of a three step authentication process for validity and reliability (Boulanger, personal communication, April 22, 2017). Parental signature collected by the regional AHEC centers confirmed the accuracy of self-reported HCA participant data. AHEC center staff electronically submitted monthly compilations of regional data sets to the South Carolina AHEC database. The state database manager reviewed submitted regional data sets for errors, returned to the regional centers for edits and confirmation, and resubmitted to the database manager. The

AHEC database manager and Medical University of South Carolina administrators monitored, maintained, backed up, and secured HCP data on university servers.

The AHEC database manager facilitated securement of data measuring the outcome variable of interest, health care education program matriculation, from the National Student Clearinghouse (NSC) database. McGladrey LLP per Government Auditing Standards examined NSC data for validity and reliability as outlined by the U.S. Comptroller General, and authenticated based upon standards established by the American Institute of Certified Accountants (retrieved from http://studentclearinghouse.info/onestop/wp-content/uploads/2014AuditSummary.pdf).

I submitted a written request for permission to access the raw data for the purposes of this study to the AHEC associate director of education. The associated director granted written approval of the request on March 24, 2015 (see Appendix E). The raw data used for this study is available from the researcher upon request.

Data Analyses

Entry of raw data, collected from the AHEC and National Student Clearinghouse databases, into SPSS aided in conducting a preliminary descriptive analysis of the data to glean a descriptive overview of the study sample population. Also collected were corresponding matriculation and program participation frequencies and relevant measures of central tendencies. Presented for the full study population, and with respect to gender, area of health care pursued, and AHEC HCA program region were the frequencies and relevant central tendencies of the extent of academic matriculation and the extent and type of HCA program participation. Logistic regression and odds ratio procedures helped

to examine the relationship between the extent and type of HCA program participation and the health care education program matriculation status among URM students who participated in the HCA program between the years of 2006-2010 – i.e., Hypothesis 1 and Hypothesis 2, respectively. The use of sequential logistic regression procedures tested Hypothesis 3 – i.e., to assess differences in this relationship while controlling for (a) gender, (b) health care profession, and (c) HCA program region.

In accordance with logistic regression procedures, the chi-square statistic assessed the goodness-of-fit of the full logistic model predicting matriculation status via the extent significance of the different types of program participation and the extent of program participation as contributors to the successful matriculation of URM students through health care education programs and into health care professions. Use of rho squared aided with assessing the degree of association between each predictor variable and the matriculation status of URM students. Entry of each covariate in the sequential logistic regression analysis helped to determine differences in each test statistic for the assessment of statistical significances.

Scope, Assumptions, Limitations, and Delimitations

The purpose of this study was to assess the extent and type of HCA program participation that may foster the successful matriculation of URM students into health care degree programs. I assumed that the findings of this assessment may help to improve future HCA outcomes with the establishment of focused program improvement efforts, and constitute a foundation for future evaluation. Evaluation of the HCA should offer a clear, directed, and organized understanding of programming at the implementation level.

Further assumed was that the findings of this assessment would further contribute to the sustainability of the HCA program by helping to determine the appropriate allocation of limited funding sources secured by South Carolina AHEC. Gaining a clear, directed, and organized understanding of the HCA in relation to its content, delivery, and outcomes should promote secured funding based upon the attainment and reporting of more effective outcomes.

The assumptions of this study, in turn, led to the acknowledgement of important limitations. In conducting this study, it assumed that by identifying effective and less effective program components associated with the successful matriculation of program participants into and through the desired programs would further strengthen and sustain the HCA. The extent of program matriculation could not assume that matriculation occurred or did not occur as the direct result of participation in the HCA program. As noted previously, several other factors could influence the successful attainment of educational and career goals. As such, possible program components that may have contributed to the corresponding extent of program and career matriculation limits the implications of these findings. Along this same line, assumptions that a statistically significant association between two or more variables was indicative of a causal type of relationship are unfounded. Hence, the findings of this study solely focused on showing whether a statistically significant association between extent and type of program participation and the extent health care degree program and career matriculation existed. Additional assumptions of this study were that the program participants (a) had intentions of pursuing a career in a health-related field upon program entry, (b) have had adequate

time to successfully graduate high school and complete undergraduate requirements for health profession education program admission, and (c) have made application to a health professions program within the four years following the date of high school graduation.

Limitations

Limitations on the scope and applicability of the propose study may have affected the validity and generalization of the study findings. While the evaluation process may assist similar longitudinal enrichment programs in identifying best practices to establish effective evaluation processes, the specificity of the curriculum and activity content does not allow this study to account for the generality or oversimplification of the evaluation results beyond the facilitation of the HCA program content.

In accordance with the non-experimental research design, the implications of the study results limit the lack of random assignment and the omission of a control group. In turn, the results of this study do not statistically account for the extraneous variables of parental involvement, self-motivation, or other motivational influences outside of the HCA that may have impacted the matriculation of study participants. These limitations preclude the conclusion of causal relationships drawn between the extent and type of program participation and HCA participant matriculation through health care degree programs and into health care professions.

Delimitations

Time and region bound the scope of the this study. Specifically, per the longitudinal study design and corresponding study purpose calling for the use of archived data, the HCA program start date that allowed for the study participants to successfully

matriculate into and complete a health care education program by the start of the study determined the lower end of the time boundary for this study. The date of the most current matriculation data available via the National Clearinghouse database at the start of this study ultimately bound the upper limit of this study. Accordingly, limits of this study include study participants who participated in the HCA program between August of 2006 and June of 2010, and spans through the matriculation data up through to 2014.

As previously noted, ample literature identifies multiple issues surrounding challenges associated with health care workforce diversity. This study design sought to examine the effectiveness of the HCA only. A delimitation of the proposed study is that it accessed and utilized archived program data and focused on the type of program activities and duration of involvement of HCA program participants by using pre-existing health care education and workforce matriculation data to identify the end-point of program participants' matriculation toward the health care profession. Excluded is a comparison of HCA participant matriculation to that of a non-HCA participant population or control group. Also excluded is a qualitative component that offers a subjective complement to the objectivity of quantitative results. A future study might include both a quantitative and qualitative comparison of the proposed study's results with that of a comparable control group to provide a deeper exploration and understanding (Creswell, 2012).

Protection of Participants Rights

Reporting of the AHEC HCP HCA program data and the National Clearinghouse matriculation data complied with the Family Educational Rights and Privacy Act of 1974

(FERPA). FERPA (20 U.S.C. § 1232g; 34 CFR Part 99) is a federal law that protects the privacy of student education records (Sheikh & Goldberg, 2014). While this is publicly available data, it was stipulated that the use of this data for research and reporting purposes must adhere to regulations and procedures to protect human subjects as set forth by the institution' review board (IRB). This study adhered to the IRB procedures and protocols as set forth by Walden University.

The anonymity of study participants, program participation and matriculation data protected human subjects' rights in accordance with IRB regulations. Specifically, assignment of a program generated participant identification code anonymously distinguished individual program participants and associated data. The National Clearinghouse maintains student matriculation data via this same identification number. As this identifying code does not associate with any personal identifying information, confidentiality ensured the anonymity of the study data (D. Carson, personal communication, March 16, 2015).

Data Analysis Results

Introduction

The use of a retrospective longitudinal research design with archived program data and corresponding pre-existing student matriculation data supported the empirical examination of the extent and manner in which a high school intervention program, the HCA program, attained its intended goal of preparing racial minorities for successful matriculation into and through health care education programs and into health care professions. The AHEC database provided raw data on the number and topic of module

completion, type and amount of activity, and the length of program engagement of each member of the study population. Accordingly, three program participation scenarios aided in measuring the type of HCA program participation: (a) modular completion with no additional activity involvement, (b) modular completion with service learning involvement, (c) modular completion with experiential learning session involvement, and (d) modular completion with service learning and experiential learning involvement. The total number of months each student actively participated in the HCA program from 9th to 12th grade – regardless of type of involvement – measured the extent of participation. The purpose of this program evaluation was to investigate if a statistically significant relationship between the extent and type of HCA program participation and the successful matriculation into health care education programs among racial minority students existed. The research questions that guided this study were:

RQ1. Is there a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among racial minority students?

RQ2. Is there a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among racial minority students?

RQ3. Is there a statistically significant relationship between the extent and type of HCA program participation and the successful matriculation through health care education?

Data retrieved from the National Student Clearinghouse database provided the primary outcome variable of interest to this study, health care education program matriculation,. The data included higher education enrollment, major, and graduation information. The data helped to assess student matriculation in accordance with the following categories: (a) program completed / degree earned, (b) matriculation in progress along degree path, or (c) not enrolled. Data indicating current enrollment in a health care degree program with respect to the rate of progression toward earned degree helped to further assess: (a) continuous progression, or (b) delayed progression. The assessment of "not enrolled" further categorized the coefficient with respect to enrollment history: (a) did not begin degree program, or (b) discontinued degree program.

Variances with respect to (a) gender, (b) health care area pursued / entered, and (c) HCA / AHEC region, girded the examination of the extent and manner in which the relationship between HCA program participation and health care education program matriculation existed. The covariate of health care area pursued / entered assessed the relationship between HCA program participation and health care education program matriculation data with respect to the following health care profession areas: (a) allied health, (b) medicine, (c) nursing, and (d) pharmacy. Accordingly, this is a categorical measure. The covariate of HCA program / AHEC region is the regional AHEC organization affiliated with each HCA program: (a) Upstate, (b) Lowcountry, (c) Midland, and (d) Pee Dee regions of the state further defined as (a) rural, or (b) urban.

Use of descriptive analysis procedures assessed the normality, skewness, and dispersion of the data per the corresponding statistical assumptions of the data for logistic

regression procedures. Conducting a preliminary descriptive analyses helped to glean a descriptive overview of the study sample population, the corresponding matriculation, program participation frequencies, and relevant measures of central tendencies for the full study population with respect to gender, area of health care pursued, and AHEC HCA program region.

The analysis found the data extremely skewed and kurtotic. Calculations to test for the skewness of z-values associated with the type of participant engagement variables, i.e. module completion, module and service learning completion, module and experiential learning completion, and module completion combined with service and experiential learning, concluded with extreme z-values for both skewness and kurtosis. Visual inspection of the histogram and normal Q-Q plots visually denoted a negative skewness with the distributions skewed left. Shaprio-Wilk's test ($p < 0.05$) confirmed that the data are not normally distributed. Violation of the normality assumption was not an indication of a problem because the size of the population of this study exceeded 40 (Ghasemi & Zahediasi, 2012).

The data analysis continued with a summary of the population characteristics followed by the results of analyses associated with each research question and corresponding hypotheses. This study analyzed the cases of 246 (N=246) participants of the HCA program who enrolled in college following high school graduation were. The largest covariate subgroups within the sampling were n=72 (92.3%) Black/African-American, n=74 (94.9%) non-Hispanic, and n= 67 (85.9%) female. The federal classification defines *ethnicity* as being of Hispanic, Latino, or Spanish origin by descent

regardless of race; whereas *race* indicates one of five minimum socially defined categories – Black or African American, White, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander (U.S. Census Bureau, 2017). Table 1 depicts post-secondary education enrollments following graduation of the largest covariate subgroups by region.

Table 1

Largest Covariate Subgroup Enrollments by Region, 2006 - 2010

	Black / African-American	Non-Hispanic	Female
Lowcountry	38	46	39
Mid-Carolina	55	57	59
Pee Dee	68	74	79
Upstate	45	54	59
Total	206	231	199

Table 1. Cross Tabulation Analysis

A cross tabulation analysis of population, *N*=246, who graduated from a post-secondary education program found that 78 (31.7%) participants completed requirements for an undergraduate degree. Table 2 depicts graduation rates by region.

Table 2

Graduation Rates by Region, 2006 - 2010

			Region				Total
			Lowcountry	MidCarolina	PeeDee	Upstate	
Graduated	No	Count	36	6	67	59	168
		% within Graduated	21.4%	3.6%	39.9%	35.1%	100.0%
	Yes	Count	13	53	12	0	78
		% within Graduated	16.7%	67.9%	15.4%	0.0%	100.0%

Total	Count	49	59	79	59	246
	% within Graduated	19.9%	24.0%	32.1%	24.0%	100.0%

Table 2. Cross Tabulation Analysis

Identifying the percentage frequencies and relevant central tendencies of the degrees of academic matriculation indicated that n= 224 (91%) of the population either completed or remain enrolled in an undergraduate program: n=2 (0.8%) never enrolled in post-secondary education; n=78 (31.7%) completed an undergraduate degree; n=57 (23.2%) completed a health-related degree program; and n=157 (64.2%) remained enrolled in an undergraduate degree program of study.

It is important to note that categorical frequencies were not mutually exclusive. Participants who completed a post-secondary degree program may have subsequently enrolled in a second post-secondary program of study; thereby, the analysis reflects participants identified as both "completed a post-secondary education degree" and "remained enrolled in a post-secondary education degree". Additionally, due to the health professions education matriculation requirements, the analysis reflects participants simultaneously identified as "completed a post-secondary education degree" and "completed a health-related post-secondary education degree". Therefore, the summary exceeds a value of 100%.

