Generating a BIPOC Student Pipeline into Minnesota Nursing

Exploring the Influence of Socioformative Career Decision Factors

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Part I: Organizational Context

Background

Nurses in the United States are a key driver in successful healthcare delivery in nearly every health services delivery context. However, the nursing profession in the United States and globally has faced a shortage of qualified, licensed workers for most of the last century. Licensed practical nurses (LPNs), Registered Nurses (RNs) and Certified Nursing Assistants (CNAs) experience increasingly taxing and dangerous working environments due to understaffing and overwork, and the Covid-19 pandemic exacerbated the shortage through both nursing mortality and an exit from the profession (Udod, 2023). The state of Minnesota is no different with recent projections indicating a need to increase nursing graduates by 200% to 300% to address the historical and growing gap between nursing staff and demand (CNEE Powerpoint presentation, personal communication, April 30, 2023). There is a clear and urgent need to develop a pipeline of nurses through expanded enrollments, and one potential area to fuel this growth is within the BIPOC community in the state.

This capstone project, through partnership with Center for Nursing Equity and Excellence (CNEE) in Minnesota, focuses on the impact of socioformative career decision factors, including the accuracy and inclusivity of nursing-specific high school guidance resources, as well as the availability and quality of nursing professional mentorship, on BIPOC student perceptions and choice of nursing career pathways within the state of Minnesota.

Center for Nursing Equity & Excellence (CNEE)

The Center for Nursing Equity and Excellence (CNEE) is a higher education coalition formed in November 2022 through a partnership between the University of Minnesota and the thirty-three higher education institutions that comprise the Minnesota State University system. These institutions created CNEE to seek and implement innovative measures within Minnesota to address critical shortages of nursing providers. The organization pursues its vision and goals through the employment of six subcommittees under the guidance of the CNEE Executive Director, the CNEE advisory and steering committees and CNEE staff. Each subcommittee is focused on, and responsible for, one of six strategic objectives.

CNEE Strategic Priorities and Subcommittees

Within the Pipeline pillar, the committee focuses on creating a sustainable and expanding pipeline of potential future nurses through engagement with K-12 schools and development of specific nursing pathway programs. The Equity, Diversity and Inclusion committee works to enhance EDI in nursing education and the nursing workforce, as well as to drive equitable health outcomes for all Minnesotans. The Education pillar work seeks to reimagine nursing education through clinical-academic partnerships, innovative education strategies and the removal of financial and other barriers to education.

One aspect of reimagining nursing education is leveraging advanced technology and equipment to support simulation-based education, which is the charter of the Simulation subcommittee. The final two pillars focus on the wellbeing and flourishing of both nursing students and the nursing workforce, as well as retention of current nurses. Figure 1 below illustrates the

CNEE organizational structure and ecosystem, including the six subcommittees that steer the work of the Center.
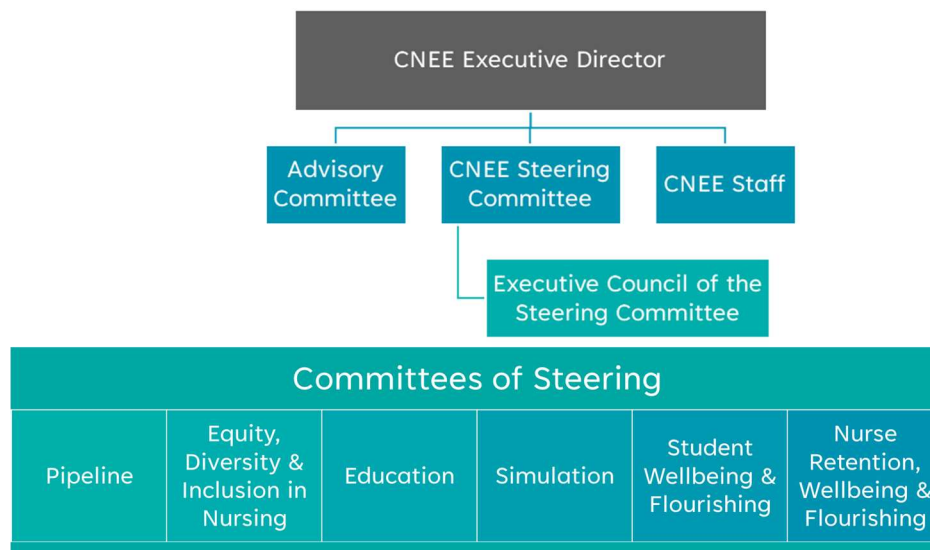
Figure 1: CNEE Organizational Structure and Ecosystem

CNEE Stakeholder Engagement

Three primary internal stakeholders founded the CNEE coalition – Dr. Connie White Delaney, Dean of the School of Nursing, University of Minnesota; Valerie DeFor, Executive Director, The Minnesota State HealthForce Center of Excellence; and Dr. Jennifer Eccles, Executive Director of CNEE.

Having been established in November 2022, CNEE is still nascent in its evolution toward addressing key issues in the education of, and practice in, nursing in Minnesota. The Center is actively pursuing funding from Federal and State grants and budgetary allocations, as well as from nursing industry foundations, but substantial outside funding has not yet been attained. As such, the organization is still working to make more sufficient progress in each of its six strategic priorities. However, CNEE's primary stakeholders for this improvement project come from organizations

and a position of substantial standing and influence within Minnesota, including the University of Minnesota College of Nursing and Minnesota State University. As the Center continues to seek funding sources, it is establishing the organizational infrastructure and (beginning in September 2023) started identifying and onboarding the subcommittee leaders for each of the six strategic pillars.

That said, the stakeholders for this improvement project are extensive. CNEE is connected and incorporates the voice of virtually all nursing-related educational and professional organizations in the state. Figure 2 includes the organizations that are currently connected to CNEE. The stakeholder group that likely has the most to gain from a successful project are BIPOC communities in Minnesota, both for high school students and their ability to reach and persist in nursing occupations and the broader public through more favorable health outcomes and diminished health disparities.

Stakeholders Connected to Coalition

Minnesota Center for Nursing	Care Providers of Minnesota	LeadingAge Minnesota	Minnesota Hospital Association	Health Education and Industry Partnership Council	Minnesota Board of Nursing
Minnesota Department of Health	Minnesota HOSA - Future Health Professionals	Minnesota Simulation for Healthcare Education Partnerships (MnSHEP)	Minnesota State HealthForce Center of Excellence	The Clinical Coordination Partnership (TCCP)	Essentia Health
M Health Fairview	Mayo Clinic Health System	BlueCross BlueShield of Minnesota	Tribal Colleges	Nigerian Nurses Association	Office of Diversity, Equity and Inclusion at Minnesota State
	Office of Equity, Diversity and Inclusion at the University of Minnesota	Minnesota Association of Colleges of Nursing	Associate Degree – Practical Nursing Directors of Nursing	Department of Employment and Economic Development	Minnesota Office of Higher Education

Figure 2: CNEE Influential Stakeholder Organizations

From its founding, CNEE's primary focus of engagement has been outreach with education providers and nursing workforce and healthcare providers within the state. These groups have representation within CNEE's officers and executive council. In addition, CNEE representatives meet as often as practical with representatives from Minnesota higher education providers, Minnesota's Health Occupation Students of America (HOSA) leadership, healthcare providers such as Mayo Clinic and Essentia Health, health insurers like Blue Cross/Blue Shield of Minnesota and other non-profit organizations. Each category of stakeholder has a vested interest in the proliferation of nurses in Minnesota, but each stakeholder may have differing interests in solving the problem. The purpose of these regular meetings is to generate innovative ideas that can be supported by CNEE and implemented within the state to improve access, success and longevity of nurses throughout the state.