In response to Research Question 1 and Research Question 2, examination of the relationship between the extent and type of HCA program participation and the health care education program matriculation status among URM students who participated in the HCA program between the years of 2006 to 2010 occurred via logistic regression procedures. In accordance with logistic regression procedures, conducting the chi-square

statistic to assess the goodness-of-fit of the full logistic model predicting matriculation status via the extent significance of the different types of program participation and the extent of program participation as contributors to the successful matriculation of URM students through health care education programs and into health care professions. Use of rho squared examined for the degree of association between each predictor variable and the matriculation status of URM students. Assessment of the differences in each test statistic determined statistical significance upon entry of each covariate in the sequential logistic regression analysis. Nominal regression measured the odds ratio for the type of program participation in response to Research Question 2. The following section summarizes the results of each analysis.

Research Question 1 (RQ1) and Analysis

RQ1. Is there a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among ethnic minority students?

$H_0$1: There is not a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among ethnic minority students.

H_A1: There is a statistically significant relationship between the extent of HCA program participation and the successful matriculation through health care education programs among ethnic minority students.

Measures of central tendency computations summarized the data for the extent of program participation variable. Measures of dispersion computations explained the

variability of scores for the coefficients of a) length of program participation, measured by the total months of participation, b) quantity of program participation, measured by the number of participation hours, and c) frequency of program participation, measured by the number of activities participated. Analysis of the results found length of participation [M=1.00, SD=.9255], quantity [M=2.00, SD=11.18], and frequency [M=8.00, SD=11.18].

Based upon the mean scores, it appears that the central tendency of the population, *N*=248, was to participate in < 2 hours of programming, approximately 11.5 activities, and 1.5 months of participation. There is low variability based upon the standard deviations of < 1 for the coefficients of length and quantity of participation; however, the large variability found for the coefficient of frequency was an indication of a wide dissimilarity in activity participation. This implies that the total number of classes and hours that each student participates in the HCA are not indicators of his / her enrollment in a health professions program.

The odds ratio for the length of program participation coefficient for health-related graduates was -.253 with a 95% confidence interval of [.431, 1.398]. Tables 4, 5, and 6 depict the results of cross tabulation comparison of graduation rates and the length, quantity, and frequency of program participation respectively. There was not a significant correlation between the length of program participation and entry into a health profession. The results of the calculated odds ratio and confidence interval implies that the length of engagement in the HCA program is not an indicator of whether the participant will enroll in a health professions program.

Table 3

Comparison of Graduation Rates and Length of Participation, 2006 - 2010

			Program Participation Length Months					*Total*
			<1	*1-20*	*21-40*	*41-60*	*>60*	
Graduated Health	*No*	*Count*	*40*	*85*	*58*	*5*	*1*	*189*
		% within Graduated Health	*21.2%*	*45.0%*	*30.7%*	*2.6%*	*0.5%*	*100.0%*
		% of Total	*16.3%*	*34.6%*	*23.6%*	*2.0%*	*0.4%*	*76.8%*
	Yes	*Count*	*10*	*28*	*19*	*0*	*0*	*57*
		% within Graduated Health	*17.5%*	*49.1%*	*33.3%*	*0.0%*	*0.0%*	*100.0%*
		% of Total	*4.1%*	*11.4%*	*7.7%*	*0.0%*	*0.0%*	*23.2%*
Total		*Count*	*50*	*113*	*77*	*5*	*1*	*246*
		% within Graduated Health	*20.3%*	*45.9%*	*31.3%*	*2.0%*	*0.4%*	*100.0%*
		% of Total	*20.3%*	*45.9%*	*31.3%*	*2.0%*	*0.4%*	*100.0%*

Table 3. Cross Tabulation Analysis

Of the full population, N=246, the majority of participants, 28 (11.4%), participated in program activity between one and 20 months, 38 (15.4%) completed ≤ 50 hours of activity, and 51 (85.4%) completed between one and 15 distinct activities.

Table 4

Comparison of Graduation Rates and Frequency of Participation, 2006 - 2010

			Participation Length in Months					
			<1	*1-20*	*21-40*	*41-60*	*>60*	*Total*
Graduated Health	No	Count	40	85	58	5	1	189
		% within Graduated Health	21.2%	45.0%	30.7%	2.6%	0.5%	100.0%
		% of Total	16.3%	34.6%	23.6%	2.0%	0.4%	76.8%
	Yes	Count	10	28	19	0	0	57
		% within Graduated Health	17.5%	49.1%	33.3%	0.0%	0.0%	100.0%
		% of Total	4.1%	11.4%	7.7%	0.0%	0.0%	23.2%
		Total Count	50	113	77	5	1	246
		% within Graduated Health	20.3%	45.9%	31.3%	2.0%	0.4%	100.0%
		% of Total	20.3%	45.9%	31.3%	2.0%	0.4%	100.0%

Table 4. Cross Tabulation Analysis

Comparatively, the levels of participation by study participants who graduated from health-related degree programs parallels that of non-health graduates. Of the health-related graduate population, n=57, a majority of participants, 28 (49.1%), participated in program activity between one and 20 months, 38 (66.7%) participants completed ≤ 50 hours of activity, and 51 (89.5%) participants completed between one and 15 distinct activities. The lack of a control group limits these findings to a comparison of students who participated in the HCA program, and does not allow for an assessment of the impact of the program itself.

Table 5

Comparison of Graduation Rates and Quantity of Participation, 2006 - 2010

			Activities			
			1-15	6-10	11-15	16-20
Graduated Health	No	Count	159	24	5	1
		% within Graduated Health	84.1%	12.7%	2.6%	0.5%
		% of Total	64.6%	9.8%	2.0%	0.4%
	Yes	Count	51	4	1	1
		% within Graduated Health	89.5%	7.0%	1.8%	1.8%
		% of Total	20.7%	1.6%	0.4%	0.4%
Total Count			210	28	6	2
		% within Graduated Health	85.4%	11.4%	2.4%	0.8%
		% of Total	85.4%	11.4%	2.4%	0.8%

Table 5. Cross Tabulation Analysis

A binomial logistic regression analysis helped to determine if a relationship existed between the extent of program participation and graduation from a health-related

graduation population. For this analysis, the coefficients of length, quantity, and frequency of program participation categorized the independent variable of extent. Examination of the matriculation frequency revealed that of the n=78 (31.7%) participants who completed an undergraduate degree, 57 (73.1%) completed a health-related program of study.

A test of the full model against a constant model was not statistically significant. Chi square had 3 degrees of freedom, a value of 3.267, and a probability of $p > .0001$, which indicated a good fit. The Wald criterion of.189 for length, .747 for quantity of participation, and .573 for amount participation does not demonstrate that either coefficient made a significant contribution to the rate of health-related graduation. An analysis of the data did not find quantity of participation ($p = .096$), length of participation ($p = .664$), nor frequency of participation ($p = .449$) to have a statistically significantly association with student matriculation, or contribute to the prediction.

Research Question 2 (RQ2) and Analysis

RQ2. Is there a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among ethnic minority students?

$H_0$2: There is not a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among ethnic minority students.

H_A2: There is a statistically significant relationship between the type of HCA program participation and the successful matriculation through health care education programs among ethnic minority students.

Analyses of data assessed for the presence of correlation between health-related graduation rates and module participation existed. Measures of central computations summarized the data for the type of program participation variable. Measures of dispersion computations aided in gaining an understanding of the variability of scores for the coefficients of (a) completion of HCA modules with no extended involvement, (b) module completion with service learning involvement, (c) module completion with experiential learning involvement, and (d) module completion with both service learning and experiential learning involvement. The following are the results of this analysis: Module completion [M=1.378, SD=.778], module and service learning [M=1.12, SD=0.86], module and experiential learning [M=1.67, SD=1.24], and module, service, and experiential learning [M=3.49, SD=5.17].

Based upon the calculated mean of the coefficients, it appears that on average, the central tendency of the population, N=246, was to complete < 1.5 HCA module hours, < 1.5 hours of combined module and service learning activity, < 2 hours of combined module and experiential learning activity, and < 3.5 hours of combined module, service learning, and experiential learning activity. The standard deviations of < 1 found in the analyses of the module and the module combined with service learning coefficients indicates high reliability for consistency. However, the larger standard deviation found in the combined module, service learning, and experiential learning coefficient indicates

low reliability or error in the measurement; thereby, signifying a lack of consistency found within the data. Analyses to assess the influence of the coefficient variable on health-related graduation rates provided an outline of the findings are as follows.

An examination of the frequency analyses results found that a majority of the population, 183 (74.39%), completed ≤ 10.0 hours of HCA module instruction; 229 (93.1%) participated in ≤ 10.0 hours of service learning hours; and 196 (79.7%) ≤ 25 hours of experiential learning activity. The odds ratio for the HCA module coefficient was .310 with a 95% confidence interval of [.128, 14.528]. A cross tabulation analysis comparison of graduates (n=78, 31.7%) with health-related graduates (n=57, 23.2%) assessed the relationship with the type of program participation. A review of the findings indicated that with a likelihood ratio of .007 ($p < .05$), an association between the completion of HCA modules and completion of a health-related degree is not statistically significant. The findings of the analyses imply that the total number of HCA module completion is not an indicator of participant enrollment in a health professions program.

Conducted analyses assessed the influence of experiential learning on health-related graduation rates. Nominal regression assessed the odds ratio for the experiential learning coefficient as 1.013 with a 95% confidence interval of [.773, 1.329]. Cross-Tabulation analysis indicated that 80.7% of the health-related graduate sub-group did not engage in experiential learning activity. Because 83.3% of the cells had an expected count less than five, deemed the assumption as violated. The likelihood ratio of .096 ($p > .05$) does not indicate an association between experiential learning and health-related graduation.

Review of these finding implies that participation in experiential learning HCA activities does not indicate an increased likelihood of enrollment in a health professions program.

The service learning coefficient for health-related graduation was 1.672 with a 95% confidence interval of [.243, 11.522]. Cross-Tabulation analysis indicated that 89.5% of the health-related graduated subgroup completed ≤ 10 hours of service learning activity. Because 70% of the expected counts less than five, the likelihood ratio of 1.28 ($p \geq .05$) indicated no association between service learning and graduation. Review of these finding implies that participation in service learning activities within the HCA does not indicate an increased likelihood of enrollment in a health professions program. Nominal analyses found the odds ratio for the HCA module, service learning, and experiential learning coefficient was 1.069 with a 95% confidence interval of [.120, 21.587]. Cross-Tabulation analysis indicated 68.4% of the members of the health-related graduation population completed ≤ 10 hours of combined activity. 84.1% of cells had an expected count less than 5, the likelihood ratio of .020 ($p < .05$) indicated a statistically significant association between the combined completion of modules, service learning, and experiential learning activity and post-secondary graduation. The variables of completed modules, service learning hours, and experiential learning activity independently, do not indicate a significant relationship with post-secondary graduation; however, when combined they have greater impact on students entering and graduating from a post-secondary program of study.

Conversely, a test of the full model against a constant model was not statistically significant. The regression model explained 9.8% (Nagelkerke R^2) of the variance of

completion of a health-related degree and correctly classified 76.8% of the cases, indicating a moderately strong relationship between the predictors and the prediction. Chi square had 5 degrees of freedom, a value of 16.429, and a probability of $p > .0001$, which indicated a good fit. As depicted in Table 4, the Wald criterion does not demonstrate that either coefficient made a significant contribution to the rate of health-related graduation. None of the coefficients of (a) module participation with no extended involvement ($p = .411$), (b) module participation with service learning involvement ($p = .078$), (c) module participation with experiential learning involvement ($p = .561$), and (d) module participation with both service learning and experiential learning involvement ($p = .591$) contributed significantly to the prediction. The lack of a control group limits these findings to a comparison of students who participated in the HCA program, and does not allow for an assessment of the impact of the program itself.

Table 6

Type of HCA Participation, 2006 - 2010

								95% C.I. for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1a	Module Participation	-.697	.847	.676	1	.411	.498	.095	2.622
	Module + Service Learning	-.216	.774	.078	1	.780	.806	.177	3.675
	Module + Experiential Learning	-.441	.758	.339	1	.561	.643	.146	2.843
	Module + Service + Experiential Learning	.409	.759	.290	1	.591	1.505	.340	6.667
	Constant	-.030	.455	.004	1	.947	.970		

Table 6. Summary of Logistic Regression

A review of the health-related graduate data analyses did not find the presence of correlation between the type of program participation and enrollment in a health professions education program. Accepting the null hypothesis. The type of HCA program participation did not find a statistically, significant correlation to the completion of a health-related education program among racial minority students was not identified. A review of the findings implies that in response to Research Question 2, the type of HCA participation does not influence a students' enrollment in a health professions program.

Research Question 3 (RQ3) and Analysis

RQ3: Is there a statistically significant relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students when controlling for (a) gender, (b) profession, and (c) region?

$H_0$3: The relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among ethnic minority students does not vary with respect to (a) gender, (b) profession, and (c) region.

H_A3: The relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among ethnic minority students does vary with respect to (a) gender, (b) profession, and (c) region.

Performance of a logistic regression determined if the extent and type of HCA program participation on matriculation into and through health professions education

varied by gender, profession, or region. The regression analysis showed that 100% (Nagelkerke R^2) of the variance in health-related graduation rates and correctly classified 76.8% of cases. The model found the chi square to have 7 *df*, a value of .000, and a significance level of $p > .05$. As depicted in Table 7, the Wald criterion analysis does not indicate that gender, profession, or region has any influence on the extent and type of program participation in relation to the matriculation of HCA program participants into and through health professions education.

Table 7

HCA Participation by Gender, Profession, and Region, 2006 - 2010

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Female (Gender)	-.467	5061.993	.000	1	1.000	.627	.000	.
Professions Category			.000	12	1.000		.000	.
Nursing	39.777	4724.976	.000	1	.993	1884292866649297504.0	.000	.
Medicine	41.671	28393.786	.000	1	.999	1251044749408481540	.000	.
Dental Medicine	76.727	24381.897	.000	1	.997	2.100E+33	.000	.
Rehab Sciences	75.323	10502.118	.000	1	.994	5.158E+32	.000	.
Pharmacy	77.587	29079.720	.000	1	.998	4.960E+33	.000	.
Lowcountry Region	36.002	6047.854	.000	1	.995	4318601426804186.000	.000	.
Mid-Carolina Region	35.855	6147.186	.000	1	.995	3731125934575024.000	.000	.
Pee Dee Region	35.270	8410.434	.000		.997	2076886968532907.000	.000	.
Constant	-56.131	7917.885	.000	1	.000			.

Table 7. Summary of logistic regression

A review of the data analyses found neither the coefficient of gender, profession, or region to statistically significantly influence health-related graduation rates; thereby, proving the null hypothesis. Gender, profession, or region did not impact the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students.

Conclusion

An emergence of correlation trends from the data based upon anecdotal evidence of matriculation into health professions by participants within the 2006 - 2010 cohort was anticipated. The analyses of archived data within this study, however, did not identify any statistically significant relationship between, or influences on the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students. The findings imply that neither the total number of module and hours, nor the completion of activity by type participants of the HCA program, indicate the probability of enrollment in a health professions education program. It is important to note that the lack of a control group limits these findings to a comparison of students who participated in the HCA program, and does not allow for an assessment of the impact of the program itself.

Persisting enrollments by members of the cohort may alter future data analysis findings. A review of findings of a frequency analyses of data collected from the AHEC and National Student Clearinghouse databases using SPSS indicated that 37.3% of participants remained enrolled in a health-related, undergraduate program. As the

frequency and percentage of HCA participants who graduate from post-secondary education programs increase over time, the potential for an emergence of participation patterns that correlate with health-related graduation rates remains.

Ultimately, the lack of an effective and continuous process for data collection and evaluation impeded opportunities for review and refinement of the program. Despite the lack of correlation between the data points within this study, the number of health-related graduates supports a presumption of value added to the development of its participants. There is a presumption that the personal development, career exploration, and professional preparation needs of the program participants are just as diverse as the participants themselves.

An additional study will aid with fully assessing the impacts of HCA program participation. A continuation of this study, with the collection of participant and stakeholder perceptive feedback, should provide the information necessary to rationalize a plan for comprehensive evaluation. Section 3 presents a white paper that outlines approaches to establishing data-driven structures and processes for the planning, development, and implementation of longitudinal intervention programs.

Section 3: The Project

Introduction

As outlined in Section 2, the data results did not allow me to determine whether HCA program participation influenced students in subsequently becoming health professionals. Analysis of the data collected demonstrated no significant relationship between the extent and type of HCA program participation and the successful matriculation through health care education programs among racial minority students. In Section 3, I present an overview of the development of the project of this study. A rationale for the project, project goals, and a literature review is comprised in this section. The literature review includes a summary of strategies for establishing data-driven environments that support the design, delivery, and refinement of programs created to promote the development of URM students. In this summary, I also include elements for the effective construction of a white paper for the dissemination of information.

The white paper, found in Appendix A, includes a summary of the findings of this research for the intention of promoting an understanding of the issues related to addressing the diversity of health care workforce as described in Section 1. Included are six strategic approaches presented to create the capacity for the development and refinement of longitudinal, student development programs for improved outputs. The strategies, as presented, underlie the need for effective programs that prepare more URM health care professionals to address the health care needs of a more diverse population.

Rationale

In conducting my research, I found a lack of data necessary to establish a clear understanding of the relational impacts of the HCA on participant academic matriculation. The lessons I learned as the result of carrying out this study enabled me to develop best practices in programming that target URM high school students. A review of the literature guided the establishment of recommendations for the review, revision, and expansion of the HCA data collection processes. I concluded placing focused attention on the levels of implementation, program participation, and participant satisfaction to promote an increased comprehension by the AHEC staff of the program's ability to affect URM entry into health professions education.

The white paper format strategically supports a broad distribution of content for the development of educational policy and is an increasingly acceptable method for sharing research with nonresearch communities (Porter, 2007). The white paper is an effective platform to disseminate the formulated recommendations, supported by the findings of this study. This will elucidate, - the improvement of processes in the implementation and evaluation of longitudinal youth programs. The format includes guidelines in response to the lack of data needed to assess the relationship between HCA participation and health education program admission as summarized in the data analysis subsection of Section 2. The white paper, which serves as the project component of this study, includes an executive summary of the purpose and use of data-driven environments for the delivery of effectively validated longitudinal, student development programs.

Review of the Literature

The literature review for the project component of this research focuses first on the uses and characteristics of a successful white paper. The search of main research terms (position paper, white paper, and reporting research) in varying order and combinations helped with the retrieval of scholarly articles via ProQuest and EBSCO Host databases. I used the Google and Google Scholar search engines to identify additional sources for a broader understanding of purpose, role, and characteristics of the position paper platform.

For the purposes of this review, the terms white paper and position paper are interchangeable. The review of the works retrieved from each search helped to ensure relevance in the development of the position paper associated with this study. Although ample published white papers were located through the search, a minimal number of peer reviewed literature were located that included details relating to the purpose for using the white paper as s a means to deliver research-based information.

The following literature summary begins with a definition and description of the characteristics of a position paper and its content. Also included is an examination of peer reviewed literature using a position or white paper format for the dissemination of information. The section concludes with a summary of my position supported by the findings of the related study.

White Paper Characteristics

The United Nations Association of the United States of America website includes information that defines the position paper as an essay that details policies that relate to a

specified topic (http://www.unausa.org/global-classrooms-model-un/how-to-participate/model-un-preparation/position-papers). Position papers are the required format for Model UN participation for the organization of thoughts and ideas in support of a national position (Feldman, 2017). Position papers are generally one-and-a-half pages in length and should provide facts in support of a proposal for resolution to a complex problem (Feldman, 2017). A good position paper can serve as the opening of a speech; it can also help a speaker to adhere to established policy during debate (Feldman, 217).

The issue prescribed in a position paper offers a distinct opinion that is arguable with facts and deductive reasoning. The Xavier University Library (2014) has identified three primary sections of a position paper: introduction, body, and conclusion. A summary of the issue and the author's position supported by evidence that validates the inclusion of the position in the introduction. The body section offers background of the issue, supporting facts, and a discussion of each side of the issue that examines and evaluates the position. The paper concludes with a summary of the main concepts, and suggested a course of action along with possible solutions (from http://www.xavier.edu/library/students/ documents/position_paper.pdf).

McAllister and Landen (n.d.) noted the frequent use of white papers within the science and technical contracting realm, and the increasing frequency of use in all fields. The format initiates a conversation on research content that primarily focuses on the academic and discipline-specific setting and relevance of the topic and project

(McAllister & Landen, n.d.). The essay does not require a large amount of methodology detail unless the project emphases are placed on practice (McAllister & Landen, n.d.).

Rus (2015) reported that the objectives and audience of technically written papers differs from that of generally written papers. The use of discipline specific jargon specializes the writing methodology of technical papers to suit the audience. The author outlined characteristics of technical documents, and outlines methodologies for the delivery of technical writing skills instruction (Rus, 2015). Functional writing should communicate the author's intention in a manner that allows the reader to "perceive what the author had in mind" (Rus, 2015, p. 1110). The author should accurately communicate the message by 1) knowing the audience; 2) clearly identifying the purpose of the paper – to inform, persuade, or instruct; 3) understanding the appropriate writing task; and 4) organizing ideas and materials. Clarity, brevity, simplicity, and planning are effective characteristics of a technical paper. The objectivity and higher use of formality associated with technical papers require the use of the active voice (Rus, 2015).

White papers are well reasoned and visually appealing documents strategically developed to coordinate support for an idea or concept (Powell, 2012). The white paper format is a platform used by a variety of professions to deliver research information in a variety of formats. King (2001; Powell, 2012) identified op-ed writings as the most thorough use of the position paper as a format for discussion. Public relations often receive instruction in the development and use of the white paper as an effective marketing tool. A well written white paper incorporates a highly reflective process, and

requires the writer to understand the associated trends of the profession to engage in the discussion.

Willerton (2013) noted the increased use of white papers in business and professional settings, and the limited availability of textbook resources to support learning experiences for students. The article revealed that the white paper concept emerged from England for conveying information on governmental policy. Where blue books were lengthy written explanations of government policy bound with blue covers, white papers were too short for bounding (Safire as cited by Willerton, 2013). White papers became more prevalent within the information technology sector during the 1990's, and more widely used within a variety of sectors (Willerton, 2013). Willerton (2013) provided guidance for the design of an assignment that engages students in composing white papers for community groups.

The use of the white paper format increased as a functional format for the delivery of information to increase knowledge and improve performance within a variety of sectors since its emergence during the 1990's (Lopresti, 2013). Lopresti (2013) cited the e-book as a more functional format for publication of a white paper. The electronic presentation offers a more effective mechanism to disseminate information while expanding the reach and ability of marketers to establish clientele (Lopresti, 2013).

Project Paper Exemplars

Bergman (2001) used the white paper format as a marketing tool to promote the use of the deep web to deliver comprehensive information to a targeted audience. The author cited the value of the white paper format as a worthwhile source to disseminate

research and data for individuals involved in e-publishing (Bergman, 2001). McGarrigle et al (2014) reported a discussion summary on listening effort and fatigue accompanied by international commentaries by audiology experts using a white paper. Included is an overview of the objective, design, and results. The authors cited the white paper format as the appropriate platform for an international discussion of a complex, multidisciplinary, and multi-dimensional topic (McGarrigle et al, 2017).

Golden et al (2015) published a position paper on aggressive refeeding approaches and the use of family based therapy as a psychological treatment for youth with anorexic nervosa. Facts compiled through a theoretical analysis of literature located through a MEDLINE database search supported the presentation of six positions and subsequent recommendations.

Roberts and Foster (2016) published a white paper that outlined guidelines for new teacher training in England. The paper included a summary of the preparation pathways and associated qualifications. Also included was a brief overview of governmental proposals to strengthen the qualifications for teacher accreditation that would replace the current Qualified Teacher Status accreditation. The purpose of this white paper was to deliver a compilation of relevant information for individuals involved and interested in the educational system of England. It supported the reader's ability to gain a comprehensive understanding of the current and proposed education training processes in a single document.

Pershing (2015) described the white paper as a professional writing style that uses fact and logic to persuade, promote, and recommend solutions for specific problems. The

author included suggestions of ideas that helps the reader to understand concepts, resolve issues, and improved performance (Pershing, 2015). The length of the white paper generally varies between 1,500 and 3,00 words, and often begins with defining the problem as supported by data and literature, then followed by a solution. The author encouraged the use of the white paper format to deliver strategies for performance improvement.

White and project papers often serve as a platform to deliver diverse content from various career fields. Harwood and Knight (2015) used the academic position paper format to present six positions for parenting expertise in relation to youth sports involvement. Quirce et al (2016) used the white paper to present a critical review of current literature and facts of hypersensitivity pneumonitis resulting from social environments. A position paper published to discuss the functionalities, challenges, and testbed characteristics needed to implement and test software defined network services (Blendin et al, 2014). Stolovitsky (2014) presented strategies commonly used by project managers to create project plans that effectively meet the needs of team members and stakeholders for the successful implementation and outcome of defined activities. Each example follows a similar outline. In addition to the abstract, the sections of the paper included an introduction and background of an issue, research methodology, results, related work, conclusions, and future work, summarizing key messages.

Stolovitsky (2014) provided guidance for the use of the white paper format for the associated project. Stolovitsky (2014) outlined the role of a project plan, common pitfalls and tips for project planning, and recommendations for implementation. The plan and the

project provided a guide for implementation. The plan should leverage existing resources, project templates, and best practices for a more effective use of effort and time (Stolovitsky, 2014). Stakeholder involvement promotes ownership throughout the development process to collaboratively guide the evolution and approval of a plan that each member is responsible regardless of outcome. Team members and stakeholders who are responsible for its execution should receive the relevant pieces of the approved plan. Stolovitsky (2014) identified three members of the team, or "users", who need to interact with the plan – project planners, project workers, and project stakeholders. The planner builds the plan and scheduling who assist with project implementation. The workers are the team members responsible for delivering and executing activities and benchmarks. The stakeholders are the decision makers, including organization executives and sponsors responsible for tracking and analyzing planning specifics toward production. Stolovitsky (2014) recommend the use of the web-based Gantt charting tool and Genius Planner as project management solution tools.

Haughey's (2014) suggested the use of eight factors for successful project management, and cites the project manager as holding ultimate responsibility for the delivery of a successful project. Also recommended was the implementation of factors for the strategic avoidance of common problems that undermine project success. The author emphasized leadership and communication as essential qualities for effective project management.

Education related white papers published by Education Journal (2016), The Schools (2016), Wall et al (2015), and several others were used to inform and persuade educational issues at the legislative level, both in the United States and abroad.