These stakeholder discussions impact each of CNEE's strategic priorities. Working with HOSA and the postsecondary nursing education providers, CNEE is influencing the pipeline of nursing students, creating more innovative and engaging nursing education strategies, working toward a more diverse and inclusive nursing workforce, and creating more stability and support for nursing student wellbeing, which will translate to success and persistence in nursing education. Through connecting with healthcare providers, nursing education providers and other non-profit organizations, CNEE is helping to increase access to simulation training resources and protect the wellbeing of nurses and focus on nurse retention within the workforce.

Perhaps CNEE's most significant opportunity for stakeholder engagement is the transfer to CNEE of Minnesota's official representation among the National Forum of State Nursing Workforce Centers in November 2023 (Rudolph, 2023). Now one of forty-two state-level workforce centers within the forum, CNEE can meet with nursing leaders in other states to review strategies and fine-tune those successful strategies for Minnesota. State workforce centers can also co-develop legislative agendas and strategies to drive funding for state nursing solutions, as well as support legislation for positive outcomes for both nurses and patients.

With limited current funding, CNEE must determine optimal resource allocation across six ambitious strategic objectives, and the results of this improvement project may inform near-term organizational activities that contribute to progress on the pipeline, EDI and education strategic pillars.

Part II: Problem of Practice

The Broader Social Healthcare Crisis

CNEE's very reason for existence is to work toward alleviating the broad and far-reaching crisis of healthcare availability. Minnesota, like other states, needs to address severe and growing gaps between nursing supply and patient demand for nursing services, forcing organizations like CNEE to seek innovative solutions to create pipelines of nursing staff to address the need. Ongoing shortages have created a self-perpetuating and increasing gap with insufficient nursing program enrollments, insufficient LPNs and RNs, fewer students persisting to advanced nursing degrees and nursing science, and insufficient nursing faculty to expand programs. Figure 3 illustrates this interrelationship between shortage areas (CNEE Powerpoint, personal communication, April 30, 2023).
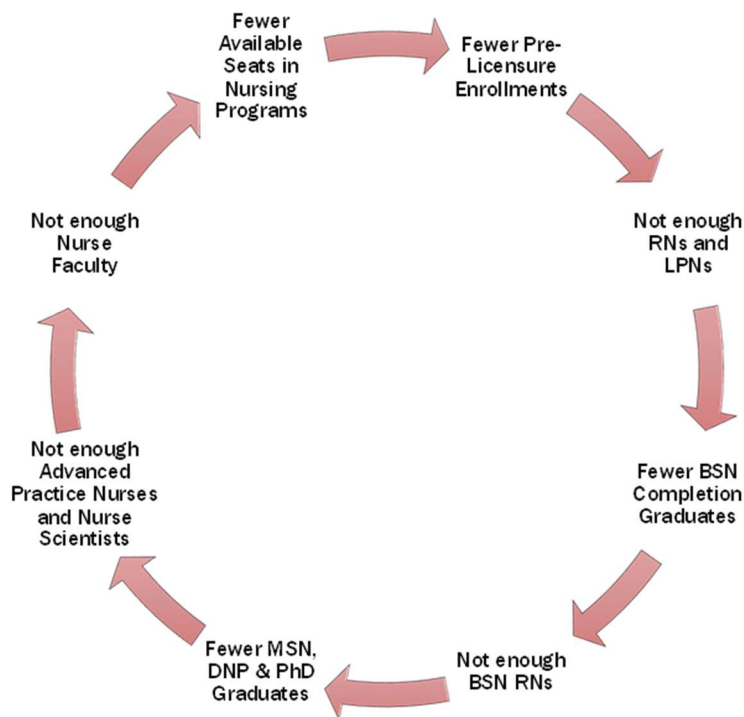
Figure 3: Cycle of Insufficiency in Minnesota Nursing

To address every possible root cause of the national nursing shortage, or even the deficit within Minnesota, would be well beyond the scope of this improvement project. Instead, the scope of this project will focus on pre-licensure nursing program enrollment as opposed to current workforce retention, advanced program persistence, or nursing faculty expansion.

Creating more robust pipelines to the nursing profession must start with filling every available seat in existing nursing programs.

Expanding Nursing Participation through Diversity and Equity

While Minnesota's nursing workforce is becoming more diverse (Minnesota Board of Nursing, 2023), non-Hispanic Whites continue to make up the majority of the nursing workforce, with percentages of minority group representation by occupation ranging from near 0% (nurse anesthetists) to 42% (nursing assistants) (Bureau of Labor Statistics, 2022). Extant research on diversity in healthcare suggests that health outcomes are positively affected when caregivers are of similar race to patients, and Minnesota has some of the greatest health disparities in the United States for BIPOC populations (Minnesota Board of Nursing, 2023).

Disparities in demographic composition of the nursing workforce by occupation, which affects sustainable wages for underrepresented groups, further impairs nursing diversity in Minnesota. In every nursing occupation for which non-White groups constitute more than 15% of the overall workforce in Minnesota (LPN, Medical Assistant, Nursing Assistant, Home Health Aide and Professional Care Aid), the current median hourly wage falls at or below the family-sustaining wage of $25.00 per hour (Bureau of Labor Statistics, 2022; Minnesota Board of Nursing, 2023).

The current racial disparity within nursing occupations in Minnesota, coupled with research suggesting more positive outcomes for minority patients cared for by minority nurses, threatens health outcomes for Minnesota's minority populations. The issue will only worsen with projections that non-White racial groups will become the majority population within the next two decades. The confluence of these factors creates a logical problem of practice in researching insufficient representation of BIPOC community members within nursing education programs and subsequently in the nursing workforce.

Socioformative Career Decision Factors as a Finite Area of Inquiry

Even focusing on pre-licensure enrollments within nursing education programs is too broad for the scope of this improvement project. Through Ishikawa analysis, I identified four potential causal drivers for the underrepresentation of BIPOC groups within nursing, two of which relate to current workforce attrition and two of which focus on pre-licensure program enrollment.

Potential causes from attrition of current nursing staff included equity attrition (limitation on advancement, pay inequities and a lack of affinity groups and support) and environmental attrition (health concerns and struggles with work/life balance). While these causes primarily center around the lived experience of BIPOC nurses already in the workforce and why they may choose to leave, these attrition factors may also be relevant to the decision-making process for BIPOC high school students researching potential career paths and whether they consider nursing in the first place.

Pre-licensure enrollment factors fell into themes of individual readiness and what I call "socioformative career decision factors," defined as socially-constructed experiences and discourses that may influence an individual's perception or pursuit of specific education and career pathways, and focused within this project on potentially misleading or racially problematic high school nursing career materials and the availability or scarcity of professional nursing role models and/or career mentors with similar ethnic and racial backgrounds to paired mentees.

I finalized the scope of inquiry within this improvement project to include the effects of socioformative career decision factors discussed above on Minnesota BIPOC student consideration and pursuit of nursing education and career. This area of inquiry is consistent with the focus on pre-licensure nursing enrollment and spans CNEE's strategic pillars of pipeline, EDI and Education.

Part III: Review of Literature

Drawing on extant literature, several prior theories form the foundation upon which the concept of socioformative career decision factors for Minnesota BIPOC students can be grounded. In addition, this prior research informs potential working hypotheses of improvement for CNEE, as well as methods through which the inquiry of this improvement project can be conducted.