This review of literature provides a summary of the characteristics often incorporated in the development of academic white papers. The format widely aids in the delivery of information, guidance, and recommendations for increased knowledge or improved delivery of constructs for more effective outcomes; and is an effective means to present standards for practice resulting from the findings of this study as described in the following section.

The data analysis of this study revealed a lack of information needed to gain a broad understanding of the impacts of the HCA program. As summarized in Section 2, the data analysis failed to identify a correlation between the extent and type of participation and admission to a health professions program. However, details related to the "if" and "how" HCA participation impacts participants is unavailable due to ineffective data collection mechanisms and processes. The absence of this statistical information might lead to a misinterpretation of the analysis, potentially suggesting program ineffectiveness. Establishing an effectual understanding of the impacts of a program requires thoughtfully organized collection and analyses of data.

Ample research-driven literature is available to justify the benefit of a racially and ethnically diverse health care workforce for the delivery of competent care to an increasingly diverse population. Also available is literature that purport the value of and outcomes of student programs designed to promote that diversification. However,

minimal literature provides recommendations to guide the development, implementation, and evaluation of longitudinal programs designed to promote the academic matriculation of URM high school students into health professions education. Realizing the previously referenced pitfalls that can result in the presence of data gaps calls for the inclusion of literature, grounded by data, that offers guidance towards success.

The findings of this research, supported by available literature, guided the composition of the white paper that includes six strategic approaches with corresponding recommendations. Composition of the white paper, which serves as the project of this study, contributes to the availability of literature related to the implementation of effectual longitudinal programs that target URM students interested in health professions. Although the purpose is specific in its targeted audience, the information is applicable to the effective design, implementation, and evaluation of any youth development program.

Project Description

The white paper of this study, entitled "A White Paper: Key Approaches to Sustaining an Extended Learning Opportunity Program for Underrepresented Minority Students" (see Appendix A), includes a position, based upon the results of this study, for the sustainability of an effective longitudinal student development programming in a manner that helps to address the diversity of health care workforce as described in Section 1. Evidence from both the literature and the findings of this study promotes the sustainability of programming that effectively supports URM student matriculation into health profession education programs. Included is a description of the problem in the introduction, a summary of the data analyses and implications of the findings in the body,

recommendations that align with evidence that is relational for the intended audience as the conclusion, and references.

My analyses of data failed to identify a significant relationship between the extent or type of participation in the program and the health-related graduation rates of program participants between 2006 and 2010. Despite the lack of correlation between the data points within this study, the number of health-related graduates supports a presumption of value added to the participants' development, and assumes that the career development and career exploration needs of the program participants are just as diverse as the participants themselves.

The lack of comparative data as an evaluation measure of the associated study limited the type and levels of analyses performed within this study. The inclusion of comparative data and qualitative data may have provided a more comprehensive understanding of the level and type of program impact on the study participants. Furthermore, the availability of a control group for the purposes of comparison may have also offered greater insight. These reflective observations support the recommendation of seven strategic approaches for the evaluation and sustainability of student development programs.

The white paper provides seven, research based strategic approaches to guide the design of a data driven, longitudinal student development program to effectively promote URM student matriculation into the health professions pipeline. For the decision makers of longitudinal student development programs, the presented information uses the white paper format, due to its noting as a platform for delivering information in a manner that is

easy to understand. The recommendations are a process for program design and evaluation that will help to produce data that promote the effectiveness of programs.

Opportunities to promote social change require a sharing of the information compiled within this white paper. Appropriate dissemination involves the consideration of the target audience, and the most operative means to reach it. Towards this end, assessment of four factors helped to define the audience - proximity, authority, timeliness, and relevance (Graham, 2017).

- Proximity: The audience members' association to the author, and relationship to the subject matter.
- Authority: The level of proficiency of the author as perceived by the audience.
- Timeliness: The suitability of the information within the current environment.
- Relevance: The application of concepts and the significance of the supporting sources (Graham, 2017).

With this detail in mind, my goal is to present the white paper at the local and national levels to promote social change.

At the state level, project presentation has the potential for a more immediate impact on the development and implementation of an assess, review, and revise plan for the HCA. With a goal of improving the data collection and assessment processes, acceptance and implementation of the recommendations and guidance included in the white paper sought to support a deeper understanding of the impacts of the HCA in the academic and professional decisions of its participants, and ultimately the health care workforce in South Carolina. Decisions to implement major process modification occur

at the state level in collaboration with regional center leadership, which supports statewide implementation (D. Carson, personal communication, March 15, 2015).

Within 60 days of project approval, I will request an opportunity to present and discuss the white paper to the administrative team of AHEC. The intention is to ignite a strategic plan, incorporating the recommendations included in the white paper. The objective of the strategic plan will be to guide a collaborative enactment of a more data-driven environment that should culminate with a more effective evaluation of the HCA and the reporting of programmatic outcomes for the sustainability and allocation of fiscal resources.

I will pursue two platforms for dissemination at the national level – electronic publication and conference presentation. Opportunities for electronic publication lends the use of the platform to a broad dissemination of information. Academica.edu© is a social networking platform designed to publish and share research papers. Plans to publish this white paper via Academica.edu© will initiate within 90 days following receipt of feedback from the AHEC system. A Google© search found that the platform, launched in 2008, supports the instant sharing and monitoring of research, which allows the users of similar interest to browse for information shared by researchers from around the world. Keywords will provide to support search engine query. More than 36 million individual users visit the website per month (Acadamia.com, 2017).

Secondly, disseminating the white paper through reporting platforms sponsored by the National AHEC Organization expands the possible reach of the project for potential national utilization. I will submit an abstract during the bi-annual call for

abstracts for the 2018 NAO Conference scheduled to occur in Washington, DC in the winter of 2017. The NAO membership includes staffs of more than 300 program offices and centers, serving 85% the nation to improve the availability and distribution of health care professional (National AHEC Organization, 2015). The following section summarizes the plan for evaluation of the white paper for each dissemination format.

Project Evaluation Plan

Accountability, justification, and learning are basic measurements to assess the efficiency of activities, analysis effects, and identify strategies towards improvement (Makarova & Sokolova, 2014). As suggested by the Project Management Institute (as cited by Makarova & Sokolova, 2014), evaluation of this project approached a mixture of activities interlinked for creating a service that culminates with a distinct set of outcomes. The planned dissemination of this white paper includes evaluation processes distinct and specific to each delivery format. Each process intends to assess the utility of the white paper's content.

At the local level, the white paper will assess the level of utility in guiding the processes of review, assess, and revise for the HCA. The level of utility will be determined based on the attainment of four primary objectives: 1) the AHEC administrative team accommodates the request for presentation of the white paper, 2) at the conclusion of the presentation and discussion, AHEC accepts the recommendations of the white paper for implementation; 3) AHEC agrees to develop and facilitate a strategic plan with the goal of establishing a data driven environment that is collaborative, comprehensive, and cyclical, and 4) within four years following implementation of the

recommendations, AHEC will have a more comprehensive data set that will support an evaluative study of the HCA. The researcher will compile, review, and assess summative feedback from key AHEC stakeholders throughout the discussions and process associated with the attainment of each objective for the continuous improvement and refinement of the white paper prior to publication and submission of abstract. Review and assessment will focus on feedback related to the comprehension and functionality of the white paper and its content. Modifications of the white paper will occur accordingly in advance of e-publication and conference presentation at the national level.

The Academia.edu© social networking site provides the ability to monitor analytics to assess the impact of his / her research. Available quantitative data include the number of unique individuals that view the paper, which areas of the paper reviewed by the individual, and the city and country where the visitor is located (Academia.edu, 2017). The website provides summative data on the number of profile views, the number of paper views, the number of unique profile and paper views, and the number of recommendations received by the paper (Academia.edu, 2017). The option to capture general feedback and line-specific comments allows for the collection of formative, qualitative data.

If accepted, the 2018 NAO Conference presentation evaluation will consist of a post-administration of an electronic survey for summative evaluation using Survey Monkey©. Survey questions (see Appendix B) seek to ascertain the participants' thoughts on the project in relation to the factors of proximity, authority, quality, relevance, and utility.

A review and analysis of e-publication and conference presentation feedback will guide the completion of modifications for improvement of the white paper. Continual efforts to improve the white paper for refined clarity, strengthened utility, and increased functionality aids efforts to inform and impact decision makers on the development and execution of data collection and evaluation plans for positive social change.

Project Implications

The goal of the project is to deliver recommendations grounded in theory and research to establish policy for the design and sustainability of an operative health-related ELO program that target high school students. The report renews assessment capabilities for programs seeking to secure and maintain funding supported by data-driven outcomes. Policy recommendations seek to promote improved program results towards the development and preparation of URM students for entry into the health professions workforce.

The delivery of effective health-related ELO programs positively affects society. Increasing the number of URM health professionals anticipates addressing persistent health disparities, and improve the health status of increasingly diverse populations. Additionally, highly engaging students in well-defined, relevant, extra-curricular programming encourages the development of self-confident, and academically proficient individuals as contributing members of society. Implications of the project is to offer a foundation for the development of a validated template for the effective design, delivery, and evaluation for ELO programs, which translates into an increase in the number of adequately prepared URM students who enter the health professions pipeline.

The results of this study empowers the researcher to continue efforts to understand the use of data to address health care workforce issues. At the local level, the researcher can influence AHEC decision makers in the development of initiatives that are theoretically sound, substantiated by literature, and positioned for effective evaluation in the programs efforts to address health care workforce needs in South Carolina. Local and national data collection and analyses for modification of the white paper expands the researcher's knowledge of how to establish data driven foundations for effective program design and implementation deepens. Gaining a more comprehensive understanding of programmatic issues that evolve due to insufficient data empowers the researcher to collaborate and consult with other organizations on how to avoid and resolve data-based issues the inhibit program evaluation.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

The strengths of this project are the presentation of strategies with accompanying recommendations as a template for creating a data-driven educative environment. As the product of this study, the white paper offers AHEC decision makers a guide for the development of a thoughtfully designed program of learning for participants of the HCA. Project managers and development team members should gain a sense of the importance and value of an intentionally coordinated data collection process and plan for growth through analysis. The Literature Review section offers a sampling of ideas and recommendations that emerged from research studies and reports using the white paper format. This project is an attempt to expand the availability of information for longitudinal intervention programs whose staff struggle to attain and demonstrate outcomes. Stelzner (2010) defines the white paper as a tool by which to argue a position or solution to a problem.

Capitalizing on the availability of the web-based professional networking, using Academia.edu to publish the white paper may maximize the potential of reaching a broad audience of career development specialists. My plan to present my project at the NAO biannual meeting will allow me to reach a national audience whose mission is to increase the supply and distribution of a diverse health care workforce (retrieved from http://www.nationalahec.org/About/AHECMission.html). The audiences targeted by both Academia.edu and NAO appropriately align in proximity, relevance, and timeliness based on current socioeconomic environments.

Limitations surrounding the dissemination of this white paper center around its acceptance for electronic publication on Academia.edu and for presentation at the NAO. Publishing the document as a PDF file on the Internet limits the type of analytics available to assess reader interaction. Because a PDF is a stagnant document, a researcher is unable to capture the quantity of time or the number of pages a reader spends reviewing a paper. My lack of knowledge on how to effectively market the document may potentially impede dissemination of the project. Abstract submission for conference presentation does not guarantee acceptance for inclusion in the agenda.

Recommendations for Alternative Approaches

Delivering a professional development opportunity for program developers, directors, and managers offers an alternative project approach. The training might include an intensive experience that would create an effective evaluation plan that establishes (a) measures that align with the mission and needs of the organization, (b) diverse data collection and analysis processes to address the identified problem or issue, (c) active stakeholder engagement, (d) reporting methods, and (e) strategies for review and revision towards improvement. I anticipate the outcomes of this approach as helping to establish a stronger understanding of how to apply the recommended strategies and establish an infrastructure to conduct a broad evaluation study.

Another approach might include establishing a web-based portal that provides an overview of enrollment data of health education programs within South Carolina. Demographic data, submitted to a data depository by university research and institutional effectiveness departments, would include data points related to race, gender, ethnicity,

residence, academic (high school and college) enrollments, and first generation status. Access to searchable datasets might assist program managers in establishing effective measures of success for URM student enrollment in health education programs.

Scholarship, Project Development and Evaluation, and Leadership and Change

The value of questioning and looking beyond the surface of data for answers became increasingly apparent as I completed the process of data analysis. The lack of correlation identified within this study was initially discouraging. Looking beyond the surface of the data led to my assumption that different experiences may influence the motivation and career choices of the participants in different ways. The assumption sparked the revelation that the available data were insufficient for adequately determining program impact. This realization, along with the minimal availability of literature on program design and implementation, bolstered my decision to develop a white paper as the project for this study.

Implementation of my plan to report and discuss the findings of this study with the administrators of South Carolina AHEC, along with the publication and presentation of the associated project will help to increase my understanding of how to effectively use data to address health care workforce needs in South Carolina. In my presentation to the AHEC administrative team and regional center directors, I will use the strategies outlined in the white paper to recommend a guided review and revision of the data collection processes of the HCA as well as a review of the content and its delivery. Using the findings of this study, I will work to locally influence the decision makers of AHEC in the development and implementation of future initiatives designed to affect health care

workforce issues in South Carolina. I anticipate receiving feedback through the electronic publication and conference presentation of the white paper. I further anticipate that the review and analysis of feedback will help me to improve the white paper. Continuing to improve the paper to address the needs of readers will better enable me to aid organizations in developing data driven programs.