Social Construction of BIPOC Student Experiences

One lens through which the lived experiences of BIPOC students in Minnesota can be explored is Social Construction theory. Berger and Luckmann (1991) posit that reality and meaning are not static and finite outside of context, but rather constructed through social interactions and agreements. In this respect, the conceptualization of nursing education and the nursing profession as a career path for BIPOC students in Minnesota is a construct of these students' social interactions and negotiation of meaning with any aspect or element of their lives that exposes them to nursing or that might influence them about nursing. In the spirit of social constructionist theory, these social influences become formative in the development not only of a constructed sense of meaning, but also of student perspectives and attitudes about nursing.

A primary lever in students' social construction of nursing as a career pathway is the counselor or counselors with whom the students interact. Literature suggests these counselors may not always have an accurate or current understanding of the profession or the requirements to achieve a career in the field (Williams & Dickstein-Fischer, 2018; Campbell-Heider et al., 2008; Woods-Giscombe et al., 2020). For example, high school counselors were found in one cross-sectional descriptive study to recognize and acknowledge the need for nurses to be caring and hard-working, but they failed to recognize or agree with the need for strong academic performance (Robbins & Hoke, 2010).

Beyond a misperception of the academic rigor required for students interested in pursuing nursing education and careers, many counselors lack an understanding of the differentiation between various roles within the broader nursing field, including antiquated ideas about the needs for Registered Nurses put forth within the Institute of Medicine's *Future of Nursing: Leading Change, Advancing Health* report, as opposed to lower level nursing roles (Williams & Dickstein-Fischer, 2018). Nursing educators and professionals are also concerned that counselors in schools lack insight into the need for nurses to provide problem-solving and leadership, as well as the broad range of work contexts available within the field (Bolan & Grainger, 2005).

Barring family or close friends with connections to nursing, counselors may be the only voice representing the nursing profession to which students have access, and so the formative influence of counselor perceptions and attitudes toward nursing is likely to diffuse to students through social interactions with counselors. Indeed, while counselors have a generally favorable view of the nursing profession (Rudel et al., 2009), misconceptions among counselors about the profession may contribute to a less favorable impression of nursing among students considering nursing as a potential career path. In a study of U.S. and Israeli high school students, students in both countries perceived nursing as not aligned with their ideal careers, even though they associated caring for others as important both in nursing and in their ideal career (Degazon et al., 2015).

Students sometimes perceive and perpetuate negative stereotypes about nursing and view nursing as a dangerous line of work (Campbell-Heider et al., 2008). Additional studies

concluded that students see nursing as having very limited autonomy (Degazon et al., 2015) and little opportunity for upward mobility (Campbell-Heider et al., 2008).

High school counselors are often also responsible for the delivery of career planning materials, such as career brochures, fact sheets and other informational documents, to high school students. Counselors may at least be curators of the schools' materials related to various career pathways, and at most may be developers of the materials. These materials may contain or be presented to students with the same misconceptions that the literature regarding direct interaction between counselors and students reflects. Career materials then become another socioformative factor in the socially constructed "reality" of nursing for high school students - a socioformative factor of focus within this improvement project.

Cultural Competence and the Social Construction of Race

While high school counselors and career materials contribute to all students' construction of the concept of a nursing profession, this social construction can be particularly impactful for BIPOC students. Sociologists starting with Boas (1931) have considered race itself to be constructed through social interaction among people and the mediation of things. This constructed nature of race and the corresponding racial interactions between BIPOC students and their teachers, administrators and counselors compound the social construction of nursing as a perceived attractive and attainable profession for these students. Implicit and even explicit biases among high school counselors may influence their identification of students whom they perceive as capable, or incapable, of succeeding in a field such as nursing. These biases may also affect the materials they develop and/or promote to students, which may further limit interest or perceived attainability of nursing among BIPOC students.

Efforts to improve the experiences of BIPOC high schoolers relative to the nursing profession, to attract them into nursing education, and to enhance the health outcomes of BIPOC patients in multiple healthcare delivery contexts require broader cultural competency among the materials schools use to present career options to students, the school staff charged with curating and disseminating those materials, and nurses in the field themselves, acting as role models or mentors to prospective and current nursing students. For this study, I will define cultural competence, based on Alidezah's and Chavan's (2016) review of thirty-two texts on cultural competence models and outcomes, as the ability to work and communicate effectively and appropriately with persons from culturally different backgrounds. Their study found that authors generally agreed upon an individual's self-awareness of ethnocentrism, biases and prejudices; their continued acquisition of new information regarding other cultures; and their cross-cultural communication and behavioral ability as the most critical components of cultural competence (Alidezah & Chavan, 2016).

The fostering of more cultural competence throughout the healthcare delivery ecosystem in Minnesota can have positive implications for all stakeholders, including BIPOC students who may be interested in joining the nursing workforce, but also for BIPOC students already within Minnesota's higher education nursing programs, nurses in the field and patients receiving care. For minority patients, the availability of culturally competent care can be a key factor in improving health outcomes and reducing health disparities (Dawkins, 2021) as this competence among nurses and other health professionals ensures better understanding of culture-specific needs and attributes of patients, including how symptoms are identified and interpreted and the timing and circumstances of seeking treatment (Anderson et al., 2003).

Within higher education, cultural competence in recruitment and diversity pipeline programs can signal the type of emotional support needed by

BIPOC students entering nursing education (Dawkins, 2021). In addition, nursing faculty can also signal the importance of cultural competence to prospective and current students and broaden such competence among future nurses of all racial and ethnic backgrounds by integrating cultural competence across the curriculum, following frameworks such as the Blueprint for Integrating Cultural Competence in the Curriculum (Cuellar et al., 2008), and legitimizing cultural competence and anti-racism as essential knowledge for nursing education through end-of-program verification of adequate knowledge and skills to care for a diverse population (Iheduru-Anderson & Alexander, 2022).

While the extant literature does not specifically address cultural competence in high school career guidance materials, viewing these materials as an element of a discursive "reality" of nursing underscores the importance of nursing career materials distributed to BIPOC high school students being culturally competent. As discourse, career materials can represent one manifestation of cultural competence, or lack of such competence, which may yield other interpretations or ways of experiencing the world less legitimate in the eyes of students consuming the materials (Iverson, 2012), and the attractiveness or unattractiveness of an educational (and career) pathway may be affected if BIPOC students' identities are not represented (Hakkola, 2015). I further address the role of discourse in the next section.

Failure to account for and foster cultural competence among nurses, nursing educators and high school counselors and staff will pose negative implications for BIPOC student attraction to, and pursuit of, nursing education and career opportunities. Pervasive lack of cultural awareness and skills in collaborating with individuals and groups with diverse racial and ethnic backgrounds may create racialized institutions among health delivery systems, postsecondary nursing education providers and high schools, in which resources are distributed inequitably and BIPOC students have limited

agency (Ray, 2019), thus perpetuating access issues to nursing.

Students both at the high school level and in nursing education may also lack the encouragement and social support they need. Graham et al. (2016) found in their review of nursing and education literature that minority nursing students perceived barriers to success from discrimination, grading biases and isolation. Before BIPOC students are even able to choose nursing education, many also experience stereotyping, discrimination and bias, being subjected to messages that they aren't smart enough [for nursing] and encouraged toward vocational schools instead (Dawkins, 2016).

The Role of Discourse in Cultural Empathy and Career Inclusivity

This improvement project will look at high school career guidance materials as discourse shaping BIPOC students' perceived reality of what nursing is and whether the profession is congruent with their own abilities, skills and identities. Gee (2008) defines discourse as "stretches of language which 'hang together' so as to make sense to some community of people, such as a contribution to a conversation or a story." Further, he differentiates between what he considers 'small d discourse,' or any language in use – a designation we will use in the context of high school career guidance materials – and 'big D Discourse,' or the integration of language, actions, interactions, tools, technologies, beliefs and values to formulate a historically significant 'kind of people' (Gee, 2015).

Nursing career materials as discursive artifacts are intended for high school students, but there are numerous different kinds of people that comprise the community of high school students. Even within BIPOC students, there are numerous Discourses associated with racial and ethnic identities, socioeconomic variables, national origins and a myriad of other variables, each of which constitute different ways in which

the discourse of career materials is experienced by different Discourse communities.

Societal phenomena of power, dominance, resistance and social inequality are both represented in, and created by, discourse (Van Dijk, 1993). If discourse, even in something as seemingly innocuous as career guidance materials, is constructed in ways that are representative only of dominant cultures or world views, they become ideologically tied to "sustaining particular relations of power and domination" (Fairclough, 2013). Fairclough also notes that language can be used to "obfuscate dominant and marginalized world views." The choice of language and imagery and the presence of implicit biases within nursing career materials may unintentionally signal to BIPOC students that they are not welcome in the nursing profession or that they are incapable of successfully completing the education and requirements to enjoy a successful nursing career. This obfuscation has been found, to a degree, at the professional level within the foundational documents of the nursing profession through a critical discourse analysis of the *Code of Ethics*, *Scope and Standards of Practice*, and *Social Policy Statement* published by the American Nurses Association, in which inconsistencies in the presentation of social justice within nursing creates tension between professionalism and social, cultural and political discourses (Valderama-Wallace, 2017). In other words, BIPOC students continue to perceive nursing careers as outside their reach, the nursing workforce continues to be predominantly staffed with white nurses, and the cycle of insufficient diversity in nursing is perpetuated.

Role Modeling and Mentorship Theories

The discourse of being a BIPOC student is largely inconsistent with the discourse of being a nurse. For example, the imagery Black students often receive in relation to viable career options are glamorous, yet stereotypical, including sports figures, musical artists and acting celebrities, while the portrayal of nurses is typically white, uncaring, harsh, sexualized "handmaidens" to doctors (Dawkins, 2016). Because the nursing workforce in Minnesota underrepresents BIPOC adults, there are too few nurses to serve as role models or mentors for BIPOC high school students, who can identify with minority nurses and project images of themselves thriving in the profession.

Creating a pipeline of BIPOC students into nursing education is largely a question of *access* - making possible for these students the pursuit of an education and career in nursing. The idea of mentoring is most commonly associated with questions of *success* - supporting nursing students or nursing practitioners in their educational or career development goals. However, mentorship relationships center around three common principles: using multifaceted approaches to help individuals grow and accomplish goals; providing professional and/or career support, role modeling and psychosocial support through planned mentor/mentee activities; and engaging in personal and reciprocal interactions (Jacobi, 1991). In this respect, much of what a mentor provides for a mentee who has already matriculated to nursing education or who has already entered the workforce can also benefit BIPOC high school students who are still evaluating educational and career options as they collaborate with mentors/role models in planning, acting, reflecting and problem-solving (McGee, 2016) in pursuit of a path for their future.

One theoretical underpinning to this collaborative role model/mentorship relationship is social exchange theory. Blau (1964, 2017) argues that social exchange is the engaging of self-interested actors in relationships intended to achieve personal goals by exchanging something of value for desired resources or benefits. Thus, role model/mentorship relationships involve reciprocity in which the mentor and the mentee consider the benefits and the costs of their relationship in an assessment of the relationship's value (Cropanzano & Mitchell, 2005). Relying on minority nurses to

serve as role models and mentors to BIPOC high school students risks excessive costs such as burnout and frustration to mentors due to the limited number available, and this may result in fewer nurses being willing to enter into role model or mentorship relationships with these high schoolers.

Social network theory (Dunn, 1983) considers the manner in which social relationships transmit information, channel personal influence and empower attitudinal or behavioral change. BIPOC high school students, through the lens of social network theory, increase their ability to acquire information and empower behavioral, educational and career changes for themselves by entering into role model and mentor relationships. Because each of these relationships represents part of a social network with distinct access to informational benefits, and because social network connections in one context can affect social dynamics in other contexts, BIPOC students are better served toward upward mobility and adaptability to social situations by creating broader and more diverse social networks than by maintaining networks that are smaller and less diversified (Packard, 2003).

Social capital is intangible capital in which social relationships yield access to privileged channels of information and resources (Smith, 2007). Underrepresented students are traditionally targeted for mentorship programs because, on average, they have less access to these privileged channels of information and resources. Social capital theory addresses how those with power use social networks and connections to retain that power, and thus socially reproduce inequality (Bourdieu & Passeron, 1977). This presents a serious question in the context of white nurses potentially working with BIPOC high school students as role models or mentors to the nursing profession. If white mentors are consciously or unconsciously vested in maintaining power within their social networks, it opens the door for BIPOC mentees to be evaluated by mentors inequitably as compared

to white mentees or to have information or social capital critical to the BIPOC mentee's success withheld, especially if institutions do not have accountability in place to ensure all students have access to the necessary social capital to succeed.

One means by which role model engagement and mentorship programs can ensure that social capital is not used to perpetuate systems of inequity is through the further development of cultural competence among white nursing role models and mentors. Based on current nursing demographics, there simply aren't enough BIPOC nurses to adequately serve the needs of BIPOC high school students to fuel the type of necessary diversification in the profession. That leaves white nurses to serve as role models/mentors to Black, Indigenous, Latinx and other minority high schoolers who might consider careers in nursing. How do we ensure that these white nurses have sufficient cultural competence to effectively collaborate with BIPOC students?

In addition to the continued fostering of efforts to proliferate cultural competence in healthcare delivery sites (Dawkins, 2016; Anderson et al., 2003) and integration into postsecondary nursing education curricula (Cuellar et al., 2008; Iheduru-Anderson & Alexander, 2022), this improvement project seeks to understand the viability of novel and innovative methods to build cultural competence among currently available white nursing mentors. Drawing from the work of Leander (2023), who performed a qualitative study of a long-form improvisational comedy team, I will look to whether Leander's concept of collaborative affective attunement (CAA) could be applied to persistently assembled interracial groups of nursing staff within the context of certification continuing education or other professional development environments to organically develop greater affective attunement, and by extension cultural competence, by white nurses toward their minority counterparts.

Work with the improvisation group largely centered around the philosophy and practice of "yes-and" where actors collaborate by acknowledging the contributions of others and then building upon them (Leander et al., 2023). Within the social relationships of white role models/mentors and their BIPOC student counterparts, the adoption and adherence to a "yes-and" philosophy could contribute to a safe and trusting relationship and a move toward mentor cultural competence. Collaborative affective attunement is about a sensing or activation brought on through an energy experienced at the time of improvisation, involving an affective openness or rawness (Leander et al., 2023). In focus groups within the study, participants "associated this kind of knowing with "speaking the same language," with sharing "energy," with "tuning in," with "synergy," with "vibing" and with the "subconscious" (Leander et al., 2023). Whether this same type of attunement could potentially be leveraged in the development of mentor cultural competence is a point of exploration for this improvement project.