While working on this project paper, I became more aware of the importance of attending to detail. Writing the literature review refined my organizational skills, reflection, and critical thinking abilities. As an emerging scholar, I began to apply these skills more intricately in the development of projects, programs, and courses to provide a richer experience for partners, participants, stakeholders, and program facilitators. Of greater personal value, I am now a more engaged learner and have more confidence as an administrator, instructor, and presenter when relaying information and developing content related to the development of students, particularly URM students, for entry into the health professions.

A white paper is the most effective method to share the findings of this study and literature-based recommendations for improvements in the field. My opinion, based upon a review of literature, is that the genre is less intimidating and more accessible to individuals involved in the work of URM student development beyond the field of research. The recommendations and evaluation tool outlined in this white paper are simplistic, but provide mechanisms for continued review, assessment, and revision designed to strengthen programs that target URM students preparing to enter health professions for improved and increased outcomes.

Reflection on Importance of the Work

My analyses of the data of this study found that a correlation between the length, type, or quantity of HCA program participation and successful matriculation into health professions does not exist. Reflecting on the findings, I determined that the lack of appropriate data limited my ability to adequately determine if the program has any level of influence on participant matriculation and career choices. Noted that 157 (64.2%) of my study population remain enrolled in an undergraduate education program at the time of this study indicated that the possibility of graduating and completing a health-related education program remained at that time.

The white paper provides strategic approaches to guide the design of a data driven, longitudinal student development program to effectively promote URM student matriculation into the health professions pipeline. Dissemination of this project can help to potentially catalyze cycles of improvement for future iterations of the HCA as suggested by the Demming Cycle (Syed, 2009). Demming (as cited in Syed, 2009) describes the benefit of planning, doing, checking, and enacting continuously over time for quality improvements. This theoretical framework promotes the engagement of employees in the planning and implementation of programmatic growth and improvements (Syed, 2009).

With a goal of improving the data collection and assessment processes, the implementation of recommendations included in the white paper may encourage a deeper understanding of the impacts of the HCA in the lives and decisions of program participants, and ultimately the health care workforce in South Carolina. Disseminating

the white paper through previously noted platforms offers opportunities for potential utilization at the local, state, and national levels.

Implications, Applications, and Directions for Future Research

An examination of the strengths of this research, project limitations, implications, applications, and direction for future research concludes this section. My analyses of the findings are an implication of the need to assess, review, and revise HCA data collection and analyses processes to adequately determine if a relationship exists between program participation and entry to health professions. The primary implication that emerged is the necessity of longitudinal programs to function within data driven environments. Obtaining rich and complete data sets enables a more productive program implementation and analysis of the HCA and similar programs.

Future research opportunities are dependent upon responses to the findings of this study. Pending the outcome of proposed presentation, discussions, and strategic planning with the South Carolina AHEC administrative team, based upon these findings, I anticipate a revision of data collection goals and processes for the HCA. The anticipated provision of more comprehensive data resulting from this type of revision presents opportunity for future research of the HCA at the state and local levels. Repetition of this study with an anticipated expanded, and more comprehensive data set, could lead to improved knowledge and understanding of the HCA and its content for improved practice and outcome within the state of South Carolina.

Similarly, with abstract approval and project presentation at the NAO conference, future opportunities for research may emerge in partnership with the NAO to conduct a

comparative data analysis of high school health career programs facilitated by AHECs from multiple states. Results of a multi-state research study may offer empirical evidence that structurally improves the delivery of longitudinal intervention programs that target URM students.

Both opportunities for future research, though dependent on the responses of the targeted organizations, are suitable for broadening the availability of literature and data related to 1) promoting URM student academic matriculation into health professions, and 2) health care workforce force issues. Ultimately, there is a potential to help further drive a progression for social change that impacts health care workforce issues, and ultimately socially determined health disparities at the local, state, and national levels.

Conclusion

The application of research drives the purpose, collection, analysis, and reporting of data. Cyclical assessment, review, and revision validates a program's reliability and credibility as a contributor to the achievement of URM students.

Four components of this study emerged:

1. A definition of challenges historically faced by longitudinal intervention programs that target URM students emerged with a clear association with economic and social implications.
2. Preparing and motivating the diverse needs of program participants assumes the delivery of diverse and varied experiences as a program requirement.
3. Standards for infrastructural design are essential to establish standards of best practice for genre improvements and a delivery of outcomes.

4. A position was established with recommendations and guidance to address that need.

Reflections, as an emerging scholar, solidifies my continued interest to further contribute to the availability of empirical data towards alleviating the health care workforce disparities faced at the local and national levels. The results of this study, supported by available literature, substantiated my reasoning for composing a white paper contributes to the availability of literature related to programs that target URM matriculation into health profession education programs. The experience yielded from the research, and knowledge gained, warranted a need for action. The white paper that emerged as the project of this study intendeds to empower readers to enact literature driven actions for improved change.

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Appendix A: The Project

A White Paper: Key Approaches to Developing, Evaluation, & Sustaining Intervention Programs that Target Underrepresented and Underserved Students

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Executive Summary

The health professions pipeline is what produces the nation's health care workforce. A crucial point in the pipeline is the development and preparation of students to enroll into post-secondary education and subsequent health profession education programs. The progressing age of the baby boom generation, citizens born between 1946 and 1964, places an increasing strain on the nation's health care system (Carnevale et al, 2012). The health care workforce will require a projected 5.6 million health care workers to join the workforce by the year 2020 to adequately care for the nation's increasing aging population (Carnevale et al, 2012). However, there is also a projected shortage of 91,000 primary care practitioners (Kirch et al, 2012).

The growing ethnic and racial diversity of the American population further impacts health status and the delivery of care. The increase in the representation of minority populations calls for an increase in the development of culturally competent practitioners for the delivery of culturally competent care. The Sullivan Commission on Diversity in Health Care Workforce report released in 2004 (as cited by Evans et al, 2013) highlighted the value of a health care workforce that reflects the racial and ethnic make-up of the population to address persistent health and health care disparities that are racially prevalent.

Health career exploration and development programs for students interested in health-related careers have been available for several decades. A health career development program initiated to target underrepresented minority groups during the mid-1970s sought to diversify the health care workforce to better serve emerging health

disparities in South Carolina. The most recent iteration of programming began in 2002. Adequate time has lapsed to support a review of program outputs for program improvements and modifications.

The Problem

African Americans remain notably underrepresented in South Carolina's health care profession degree programs (Lacey & McCleary, 2012). An analysis of available enrollment management data of the two largest and oldest multi-disciplinary primary health care training programs in the state showed slight diversity gains in health profession program enrollments.

The professional literature in health care education identifies longitudinal extended learning opportunity (ELO) and enrichment programs (health care career pipeline programs) as an effective strategy to foster the progression of underrepresented minority students into health care degree programs (Byars-Winston, 2014). Weischadle (2012) presented research that demonstrates the value of ELO programs in addressing social and educational barriers. The study noted the ability of ELOs to provide additional time and opportunity outside of the classroom to assist students in meeting academic standards (Weischadle, 2002). Adams and Price-Lea (as cited by Pollard et al, 2010) identified the engagement of students at the primary and elementary education levels as a strategy to recruit URM students to health professions. The talent development approach offered by pipeline programs can often off-set the lack of opportunity to explore, transform, and prepare the career potential of URM students (Byars-Winston, 2014).

The availability of statistical evidence that indicate the limited extent and manner in which ELO programs that target URM students may foster intended goals. Providing evidence-based outcomes is a challenge for many programs per the lack of regular and systematic data collection needed to evaluate the success of pipeline programs to promote student development and preparation, specifically those designed to increase the supply of minority health professionals (McGee & Fraber, 2009).

Longitudinal health career pipeline programs consider fostering the progression of minority students into and through health professions education programs as an effective strategy (Byars-Winston, 2014). The value of pipeline programs, acknowledged in the literature for addressing social and educational barriers that often prohibit the successful matriculation of racially underrepresented populations (Weischadle, 2002), provide extracurricular opportunities that promote academic achievement (Weischadle, 2002). The lack of established principles to guide the development and evaluation of longitudinal intervention programs thwarts the collection of knowledge for the appraisal and improvement of existing programs (Moscoso et al, 2013). The goal of this paper is to provide basic essentials and shared characteristics to help guide the identification of needs, goals, and evaluation processes for the development and sustainability of an effective extended learning opportunity program.

The data and insight that support the development of this white paper results from a study that arose from an interest to determine what, if any, impact participation in a specific longitudinal health career exploration program influences the matriculation of underrepresented minority students into the health professions workforce in South

Carolina. Driven by the availability of ample anecdotal matriculation success, the lack of understanding "how" a student benefits from participation in the program impeded the ability to best guide programmatic growth and evolution of the program for the most effective outputs and continual growth.

Study Overview

The purpose of the associated project study, "*Assessing the Effect of a Statewide Health Careers Exploration Intervention Program for Evaluation"* (Christie, 2017), was to assess the extent and type of program participation that may foster the matriculation of URM high school students into and through health care degree programs, and into health care professions. Toward this end, the study accessed archived program data to identify the type of program activities and duration of involvement of program participants. Retrieval of pre-existing health care education and workforce matriculation data identified the end-point of program participant's matriculation toward the health care profession.

Significance of the Study

The results of the assessment contribute to efforts intended to address the disparate representation of ethnic and racial minorities who successfully matriculate into and through health care degree programs, and into health care professions. Specifically, as this analysis examined the extent and type of program participation in association with the degree of student matriculations into and through health care education programs and into health care professions, the results of this analysis sought to shed light on effective and less effective program components and practices. This study provided empirical

evidence to support the sustainability and success of the identified program, the disparity of racial minorities in the health care field, and the projected need for racial minorities in health care professions.

The archived data looked for corresponding matriculation data retrieved from the National Student Clearinghouse database. A trend analysis using Sequential Logistic Regression procedures assessed the relationship between the type and extent of program participation and the matriculation status of underrepresented minority students. Specifically, as this analysis examined the extent and type of program participation associated with the degree of student matriculation into and through health care education programs and into health care professions, the results of this analysis shed light on effectiveness of program components and practices.

Guiding Research Questions

While racial minority students have similar health care career aspirations as White students, economic and educational achievements impede the development of the skills, behaviors, and dispositions needed to successfully matriculate into health care degree programs and into health care professions (Aurora, Schneider, Thal & Meltzer, 2011). The program design specified in the research study sought to overcome these barriers and, in turn, foster the successful matriculation of URM students into and through health care degree programs and into health care professions. This project study sought to answer three questions:

1. Is there a statistically significant relationship between the extent of program participation and the successful matriculation through health care education programs among ethnic minority students?
2. Is there a statistically significant relationship between the type of program participation and the successful matriculation through health care education programs among ethnic minority students?
3. Is there a statistically significant relationship between the extent and type of program participation and the successful matriculation through health care education programs among ethnic minority students when controlling for (a) gender, (b) profession, and (c) region?

Drawing on the theory of the aligned ambitions framework of Schneider and Stevenson (as cited by Sabates et al, 2011), the associated study intended to determine the if the presence of a relationship between HCA participation and graduation from a health professions program existed. The determination was based on measuring the *extent* and *type* of program participation using existing or archived HCA program data. Within the available program data, an examination of the number of months (duration), activities, and hours (quantity) of participation helped to determine the extent of involvement, and the examination of the kind of activity determined the type of involvement.

The results of this assessment contributed to efforts intended to address the disparity of racial minorities who successfully matriculate into and through health-related degree programs, and to shed light on the more effective and less effective components and practices of the identified program. These insights will serve as a baseline of future

program improvement efforts. As this study provided empirical evidence to support the sustainability and success of the program, the insights guided the development of recommendations for the reader's consideration to support the sustainability of extended learning programs with similar goals.

Summary of Findings

Assessment of the extent and type of HCA program participation in fostering the matriculation of URM high school students into and through health care degree programs and into health care professions guided the fundamental collection and analysis of data.

Research Question 1. Is there a statistically significant relationship between the extent of program participation and the successful matriculation through health care education programs among racial minority students?

The independent variable of extent, categorized by the coefficients of a) length of program participation, measured by the total months of participation, b) quantity of program participation, measured by the number of participation hours, and c) frequency of program participation, measured by the number of activities participated, supported this analysis. The analysis of health-related graduate data suggested that the extent of program participation does not correlate with graduation from a health professions education program. There is not a statistically significant relationship between the extent of program participation and the successful matriculation through health care education programs among racial minority students.

Research Question 2. Is there a statistically significant relationship between the type of program participation and the successful matriculation through health care education programs among racial minority students?

The independent variable of type, categorized by the coefficients of (a) module participation with no extended involvement, (b) module participation with service learning involvement, (c) module participation with experiential learning involvement, and (d) module participation with both service learning and experiential learning involvement, guided this analysis. The analysis of health-related graduate data suggested that the type of program participation does not correlate with graduation from a health professions education program. There is not a statistically significant relationship between the type of program participation and the successful matriculation through health care education programs among racial minority students.

Research Question 3. Is there a statistically significant relationship between the extent and type of program participation and the successful matriculation through health care education programs among racial minority students when controlling for (a) gender, (b) profession, and (c) region?

The study examined for the presence of a correlation between the coefficient of gender, profession, and region and the health-related graduation rates of the program participants. The data did not predict any probability of graduation occurring based upon either of the coefficients. The relationship between the extent and type of program participation and the successful matriculation through health care education programs

among racial minority students does not vary with respect to (a) gender, (b) profession, and (c) region.

Overall, the analyses failed to identify a significant relationship between the extent or type of participation in the program and the health-related graduation rates of program participants between 2006 and 2010. It is important to note, however, that continued enrollments of program participants may alter the findings of future analysis. A frequency analysis indicated that 37.3% of participants remained enrolled in a health-related program at the time of the study. When combined with participants that graduated from a health professions education program, 60.1% of participants may potentially graduate with a degree in health.

Reflection

Despite a lack of correlation between the data points as defined within this study, the number of health-related graduates identified through the data analysis supports a presumption of value added to a student's development as a result of program participation. A presumption that the career development, career exploration and developmental needs of the program participants are just as diverse as the participants themselves emerged.

The lack of comparative data as an evaluation measure of the study limited the type and levels of data analyses needed to support this study. The inclusion of comparative data and qualitative data would have provided a more comprehensive understanding of the level and type of program impact on the study participants. Furthermore, the availability of a control group for the purposes of comparison may have

also offered greater insight. These reflective observations support the recommendation of the strategy approaches for the evaluation and sustainability of student development programs that follow.

Strategy Approaches & Recommendations

Numerous studies demonstrate the value of pipeline enrichment programs. Education enrichment programs, or extended learning opportunities, are available outside of the classroom to address academic gaps (Smith et al, 2009). Globally, the creation of ELOs were to address limited funding available to support the fiscal implementation of school-based science education (Winkleby et al, 2013). ELOs offer valuable supplement to in-class instruction that focus on educational activities to promote student achievement despite the presence of socioeconomic and cultural barriers (Weischadle, 2002). Pipeline, enrichment, and other social programs designed to diversify the health professions pipeline are important to improving underrepresented student preparation for academic readiness and preparation for health professions education and training (Smith et al, 2009). Pipeline programs can specifically address workforce diversity issues, educational opportunity gaps, and help to reduce health disparities (Smith et al, 2009).

Driven by the results of this study, and with the underlying presumption of a requisite of diverse developmental needs, presented are key approaches to developing, evaluating, and sustaining student development programs that target underrepresented and underserved students. Also presented are seven strategic approaches with corresponding recommendations for the comprehensive design, implementation, and

evaluation of activity to promote the successful matriculation of underrepresented minority students into, and through, health professions education programs.

Strategic Approach 1: Planning & Analysis – Know the audience

Planning the design of an effective longitudinal student development programming begins with data evaluation. Although current literature theoretically advocates the value of longitudinal programming, program design and delivery without frequent and continuous evaluation undermines program validity and efficacy. Comprehensively integrating the use of diverse data, data collection, and data analysis methods establishes a foundation of efficacy for planning the design, delivery, and evaluation of program content and programmatic outcomes. Setting the stage for informed planning diminishes the potential for misguided and ineffective development.

Gaining a systematic understanding of the knowledge and abilities needed for the successful academic matriculation of the audience, and defining what gaps exist and contributors to those gaps within the defined audience is essential to designing an effective educational program (McCawley, 2009). In other words, learning what the audience knows and thinks defines the services needed and the best way to deliver those services. Considering participant needs, available resources, program policies, performance measures, administrative supports, and community assets in the initial stages of planning focuses the assignment of effort and the use of resource (Rooney et al, 2015).

Data collection and analysis at the design stage should focus on defining the needs of the targeted audience, and identifying the existence of gaps in service within the current landscape as the foundation for the establishment of goals, objectives, and

benchmarks that guide all measures of success. The inclusion of quantitative assessments of learning and qualitative assessments of growth and perceptions of impact guided by the established goals, objectives, and benchmarks helps with the creation of an effective evaluation process.

Recommendation: Formulate questions and hypotheses based on the defined problem, issue or concern.

Recommendation: Convene a program development team of key stakeholders and partnering organizations to oversee a design and implementation process to address the defined problem, issue, or concern

Recommendation: Conduct a needs assessment - the process of identifying and addressing discrepancies that exist between current and preferred conditions in relation to a specific issue. Collecting and assessing the needs of the targeted population further authenticates the development of a research-based model for implementation. A thoughtfully performed needs assessment starts with a review of research literature. and continues with gathering information from clientele.

The development team should conduct an exhaustive review of literature. An analysis of relevant, current research data will help to establish a clear understanding of the needs of the audience, and how to make available services most accessible, acceptable, and useful. Conducting interviews, focus groups, and surveys are suitable strategies for the collection of insightful data. Accessing student perceptions is essential to developing informed practice. Consider cultural, societal, and economic indicators that

may compel or impede student achievement to promote the most impactful outcomes (Condoli & Pelavin Associates, 1992).

Strategic Approach 2: Collaborate – Identify and engage partners for a comprehensive experience

The theory of community involvement justifies the value of collaboration in the functioning and overall well-being of learners (Sanford, 2003). It is appropriate to contend that collaborations should be inclusive of formal and informal partnerships, and not limited to business and industry. As the educational stakeholders, community members can contribute to the success of a student development program. The collaborative involvement of parents, educators, grassroots, business, faith-based, and political entities can prove essential in the cultivation of ownership – the constituency of the innate desire for success. Engaging stakeholders in the design and implementation of the learning community will foster an environment of mutual dependency and increase the potential to leverage available resources.

Partnering with community organizations and business/industry often enhances the relevance of program content by matching the diverse interests and talents of the program participants to promote authentic learning. Community partners can ease efforts to create a fully dimensional participant experience that focuses on academic and professional competency (Freely & Hanzelka as cited by Christie, 2012). Community partners can strategically support the facilitation of a needs assessment as recommended in Strategic Approach 1.

Recommendation: The project development team will work to identify and secure partnerships needed to promote awareness, credibility, and demand while establishing expectations of impacts, approaches, and outcomes (McCauley, 2009).

Strategic Approach 3: Establish Measures of Success – Create a data-driven environment

As previously noted, the associated study lacked the availability of data to provide a comprehensive understanding of the program's successes and failures. The design of student development initiatives should formally align with standards of learning, evaluated using a pre-defined rubric, consist of interactive learning modules that focus on career specific topics, academic preparation, effective methods for communication, and incorporate academic advising and mentoring. In addition to promoting academic relevance, the program goals should consider promoting the development of culturally competent, resilient, academically proficient and self-confident individuals, and provide opportunities for reflection.

As discussed within the Strategic Approach 1, established goals, objectives, and benchmarks guide expectations of programmatic impact. To establish effective goals for a student development program, first ask, "What should a student gain because of his/her experience of the program and its services?". The answer(s) to this basic question will serve as the foundation for what to expect as a result of the students' participation. Per the website, www.topachievement.com (n.d.), the expected outcomes, or program goals, should be thought out and written as specific, measurable, attainable, realistic, and timely statements (retrieved from http://topachievement.com/ smart.html).

The key to goal specificity lies in composing a statement that is well-defined and precise in its intention. A goal that clearly defines 1) *who* is targeted, 2) *what* is to be accomplished, 3) *where*, 4) *when*, and 5) *why* the program will occur. A clearly defined goal is easier to achieve than one that is ambiguous or vague. For example, a general goal might read, "*The program will target students interested in health careers*". A similar goal with more specificity might read, "*The program will target students, grades 9th – 12th, to participate in monthly, career exploration workshops at the neighborhood community center*". Specificity helps to ensure that all participants and stakeholders are aware of the intentions and direction of the program (retrieved from http://topachievement.com/smart.html).

An effective goal includes tangible criteria of measurement that quantifies the achievement of the desired outcomes. "*How"* is the quantifier of measurability. Determining *how* many or *how* much, for example, will assist in determining *how* you will know if you've achieved your goal. Developed objectives should outline how to achieve goals and objectives that are realistic and attainable (retrieved from http://topachievement.com/smart.html).

Realistic and attainable goals and objectives are easiest to measure. Regardless of the magnitude or ambitiousness of an established goal or objective, having the desire and the capacity to work towards its achievement makes it realistic. Constructing a timeline for the completion of a logical, step-by-step plan of action will help you to grow and develop as needed to realize the goals that you prioritize as realistic. Prioritizing goals and objectives that are most important offers the strongest motivation to achieve the

defined measures. It is important to substantiate objectives and measurements within a timeframe. Establish a start and end time for implementation and measurement to occur (retrieved from http://topachievement.com/smart.html). Finally, allow the basic philosophy, principles, and ideals of the organization to anchor the objectives and measurement processes within its mission and vision.

Recommendation: Collaborate to establish goals, objectives, and benchmarks to form expectations of programmatic impact. Throughout the goal development process, the development team is responsible for matching the mission of the organization with the objectives of the program.

Strategic Approach 4: Development and Delivery – Develop culturally competent, resilient, academically proficient, and self-confident individuals.

The program content should be current and relevant based on the findings of the needs assessment (as referenced in the Strategic Approach 1 section), and critically reflect the established goals. The effective creation and sustainability of operative learning environments is an effective goal of student development (Schlechty, 2011).

The current educational system imposes the delivery of academic instruction in response to the demands of standardized testing. Declining achievements and graduation rates suggest the ineffectiveness of this methodology (van Roekel, 2008). ELOs should focus on developing content that incorporates relevant applications, as recommended by Sizer (2004), to complement classroom instruction while also cultivating the skills of reasoning, communication, problem solving, and collaboration. Infusing relevance, or a realistic application of skill and concept, into programming promotes an environment of

learning. Understanding the application of true to life application of academic concepts encourages student engagement.

Programs that target underrepresented and marginalized populations often face additional challenges while attempting to address a variety of social barriers to achievement (Condoli & Pelavin Associates, 1992). Program designs should seek to employ diverse content delivery methods, including emerging technology platforms, to address a variety of barriers to participation (i.e. time and transportation) while meeting the virtual-interaction interests of today's youth.

Curriculum and instruction administrator, Ingrid Anderson cites the use of teaching strategies such as collaborative pairs; assessment prompts, distributed practice and summarizing strategies that hold all students accountable for learning to improve student engagement (personal communication, 2013). Instruction (hear), discussion (say), and application (do) are components of information retention. Ewell (1997) acknowledges informal learning, direct experience and reflection among the eight learning components. Teaching and providing opportunity for participants to learn creatively offers a foundation for understanding.

An assumption driven by the findings of the associated study's data analyses suggests that the availability of program content should be diverse in quantity and type to meet the diverse needs of the participants. Ensuring a strong connection between instruction, assessment, and data are in place, and sustaining are the responsibility of the curriculum developer (Love, 2009). Strategies to cultivate such relationships depend upon developing a data-friendly environment. The curriculum developer needs to

establish a plan that provides guidance based upon a strongly detailed, research-based vision (Love, 2009). However, program delivery should be flexible enough to allow for the deletion, addition, and extension of instructional content, skills practice, and enrichment activities based upon the needs and interests of the participants (Wiles & Bondi, 2011).

Creating opportunities to cultivate strong parent-student relationships may strategically support student achievement to decrease achievement gaps. Designing and incorporating a parental involvement program that equips parents with information and resources to assist their student in establishing goals, supporting the achievement of those goals by blending encouragement and oversight, understanding the ingredients for success at achieving a career goal, and financial issues associated with education and training. The program may occur using technology and face-to-face delivery of a series of 50-minute, interactive seminars. Offering student and/or parent incentives for participation in the form of extra credit, family night type environments, etc. may help to promote participation. Live offerings facilitated in the community and at school facilities extend ownership to parents and other networks of support.

Recommendation: Throughout the development and delivery process, the team should oversee the development and implementation of a program design that 1) accounts for the attitudes, interests, and cultural aspects of the audience, 2) creates an environment that is welcoming and comfortable for the participant, and 3) seeks to ensure the strategic use of resources, and build internal and external support for the program design and delivery

Strategic Approach 5: Evaluation & Review – Define and identify data-driven successes

The current socio-political climate demands fiscal accountability at every level. Funders are demanding measures and outcomes that more effectively justify financial investments. Well-intentioned thoughts and ideas are no longer sufficient. Effective mission statements communicate a measurable commitment that when implemented guide systems towards success (Holcomb, 2004). The collection, analysis, and reporting of data provide measurements of accountability as documentation of success. The purpose for data collection and analysis is essential to progressive improvements for student achievement within educational systems and settings (Depka, 2006).

An evaluation plan should clearly define the steps needed to assess programmatic processes. Program assessment is pointless if it is not educative. Assessing the effectiveness of educational programs is essential to strengthening the potential for participant growth and success. Timely data collection and analysis can help to inform research meetings and plan activation. Frequent data collection and reflective analysis will support an implementation of changes that need to occur during and throughout implementation. The triangulation of both quantitative and qualitative data can validate emerging themes. Goal achievements documented within the data demonstrates alignment. Rhetoric, or persuasive discourse often drive the development of organizational mission statements based upon the thoughts, experiences, and situations of other (adopted theory). Whereas reality roots the collection and analysis of data (theory in

use). Gaps identified between rhetoric and reality can help to define concerns, and define if and how to address them (Holcomb, 2004).