Prior Efforts to Build a BIPOC Nursing Pipeline

The need to draw a more diverse pipeline of students into nursing is not a new problem. Numerous efforts and strategies have been developed to draw more BIPOC students into American nursing education programs. The University of Buffalo School of Nursing engaged with guidance counselors from the Buffalo, New York Public School system to provide a workshop to discuss perceptions of nursing education and professions (Campbell-Heider, Sackett, & Whistler, 2008). The workshop, first held in 2003, provided education to counselors on the nursing profession and sought to dispel some misconceptions about nursing. The workshop also sought to identify and fast-track talented minority students into nursing pathways. While not empirically proven to be the sole driver for growth, the workshops appeared to be effective, with no minority students from Buffalo Public Schools admitted

to University of Buffalo in 2003, the first year of the workshops, but 24 students admitted in the four years that followed (Campbell-Heider, Sackett, & Whistler, 2008).

The American Association of Critical Care Nurses (AACN) partners with local schools in communities in which they conduct their National Teaching Institute and Critical Care Exposition, in which middle school students are brought to the exposition on the last day, provided information about critical care nursing, as well as door prizes, allowed to view and test equipment and administered a quiz at the end to determine learning (Samson, 2004). Some students were invited back the following year, along with a family member, and students left with "an enthusiasm for nursing and a commitment to work hard in school and to talk about nursing as a real career choice with their peers" (Samson, 2004).

Additional strategies for pipelining more diverse student populations into nursing education involved pre-entry programs, such as those with University of Buffalo and AACN detailed above (Samson, 2004; Beacham, Askew & Williams, 2009), mentoring and support systems, and financial support (Samson, 2004). In agreement with discussions above, the presence not only of mentors, but also of role models, whose stories of perseverance can inspire BIPOC students to persist into nursing pathways is important to minority recruitment strategies (Matutina, 2008). In addition, successful recruitment strategies may also include partnerships with community organizations such as schools, churches, healthcare providers and institutions of higher education (Phillips & Malone, 2014; Bianco, Leech & Mitchell, 2011); providing financial support for minority students, as well as guidance on where to find available scholarships and grants (Nnedu, 2009; Phillips & Malone, 2014; Condon et al., 2013); the implementation of evidence-based holistic admission to expand traditional admissions criteria and create a more equitable admissions process (Glazer et al., 2016); and providing students assistance in complicated application

processes (Beacham, Askew & Williams, 2009). All of these strategies were considered during data collection, data analysis and formulation of recommendations for this improvement project.

Part IV: Conceptual Framework and Project Questions

Conceptual Frame

The review of literature informs theoretical underpinnings and contextual application of an improvement project to address the representation of BIPOC students in Minnesota nursing. The framework is built upon a theoretical foundation of social constructionism and cultural competency and empathy theories. The framework represents the evaluation of key socioformative career decision factors of Minnesota BIPOC high school students, including high school career materials and role model and mentorship relationships.

Socioformative Career Decision Factor: Nursing-Specific Career Materials

In terms of nursing-specific career counseling resources, the materials must first and foremost be an accurate and current reflection of the profession. Antiquated materials will provide any student, including BIPOC students, a misrepresentation of the profession, which will not serve to entice a pipeline of new nursing enrollees. Moreover, because the dispersion of BIPOC representation within Minnesota nursing is currently pooled within the lowest-paying nursing-related occupations, materials that focus on these short-term, quick income occupations

such as CNAs or personal aides may work to perpetuate the disparity in representation across the full gambit of nursing occupations. Career materials must also be free of language and phrasing that privileges any group over another, and it must be free of stereotyping of BIPOC groups. In addition to language discourse, these materials should be visually inclusive as well, including representation of BIPOC groups in non-stereotypical contexts in nursing.

Socioformative Career Decision Factor: Culturally Competent Career Role Models and Mentors

Dobbin & Kalev (2016) indicate that mentor-mentee relationships are more effective when mentors and mentees share attributes and interests. Within this capstone project, quality available career role modeling and mentorships are defined as those that are perceived by mentees as providing productive outcomes of career knowledge, enhanced preparation for an educational and vocational career in nursing and social/emotional support along the way.

Each of these socioformative career decision factors are evaluated within the framework based on critical discourse analysis and social mentorship theories.

Discourse Theory
Critical Discourse Theory/Analysis

Social Mentorship Theories
Social Capital
Social Network
Social Exchange

Socio-Formative Barriers to BIPOC Nursing Entry

Problematic Nursing Career Materials
- Privileged/Biased
- Non-representative
- Antiquated

Few Role Models / Mentors
- Too Few BIPOC Role Models / Mentors
- Lack of Cultural Awareness/Sensitivity

Working Theory of Improvement

Standardized Inclusive Engagement
- Inclusive Career Materials
- In-School Nursing "Road Shows"

Building Inclusive Mentorship
- BIPOC Nurse Recruitment
- Collaborative Affective Attunement

Target State

Enhanced BIPOC Exposure to/Interest in Nursing

Better Academic Preparation for Nursing Pathways

Increased Enrollment in Nursing Programs

Cultural Competence / Cultural Empathy Theory

Social Construction Theory

Figure 4: Improvement Project Conceptual Framework

Within social constructionist theory, Berger and Luckmann (1991) posit that reality and meaning are not static and finite outside of context, but rather constructed through social interactions and agreements. In this respect, the conceptualization of nursing education and the nursing profession as a career path for BIPOC students in Minnesota is a construct of these students' social interactions with counselor- or school-provided materials representing nursing, with available nursing role models and mentors, and with teachers, administrators and peers. It is relevant to explore the socioformative impacts of these social interactions on the reality of the nursing profession constructed by these BIPOC high schoolers.

BIPOC high school students may also engage in these social interactions as they experience other racial and ethnic social challenges. To the degree that the school districts in which these students are enrolled, or the postsecondary institutions offering nursing education programs, may be consciously or implicitly racialized, these students may experience limitations in agency and inequitable distribution of resources (Ray, 2019). BIPOC students are also faced with disadvantages due to the evolution of Whiteness as property in the U.S. (Harris, 1993) and the ways that this property based on racial identity has marginalized minorities, particularly Blacks, in schools and in education generally (Dumas & Ross, 2016).

Regarding specific socioformative factors, the consumption of written discourse in the form of nursing-related career materials and literature may influence BIPOC student perceptions of the career, their "fit" with that career path and their ability to attain it. In his 2013 work on critical

discourse analysis, Fairclough notes that language can be used to "obfuscate dominant and marginalized world views." The choice of language and imagery and the presence of implicit biases within nursing career materials may unintentionally signal to BIPOC students that they are not welcome in the nursing profession or that they are incapable of successfully completing the education and requirements to enjoy a successful nursing career. This obfuscation has been found, to a degree, at the professional level within the foundational documents of the nursing profession through a critical discourse analysis of the *Code of Ethics*, *Scope and Standards of Practice*, and *Social Policy Statement* published by the American Nurses Association, in which inconsistencies in the presentation of social justice within nursing creates tension between professionalism and social, cultural and political discourses (Valderama-Wallace, 2017).

Mentor-mentee relationships involve the exchange of social capital, which can be used to reproduce and entrench social inequalities (Bourdieu, 1977, 1986), so BIPOC high school students in Minnesota may be better served by BIPOC mentors, or at a minimum, mentors who are committed to inclusive policies and the discontinuation of inequalities. Social network theory suggests that mentees should build a network of simultaneous mentoring/supporting relationships to maximize their development (Higgins & Kram, 2001).

The conceptual model above manifests the problem statement, working theory of improvement and desired future state of an improvement project within the context of the socioformative factors encapsulated within the primary project question. Within the problem statement addressed in the project area of inquiry, Minnesota high schools may be using antiquated nursing career materials that problematically exclude BIPOC students and signal that nursing is not a desirable or attainable career alternative for members of the BIPOC community. Further, the lack of

diversity within the nursing workforce in Minnesota suggests there is a corresponding lack of available BIPOC nursing role models and mentors who can help to build a pipeline of BIPOC nursing students through engagement with local schools.