Data provides the proof of participant achievement and growth. Data analyses, when done effectively, guides decision-making processes for program development, policies, and instructional practice (Love, 2009). Systematic processes empower the program, its administrators and facilitators to better meet the needs of participants by outlining what data to collect and its uses (Hamilton et al, 2009). Various program assessments can guide decision-making. Three such examples are instructional observation, testing, and feedback. Determining both the real and perceived value of the program will support the improved quality and delivery of programmatic services as a viable extended learning opportunity.

Instructional observation is a beneficial strategy for the assessment of program content, practice, and climate. Improved student perception and team atmospheres can result from the effective use of this process (Protheroe, 2009). The role of the educational leader also occurs (Protheroe, 2009). A strong, collaborative atmosphere fosters a data driven culture (Hamilton, et all, 2009). Observational data can prompt discussions between program administrators and facilitators (Skretta as cited by Protheroe, 2009). Whether administered formally or informally, instructional observations should (1) establishing a focus of the observation using baseline data, (2) conducting an observation, and (3) follow-up reflection (Protheroe, 2009). The process should be deliberate in its approach for the assessment of established goals and benchmarks.

Measuring the alignment of program content with established standards for instruction and delivery helps to make the connection to student growth (Love, 2004). Instructional assessment offers an approach to measuring achievement levels related to learning and instruction. Knowledge and skills assessments provide interim feedback on the abilities, needs, and knowledge of participants (Wolf, 2007). Parents, teachers, and students can use analyses of data to aid with identifying needed interventions for student motivation and learning (Wolf, 2007). Educators can identify gaps in learning due to program instruction and content to help identify learning problems (Holcomb, 2004).

Assessing the quality of participant learning and engagement that occurs supports a more comprehensive analysis of program value. Feedback is the information that details the participant's reflection of his or her performance in relation to the designed intention of the instruction. Collecting participant feedback can provide the data needed for this level of evaluation, when done appropriately. Including a process to collect feedback in the overall design of the data collection plan allows for frequent analysis within an effective performance system.

Establishing a content development cycle is essential to the progression of an effectual program. A participatory process that engages all stakeholders of the learning process provides a structural plan and foundational guide for impactful learning Wiles, 2009). Comprehensive planning systematically considers all aspects of content design and growth (Wiles, 2009).

Productivity depends on having a strong capacity for developing a cycle for instructional and delivery improvements that incorporate diverse data types and assessment

methodologies, assessment calendars, and data analysis processes. Overseeing a clearly defined data collection and analyses is necessary to guide instructional enhancements, that continuous improvement within the data process occurs, and improve overall program outcomes. Recommendation: Implement a 5-step cycle (adapted from http://www.socialresearchmethods.net/kb/pecycle.php) of assessment for the continuous growth and development in the areas of instruction and delivery of content. Complete each step within both the planning and evaluation phases of the program.

Step 1: *Formulate* the goals, objectives and measures in response to the questions and hypotheses established in the planning stage.

Step 2: *Conceptualize* the available standards of measurement of outcomes in relation to the program, participants, delivery, and setting.

Step 3: *Coordinate* the collection of data to align with the program design, and adequately respond to the questions and hypotheses.

Step 4: *Analyze* the data for outcomes that define successes, gaps, and areas for revision.

Step 5: *Utilize* findings to guide management and decision-making.

Recommendation: Implement a regularly occurring cycle of assessment, review, and revision that extends no longer than 12 months per cycle.

Strategic Approach 6: Articulate Outcomes – Communicate data findings

Communicating why and how the program matters should occur through systematic reporting. Reporting involves organizing the analysis of data as summaries of information regarding program outcomes, and demonstrates that the program made a difference. Reports should be concise and clearly defined to current and potential partners

with an ability to extract and act upon meaningful perceptions. Formally sharing the evaluative program conclusions of longitudinal student development programming contributes to the availability of literature and empirical evidence for a broad application of defined knowledge within a variety of settings. The addition of data to guide the development or refinement of longitudinal ELO programs will promote efficacy among said programs. Effective reporting can help to lay the foundation to garner future resource.

Sharing program outcomes in a variety of platforms increases the potential of public awareness of the program and its level of efficacy. The selected platform should drive the format of the report. Traditional formats include:

Annual fiscal reports primarily target funders and partners. The inclusion of narratives and testimonials often complement statistical analytics to provide a comprehensive summary of impact and outcome. The overarching intention of this format is to maintain existing partnerships and funding streams. Annual fiscal data reporting often occurs using both print and electronic formats.

Dashboards generally present statistical data in an electronic format. Static, archived data becomes accessible to individuals interested in examining program outcomes driven by basic data points such as age, race, gender, and other demographics. Dashboards are regularly accessible through organizational web pages.

Alerts commonly activate stakeholders to address internal or external threats against the achievement of established outcomes. Alerts generally disseminate data via email, social platforms, and other electronic platforms (retrieved from

https://blogs.adobe.com/ digitalmarketing/analytics/reporting-vs-analysis-whats-the-difference/).

Newsletters deliver regularly scheduled periodic updates of short-term program accomplishments, spotlight scheduled opportunities for engagement by current and future stakeholders, and market participation of existing and potential participants.

Generalizing the findings of research supports the synthesis of data and helps to establish foundations for future research (retrieved from https://blogs.adobe.com/ digitalmarketing/analytics/reporting-vs-analysis-whats-the-difference/). As previously stated, program assessments should inform and educate for the benefit of the assessed program, and to improve the broader programmatic genre.

Recommendation: Share program successes and best practices through frequent and consistent reporting processes.

Strategic Approach 7: Assess, Review & Revise

Assessment and review extends beyond determining student and program outcomes. While data collection and analyses convey "*if"* benchmarks are achieved, data reports can also provide a deeper understanding of "*how"* and "*why"* achievement occurs. If the program seeks to increase the number of underrepresented minority students choosing to enter the health professions pipeline, effective data collection and analysis processes will demonstrate, over time, how many students succeed in reaching that goal. A deeper analysis of data, however, should also explain the process for achievement of the measure. An in-depth review of analysis outcomes contributes a level

of understanding that will guide the refinement of program content, delivery, and outcome.

Incorporating a review cycle within each stage of program development, implementation, and evaluation ensures that alignment occurs and validates program efficacy. Review for the quality, effectiveness, and impacts of content, administration, facilitation, assessment tools and processes supports an infrastructure for revision and improvement. Anticipate less than perfect data outcomes, and avoid discouragement. A thorough review cycle may reveal overlooked insights towards enhancement and revision. These insights can offer valuable contributions to the availability of empirical data that enact social change.

Within each stage of program planning, development, implementation, and evaluation, revision should always remain an option. However, data should strongly guide decisions regarding program. Study the data for the emergence of correlations. Recommendation: Consider participant and parental views, facilitator observations, and participant achievement as vital components of the revision process. Recommendation: Culminate each review cycle with a sharing of results, and the implementation of revisions as driven by the results with stakeholders. Following reporting, repeat the assessment and review cycle.

The following evaluation table includes common steps related to project evaluation. Includes are four columns for evaluation of the project as aligned with the presented recommendations: strategy approach, individual responsible for strategy implementation, recommended timeline for implementation, and the evaluation measure.

Project Evaluation Table

Strategic Approach	*Recommendation*	*Responsible Individual / Group*	*Evaluation Measure*	*Timeline*
	Define the Issue	*Project Manager*		
Planning & Analysis	*Convene Development Team*	*Project Manager*	*Checklist*	*60 Days*
	Needs Assessment	*Development Team*	*Checklist*	*60 Days*
Collaborate	*Secure Partnerships*	*Development Team*	*Checklist*	*On Going*
Measures of Success	*Establish Goals, Objectives, & Measures*	*Development Team*	*Mixed-Methods Data Collection*	*30 Days*
Development & Delivery	*Program Design*	*Curriculum Designer Program Facilitators*	*Mixed-Methods Data Collection*	*6 months*
Evaluation & Review	*Evaluation Cycle*	*Development Team*	*Outcome Analysis*	*Annual*
Reporting	*Articulate Outcomes*	*Development Team*	*Checklist*	*Continuous*
Assess, Review, Revise	*Review of Processes*	*Development Team Program Facilitators Program Stakeholders*	*Mixed-Data Collection*	*Continuous*

Conclusion

The purpose, collection, analysis, and reporting of data drives the application of research. A program's reliability and credibility validates its contribution to the achievement of underrepresented minority students through cyclical assessment, review, and revision.

The results of the associated study supported by available literature provided a substantiated basis for this white paper. Presented for consideration are seven strategic approaches and respective recommendations for diverse implementation. The intention is to contribute towards establishing a foundation for research that is effective and efficient, and promotes behavioral and social improvements.

In summary, the sustainability of a student development program is strongly dependent upon a continuous cycle of data collection and analysis. Although these

processes may seem daunting, programs should embrace the lessons for a more effective use of data.

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Appendix B: Project Assessment Survey

Assessment Factor	Survey Question
Proximity	Q1. With which AHEC are you associated? _____ Q2. What is your role in student programming? a. Executive Director b. Program Director c. Center Director d. Program Coordinator e. Other _____

Instructions: Using the provided scale, rate the following statements of the presentation based on the content of the presentation

		Strongly Agree 5	Agree 4	Disagree 3	Strongly Disagree 2	Neutral 1
Authority	Q3. The authority of this presentation was clear					
	Q4. The authority of this presentation was credible					
	Q5. The authority of this presentation was supported by data and literature					
Quality	Q5. The information was complete					
	Q6. The information was appropriate					
	Q7. The information was organized					
Relevance	Q8. The information expands the availability of material within the field					
	Q9. The information was timely in relation to workforce issues					
	Q10. The information offers predictive usage					

Utility	Q11. What did you find most valuable about the information presented?
	Q12. How can this information be applied within your organization and / or program?
	Q13. What questions do you have following the presentation?

Appendix C: Composite Longitudinal Enrollment Figures and Tables

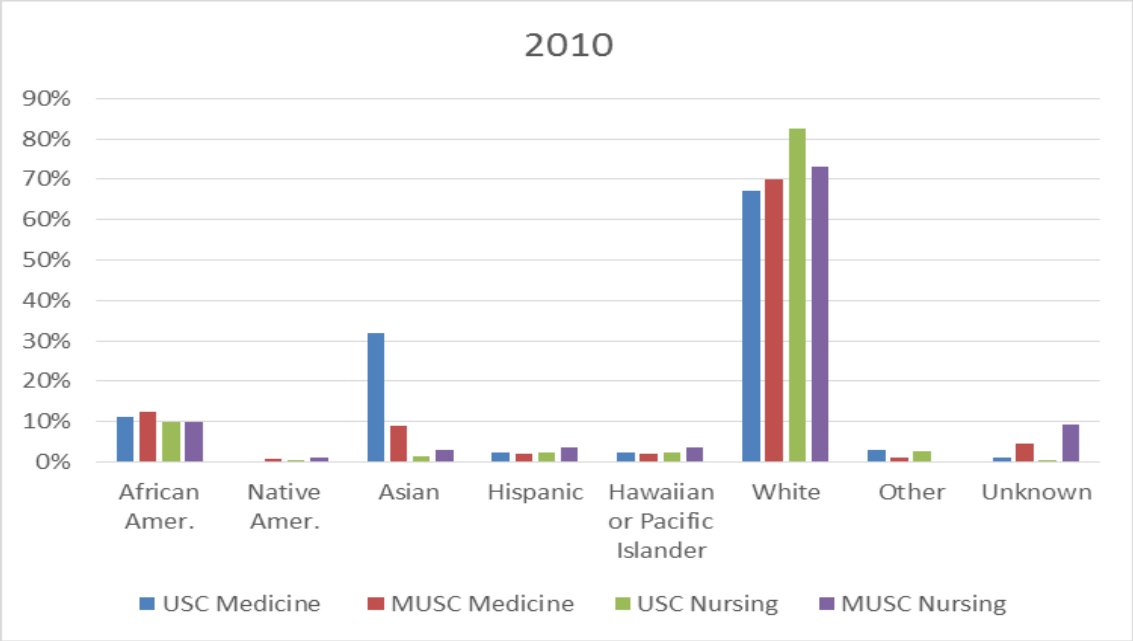


Figure C1. Fiscal Year 2010 Enrollments.

Table C8

Composite Longitudinal Health Professions School Enrollment

	African Amer.	Native Amer.	Asian	Hispanic	Hawaiian / Pacific Islander	White	Other	Unknown	Total
USC Medicine	23	0	66	5	1	139	6	2	207
MUSC Medicine	87	6	63	15	NR	488	7	31	697
USC Nursing	122	7	17	29	1	1004	32	2	1218
MUSC Nursing	37	4	11	13	NR	274	0	35	374

NR – Not Reported
Table C8

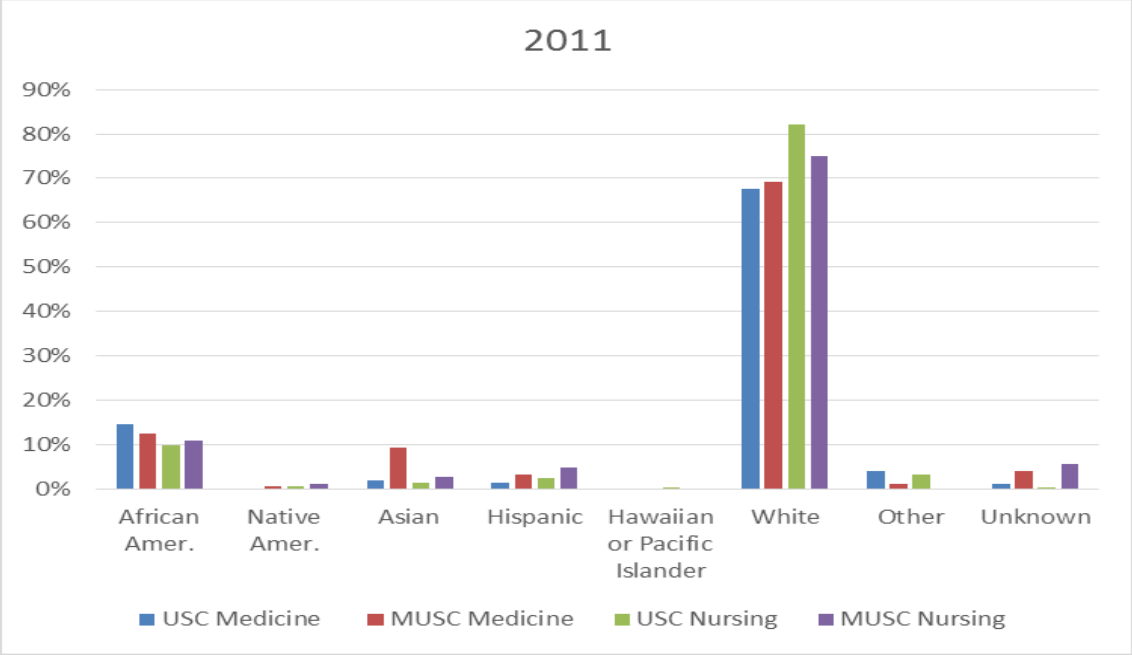


Figure C2. Fiscal Year 2011 Enrollments

Table C9

Fiscal Year 2011 Enrollments

	African Amer.	Native Amer.	Asian	Hispanic	Hawaiian or Pacific Islander	White	Other	Unknown	Total
USC Medicine	30	0	4	3	0	140	8	2	207
MUSC Medicine	87	4	65	22	NR	481	8	28	695
USC Nursing	124	8	16	32	5	1042	39	1	1268
MUSC Nursing	45	4	11	20	NR	307	0	23	410

Table C9

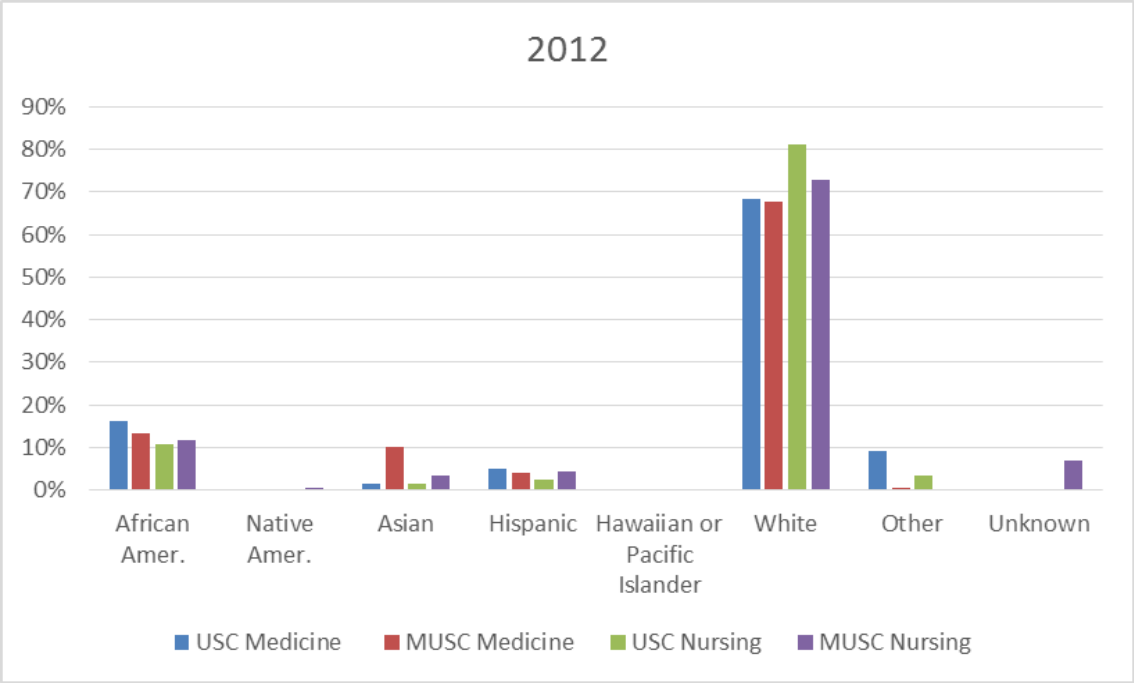


Figure C3. Fiscal Year 2012 Enrollments

Table C10

Fiscal Year 2012 Enrollments

	African Amer.	Native Amer.	Asian	Hispanic	Hawaiian or Pacific Islander	White	Other	Unknown	TOTAL
USC Medicine	33	0	3	10	0	140	19	0	205
MUSC Medicine	94	2	72	29	NR	478	4	27	706
USC Nursing	146	5	22	33	3	1101	48	2	1358
MUSC Nursing	52	3	15	19	NR	319	0	31	439

NR - Not Reported

Table C10

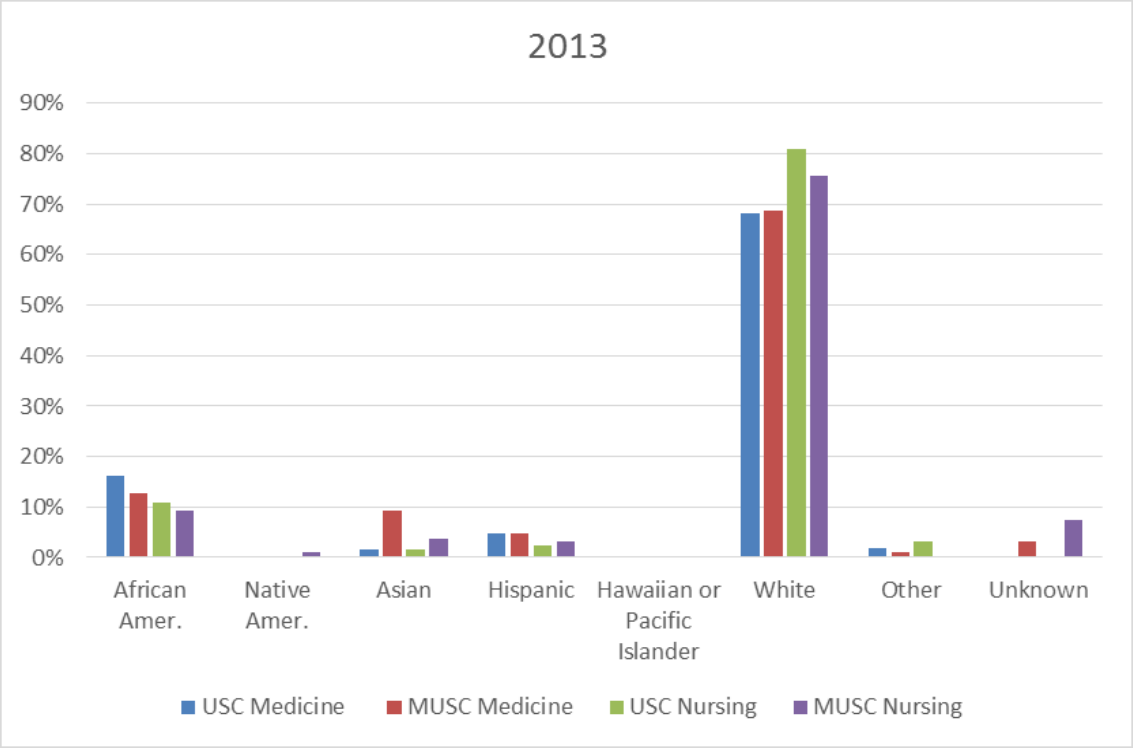


Figure C4. Fiscal Year 2013 Enrollments

Table C11

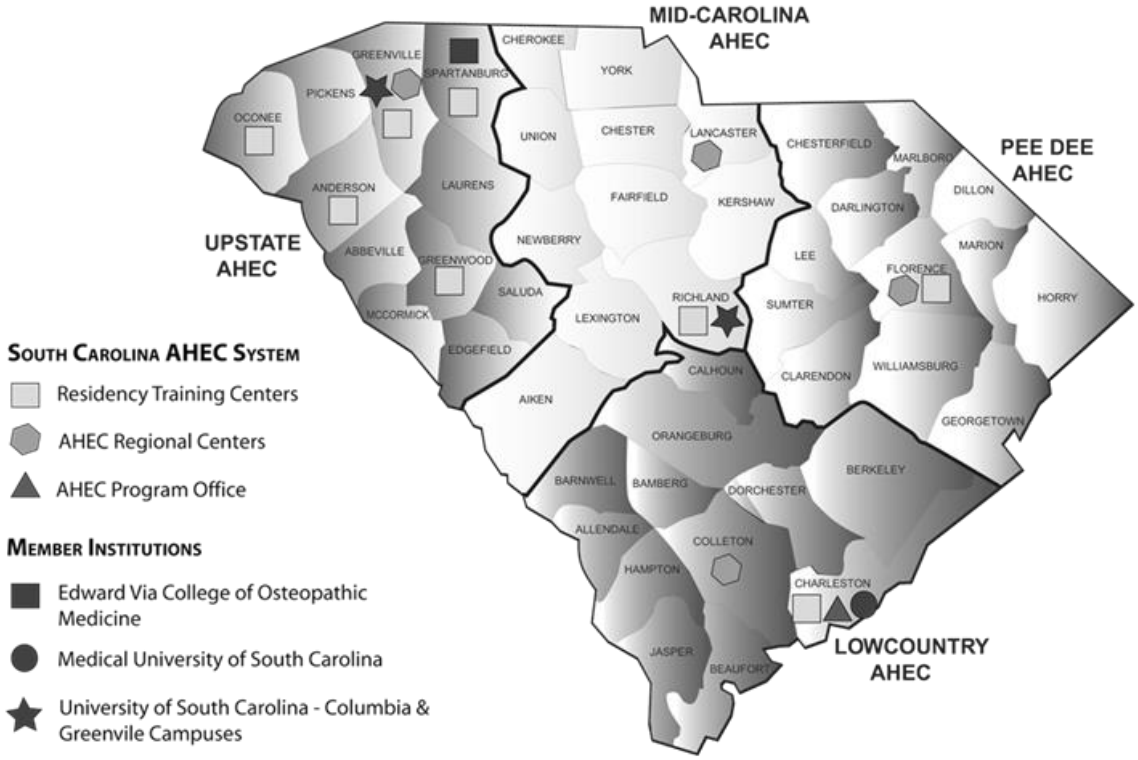
Fiscal Year 2013 Enrollments

	African Amer.	Native Amer.	Asian	Hispanic	Hawaiian or Pacific Islander	White	Other	Unknown	TOTAL
USC Medicine	33	0	3	10	0	140	4	0	205
MUSC Medicine	91	2	67	35	NR	495	7	22	719
USC Nursing	146	5	22	33	3	1101	44	2	1358
MUSC Nursing	42	5	17	14	NR	346	0	34	458

NR – Not Reported
Table C11

(Retrieved from http://academicdepartments.musc.edu/esl/em/reports/long_reports/long_univ.html and http://ipr.sc.edu/enrollment/)

Appendix D: Map of the South Carolina AHEC System



Graphic 1

(Published with the permission of South Carolina AHEC)

Appendix E: Permission for Use of South Carolina AHEC Data and Regional Map

MEMO

March 10, 2015

TO: Deborah Carson, Pharm D
Associate Program Director of Education
South Carolina AHEC

FR: Angelica Christie, MEd

RE: Request for the Use of HCP Data and Graphic

I am seeking to conduct a project study that addresses the need to empirically examine the extent and manner in which Health Careers Academy (HCA) is meeting its intended purpose of fostering the successful matriculation of underrepresented minority (URM) students through healthcare degree programs and into the healthcare professions. As a requirement of doctoral study, I am proposing to conduct a quantitative trend analysis of archived HCA program data and current matriculation data to assess the extent and manner in which matriculation status is statistically associated with the extent and type of HCA program participation.

Towards this end, I would like to request a report that queries HCA participation data of (a) students who participated in HCA activity between August 2006 and May 2010, and (b) who were enrolled in grades 9^{th} – 10^{th}. I request that the report provides unidentifiable data for each participant that includes race, gender, region for HCA participation, the high school of enrollment, HCA module and activity enrollment transcript, and degree completion information.

The permission of South Carolina AHEC is sought to include the results of this empirical analysis to provide needed insights to promote the sustainability of the HCA program and to guide and support program improvement efforts. This project study will culminate in a position paper that will present the results of this analysis and further detail the manner in which identified shortcomings in the HCA program curriculum will be addressed to ensure the success of the program.

I also request the permission of South Carolina AHEC to include the AHEC regional map graphic as a part of the proposal and subsequent position paper.

Permission approved: Date: 3/24/2015

Deborah Stier Carson, PharmD
Associate Program Director for Education
South Carolina Area Health Education Consortium