The working theory of improvement reflected in the conceptual model provides avenues for research and exploration as to the potential efficacy of interventions to address the problem statement. Analyzing current career materials distributed to Minnesota high school students may identify common themes that problematize the presentation of nursing to BIPOC students or that inadvertently exclude BIPOC students from considering the profession. The availability of mentors with similar attributes or who are more culturally competent if not culturally like BIPOC students may be enhanced through virtualized mentorship relationships (Silverstein, et al., 2022) or the development of collaborative affective attunement through mentors participating in improvisation or simulation exercises (Leander et al., 2023).

Through effective intervention, CNEE may reach the desired state reflected in the conceptual model, including increased awareness of, and interest in, the nursing profession among a more academically prepared BIPOC student population, creating a more diverse pipeline of nursing professionals to care for Minnesotans.

Project Question

Grounded in the conceptual framework of this improvement project for CNEE, and given the definitions above for the key socioformative career decision factors of interest, the project seeks to answer the following primary project question:

PQ1: In what ways does the impact of socioformative career decision factors affect the perceptions and choice of nursing career pathways for BIPOC high school students in Minnesota?

Part VI: Project Design

Exploration and response to the primary project question was guided by the data collection table below (Table 1). In determining the ways in which the socioformative career decision factor of high school nursing career materials affects BIPOC student perceptions of nursing, it was critical to perform document analysis on the materials currently being used in Minnesota high schools relative to nursing, focusing on both accurate and current representation of the profession and on cultural competence, empathy and representation of BIPOC communities within the publications.

It was also important to collect first-hand accounts of how BIPOC students in Minnesota have experienced these career materials and how those experiences have shaped their view of nursing, as well as how their interactions or observations of BIPOC career role models and/or career mentors have shaped their

perception. These accounts were collected to explore thematic commonalities among Minnesota BIPIC students that can inform CNEE's strategies on drawing more BIPOC students into nursing education and careers.

Finally, increasing BIPOC representation in the nursing workforce in Minnesota can best be facilitated if CNEE understands whether challenges in the effects of socioformative career decision factors of interest are unique to the BIPOC student community. Collecting survey data on perception on nursing and role model/mentorship preferences across not only BIPOC high school students, but also White students, was intended to provide group comparison that unearths similarities or differences of significance between White and BIPOC students that can further inform BIPOC-centric strategies for CNEE.

Table 1: Data Collection Matrix

Project Question	Data Source	Data Collection	Data Analysis Procedures
In what ways does the impact of socioformative career decision factors affect the perceptions and choice of nursing career pathways for BIPOC high school students in Minnesota?	High school nursing career materials and/or nursing-related course/program materials. Self-reported BIPOC and non-BIPOC high school student data regarding perceptions of nursing, experiences with nursing career materials and career role model/mentorship experience and preferences. Self-reported BIPOC nursing higher education student data regarding perceptions of nursing, experiences with nursing career	Request nursing career materials from 933 high school counselors using contact data from Minnesota Department of Education. Target qualitative interviews with at least 12 BIPOC high school students in MN, six current BIPOC nursing higher education students in MN and six current BIPOC nurses in MN. Make available an optional brief survey on nursing	Deductive and inductive thematic document analysis based on APA Inclusive Language Guide - Second Edition (2023) Quantitative document analysis - measures of central tendency on non-inclusive / non-representative terms in documents Inductive and deductive thematic coding and analysis of interviews with high schoolers, nursing students and nursing practitioners. Quantitative

| | materials and career role model/mentorship experience and preferences.

Self-reported BIPOC nursing professional data regarding perceptions of nursing, experiences with nursing career materials and career role model/mentorship experience and preferences. | perceptions to a minimum of approximately 200 high school students (all race/ethnicity) via Qualtrics online survey administration. | nonparametric summary statistics for all eleven survey questions.

Nonparametric sign tests for racial/ethnic groups in comparison to overall median responses on survey questions 2, 3, 5, 8, 9 and 10. |

Data Collection Methods

For inquiry of the single project question, a mixed-methods approach was employed, including document analysis of nursing career materials within Minnesota high schools, quantitative administration and analysis of Likert-type surveys to current high school students and qualitative interviews of current high school students, current postsecondary nursing students and current nursing practitioners. To protect identities of project participants, surveys have been designed to offer complete anonymity, while qualitative interviews were conducted with every effort to minimize collection and documentation of participant names or other identifying information. Interview participants were anonymized in transcripts, and recordings and transcripts of the interviews were stored in a secure location throughout the project and destroyed upon project completion.

Survey participants within high schools were asked to take the survey voluntarily, and compensation was not offered. Interview participants were each compensated with a $10 gift card for each 30- to 40-minute interview session.

In inquiries related to lived experiences for BIPOC students, positionality of the interviewer and/or project team can play a critical role in how the project may be perceived by participants, the data collected from those participants and the preconceptions, biases and interpretations by the project team during data analysis. To attempt to mitigate negative effects of researcher positionality on the data collection for this project, participants were informed that as a white male student seeking a terminal degree in Leadership and Learning in Organizations at Vanderbilt University, I approach this work as an ally and as an advocate. I attempted to maintain awareness of potential implicit biases created by my positionality, as well as to employ vigilant attempts to mitigate those potential biases.

Tools and Protocols

Data collection to investigate the socioformative career decision factor of high school career counseling materials initiated through an email request to high school counselors to provide current versions of the materials they provide to students related to the nursing profession. A form email (Appendix A) was sent to 933 identified high school counselors using publicly available staff contact data on the Minnesota Department of Education website. The initial email was sent on December 26, 2023. A follow up email was sent on April 1, 2024. Three additional responses were received from the April follow up for a total of 15 responses. Of the responding schools, four created and/or curated their own materials related to career exploration. Nine schools indicated that they

currently use materials from the Minnesota Career Information System (MCIS) hosted by the Minnesota Department of Education.

Table 2: Document Analysis Request and Response

Initial Requests	Responses	Response Rate	Materials Used
933	15	1.6%	School-created/curated nursing materials - 4 Minnesota Career Information System nursing materials - 9 No nursing materials used - 2

Quantitative survey data collection was accomplished by leveraging existing relationships with Minnesota high schools by Summer Hagy, State Advisor and Executive Director of the Minnesota Chapter of Health Occupation Students of America (HOSA). An informational recruitment sheet (Appendix B) was distributed to high schools, and whole classes of eleventh graders in participating schools were made aware of the optional electronic survey and given an opportunity to complete it. The survey was intended to not only collect data on BIPOC experiences with socioformative career decision factors of interest, but also evaluate BIPOC student experiences against those of a comparison group of white students.

The electronic survey was authored and administered via the Qualtrics online survey site/tool. The survey included eleven total questions, which were grouped around themes of exposure to nursing through materials and/or available role models or mentors (six questions) and effective and preferred development contexts to inform how and by whom students believe they are best influenced (five questions). The questions were Likert-type questions on a five-point scale: 1-Strongly Disagree; 2-Somewhat Disagree; 3-Neither Disagree nor Agree; 4-Somewhat Agree; 5-Strongly Agree.

Questions around exposure to nursing focus on how high school students perceive nursing in relation to themselves, whether they have been exposed to nursing career materials, the presence of nursing role models or mentors in their lives and their perceived ability to visualize themselves as nurses and achieve a career in nursing if they so choose. These questions address both career material and role model/mentor socioformative decision factors within the conceptual framework of the project.

Table 3 below provides examples of questions asked within the Qualtrics survey. For a full list of items, see Appendix C.

Table 3: Likert-type Qualtrics Survey Example Questions

#	Theme	Question	Response Form	Conceptual Frame
2	Nursing Exposure	The nursing career materials I have received from my school make it seem possible for me to achieve a career in nursing.	Likert	Career Materials
3	Nursing Exposure	I or my family have a personal relationship with someone in nursing who has cultural and/or life experiences similar to mine.	Likert	Role Model / Mentor
6	Nursing Exposure	I believe a career such as nursing would not be available or suited to me because of my cultural, racial or ethnic background.	Likert	Access
7	Role Model Influence	I learn best from others whom I perceive as just like me.	Likert	Role Model / Mentor, Cultural Competence & Empathy
8	Role Model Influence	When considering the influence of a role model or learning from a mentor, it is more important to have common interests than a common culture, race or ethnicity.	Likert	Role Model / Mentor, Cultural Competence & Empathy

Data collection for qualitative interviews was initiated through recruitment efforts by both Summer Hagy for high school students and Jennifer Eccles for both current postsecondary nursing students and current practitioners in the workforce. These three groups were identified for participation in qualitative interviews in order to obtain not only the experiences of current high school students, but also of college students who have chosen to pursue nursing education and nurses who have arrived into the Minnesota nursing workforce. The recounting of experiences by these three longitudinally diverse groups may provide insights into how perspectives on nursing change over time relative to socioformative career decision factors introduced (or absent) in high school.

Similar to with survey participants, an informational recruitment sheet (Appendix B)

was distributed to high schools, as well as potential interviewees at Minnesota college nursing programs and current nursing staff. A total of twenty-four interviews were targeted - twelve among current high school students, six among current postsecondary nursing students and six among working nurses.

Interview questions focused on the role of high school career materials as experienced currently by high school students, and as experienced in the past for current college students and nurses. In addition, questions focused on career influencers and role models and/or mentors and how experience with them shaped the interviewee's perception of nursing. Three separate protocols were developed, one for each group (high school, college and practitioner). Questions were largely similar with additional follow up in the college and practitioner

protocols to explore how perceptions may have changed over time.

Table 4 below provides a sample of the qualitative interview protocol questions for high school students. For a full list of qualitative protocol questions for high school, college nursing student, and nursing practitioner participants, see Appendix D.

Table 4: High School Participant Qualitative Interview Protocol Sample Questions

High School Student Protocol	
Interview Question	
1) As a high school student, describe your thoughts and perceptions when you think about nursing as a potential career. a) What aspects of nursing are appealing to you and why? b) What aspects of nursing are not appealing to you and why?	Social Construction
2) As a (Black, Anishinaabi, Dakota, Latinx, etc.) student, tell me about your feelings regarding whether you could imagine yourself as a nurse? a) If you wanted to become a nurse, what types of barriers do you think would prevent you or hold you back? b) What types of support would help you achieve a nursing career?	Access / Preparation
3) Describe the ways in which you've been exposed to nursing through your school career counselors, materials, etc.. a) Did these experiences encourage you that you could achieve this profession? Why or why not?	Career Materials
4) Describe a time when you learned something from someone you considered to be "just like you" or very similar in background. a) What were some aspects of your interaction that made learning effective? b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?	Role Model / Mentor
5) Now describe a time when you learned something from someone you considered to be very different from you. a) Was it more difficult to learn from them? In what ways? b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.? c) What types of things would you have wanted the person to understand that would have made the experience more productive for you? Why would these understandings have been important?	Role Model / Mentor

Data Collection Timeline

Data collection for the project began in December 2023 and concluded in May 2024.

The table below highlights the collection milestones.

Table 5: Data Collection Timeline

Milestone	Start	Finish
Request materials from high schools - 1st request	12/26/2023	12/26/2023
Collect materials returned from first request	12/27/2023	3/31/2024
Request materials from high schools - follow up request	4/1/2024	4/1/2024
Collect materials returned from follow up request	4/2/2024	4/30/2024
Administer qualitative interviews with nursing students and nursing practitioners	4/22/2024	5/15/2024
Administer qualitative interviews with high school students	4/29/2024	5/22/2024
Activate Qualtrics survey	4/29/2024	4/29/2024
Deactivate Survey and extract responses	5/15/2024	5/17/2024

Recruitment Materials

Summer Hagy (High Schools) and Jennifer Eccles (Nursing Students and Practitioners) leveraged their existing relationships with educators, nursing students and current nurses to recruit interview and survey participants. Using the project summary recruitment document (Appendix E) and the informed consent form (Appendix F), participants were contacted and, if interested, instructed to contact me as the project owner and interviewer.

Part VI: Data Analysis Results

Data Collection Results

While the recruitment and participation of the target audience for data collection was constrained in several ways, data collection did yield a wealth of data from which insights can be gleaned relative to the project question. The realized sum of data points for each of the three data collection instruments - nursing career documents, quantitative Likert survey responses, and qualitative interviews - fell short of targets, yet still provided ample data for analysis.

Nursing Career Materials Document Analysis

From the initial December 2023 request to 933 school guidance counselors, responses were received from twelve schools. Three additional responses were received from the April follow up for a total of 15 responses. Of the responding schools, four created and/or curated their own materials related to career exploration. Nine schools indicated that they currently use

materials from the Minnesota Career Information System (MCIS) hosted by the Minnesota Department of Education. The remaining two schools responded to indicate that they currently do not provide nursing-specific materials to their high schoolers but do offer coursework that highlights nursing among other health service professions.

Among schools curating their own collection of career guidance materials, each school maintains an ecosystem of documents, links to external resources, videos and other artifacts related to nursing and other health professions. The Minnesota MCIS platform, which requires user login credentials, provides even more extensive resources for students. In total, 28 total web pages, documents or other artifacts were collected from which insights into career materials could be derived.

Table 6: Document Analysis Request and Response

Initial Requests	Responses	Response Rate	Materials Used
933 schools	15 schools	1.6%	School-created/curated nursing materials - 4 schools Minnesota Career Information System nursing materials - 9 schools No nursing materials used - 2 schools **28 total artifacts reviewed**

Likert Survey Response

Initial recruitment efforts for survey responses were ineffective and thus required a final push in the month of May to secure an acceptable n-count. Because recruitment methods leveraged HOSA leadership broadcasting the need for survey responses to a large but unknown population of school staff and students, calculation of response rates was not possible.

The final number of responses reached 69. Of the 69 total responses, four respondents were omitted from analysis because they answered fewer than 25% of the 11 questions. The remaining 65 respondents answered 100% of the 11 questions.

In follow up discussions with some of the school staff, students were less inclined to complete the survey because, while it represented a less

significant time commitment than the qualitative interviews, it lacked the compensation element contained with interviews. Future survey data collection should consider potential funding for some form of minor compensation but would need to balance response rates with the available budget.

Qualitative Interviews

As noted above, the target collection for interviews was twelve current BIPOC high schoolers, six current BIPOC nursing students and six current BIPOC practitioners within their first five years in the nursing workforce. Recruitment occurred through Summer Hagy of HOSA and Jennifer Eccles of CNEE and included numerous rounds of requests to schools and health service provider networks. From the initial round of requests in early April, only one interview (a high schooler) was scheduled before the end of the month. At that time, HOSA requested a more visually stimulating one-page flier that they felt would stimulate interest. Another volley was sent to the schools with little additional activity. On May 20, one additional exchange with Summer Hagy and Jennifer Eccles finally succeeded in getting

participants to sign up. Ultimately, I was able to conduct eleven interviews ranging from 16 to 37 minutes in length. Six of the interviews were conducted with current high school students (50% of target), and five were conducted with current postsecondary nursing students (83.3% of target). Unfortunately, despite repeated efforts to engage with current working nurses, I was unable to complete any interviews successfully with that target group. One individual scheduled an interview, but we determined at the time of meeting that she was a White female and thus outside the scope of inquiry.

Seven additional participants scheduled interview times but either canceled, were no shows or, in one case at the nurse practitioner level, did not qualify based on the criteria for participation. This yielded an overall completion rate for scheduled interviews of 61%. The table below summarizes the qualitative interview collection, including success rates and individuals interviewed from each of the three target participant groups, including gender and date of interview.

Table 7: Qualitative Interview Participants

High School (target 12)	Nursing Student (target 6)	Practitioner (target 6)
Success Rate		
50%	83.3%	0%
Interview Participants		
Participant 101 - Female 5/14/24	Participant 201 – Male - 5/22/24	
Participant 103 - Female 5/24/24	Participant 203 - Female 5/20/24	
Participant 105 - Female 5/24/24	Participant 204 - Female 5/28/24	
Participant 108 - Female 5/27/24	Participant 205 - Female 5/24/24	
Participant 109 - Female 5/23/24	Participant 206 - Female 5/23/24	
Participant 111 - Female 5/22/24		

Data Analysis Plan - Socioformative Nursing Career Materials

The mixed methods of data collection employed for this project require a mixture of analytical methods to interrogate and evaluate resulting data. Regarding high school nursing career materials provided to students, I employed quantitative and qualitative document analysis on the materials received from schools, quantitative analysis of Likert-scale survey responses to questions relevant to the career materials, and qualitative analysis of interview responses to questions related to career materials.

Quantitative Document Analysis

- Problematic language frequency distribution: Each set of documents was reviewed against a list of racially/ethnically problematic words or phrases to avoid from the American Psychological Association Inclusive Language Guide, Second Edition (2023).
- Inclusive visual representation frequency distribution: Each set of documents and corresponding links or other artifacts was reviewed for visual representativeness across racial and ethnic demographics to determine frequency of BIPOC or multi-racial nursing images vs. White-only nursing images.

Qualitative Document Analysis

- Coding: Artifacts were reviewed and coded deductively to align with two principles from the Inclusive Language Framework developed within the Haas School of Business at University of California at Berkeley (2024): 1) inclusive language conveys respect to all people; and 2) inclusive language recognizes diversity (2024). Inductive coding was also performed iteratively on the artifacts to explore additional thematic commonalities.
- Thematic analysis: Upon completion of deductive and inductive coding, thematic analysis was used to determine common themes across documents.

Quantitative Survey Analysis

- Relevant summary statistics: Because survey response data is based on Likert-scale ordinal response data, typical measures of central tendency and dispersion of mean and standard deviation are not relevant for this analysis. Instead, frequency distribution of responses on the 5-point Likert scale were calculated and reported, both at the overall aggregate level and for various racial/ethnic subgroups. In specific relation to socioformative nursing career materials, summary statistics were focused primarily on the following survey questions:

#	Theme	Question
1	Nursing Exposure	I have received information and/or been exposed to nursing as a career option.
2	Nursing Exposure	The nursing career materials I have received from my school make it seem possible for me to achieve a career in nursing.
4	Nursing Exposure	Based on the exposure I have had, I understand what is required of me to achieve a career in nursing.

- One-sample sign tests: A series of one-sample sign tests was performed on each of the eleven Likert-scale items to determine significance of subgroup responses in comparison to median

responses for the entire sample. Tests were run for all BIPOC students, for Black students, for American Indian/Alaska Native students, for Asian students and for Hispanic/Latino students. For nursing

career materials, I focused again on the three survey questions (1, 2 and 4) highlighted above.

- Mann-Whitney Rank Sum U-tests: The Mann-Whitney U-test was used to analyze dispersion of responses between White students and BIPOC students on survey question 2.

Qualitative Interview Analysis

- Interview transcription and cleanup: Two interviews were recorded within the Zoom video conferencing application and then imported into Otter.ai to automate a transcript of the discussions. The remaining nine interviews were attended by Otter.ai's automated note-taker, and a transcript was automatically generated. Transcripts were reviewed while listening to recorded audio, and transcripts were edited as necessary to remediate any errors or anomalies in the transcription process.
- Coding: Each cleaned interview transcript was initially coded deductively with the following alignment dyadic code pairs:
  - Positive impression of nursing vs. negative impression of nursing
  - High impact from career materials vs. low/no impact from career materials
  - Reliance on homogeneous role models/mentors vs. openness to heterogeneous role models/mentors
  - Positive role model/mentor experience vs. negative role model/mentor experience
  - Technology-embracing vs. technology-adverse (this seemingly tangential dyad was included for the purpose of exploring a theme from the literature - virtual proctoring)

For socioformative nursing career materials, I focused on the positive vs. negative impressions and high impact vs. low/no impact from career materials code pairs. In addition to these deductive codes, each interview was also coded inductively as numerous rich themes emerged that were not initially understood or anticipated as part of the project.

- Thematic analysis: Similar to qualitative document analysis, thematic analysis was used on coded interview transcripts to identify themes in participant responses.

Triangulation of Results

The analysis of quantitative and qualitative document analysis, quantitative survey analysis, and qualitative interview analysis provide three rich but distinct windows into perceptions and impacts of nursing career materials. Results from each analytical area were reviewed comparatively for consistency or deviations to provide a holistic view of the results.

Data Analysis Plan - Socioformative Role Model/Mentor Engagement Preferences

As with socioformative nursing career materials, I employed a mixture of data analysis methods for the quantitative and qualitative data collected specific to role model/mentor engagement preferences.

Quantitative Survey Analysis

- Summary statistics and one-sample sign tests: My quantitative analysis of impacts and preferences from role model/mentor engagement used the same quantitative analytical methods employed for nursing career materials but were focused primarily on the following survey questions:

#	Question
3	I or my family have a personal relationship with someone in nursing who has cultural and/or life experiences similar to mine.
5	If I were interested in a career in nursing, I am confident I could achieve it.
6	I believe a career such as nursing would not be available or suited to me because of my cultural, racial or ethnic background.

7	I learn best from others whom I perceive as just like me.
8	When considering the influence of a role model or learning from a mentor, it is more important to have common interests than a common culture, race or ethnicity.
10	I believe I could be positively influenced by or learn well from a role model/mentor whose culture, race or ethnicity is different from mine.

Qualitative Interview Analysis

- Coding: With respect to role model/mentor engagement preferences, deductive coding was most reflective from the following code pairs:
  - Reliance on homogeneous role models/mentors vs. openness to heterogeneous role models/mentors
  - Positive role model/mentor experience vs. negative role model/mentor experience
- Thematic analysis: Thematic analysis was also used on coded interview transcripts to identify themes in participant responses specific to role model/mentor engagement preferences.

Triangulation of Results

Results from each analytical area were reviewed comparatively for consistency or deviations to provide a holistic view of the results.

Analysis and Writing Support

Quantitative analysis on Likert-scale survey questions was performed with the use of Microsoft Excel. While Excel does not provide ready-made nonparametric test functions, sign tests for survey questions were performed manually but with support for mathematical operations inherent in the software. No writing support was leveraged in the project.

Socioformative Nursing Career Materials Document Analysis Results

As noted in the Data Collection Results section above, nursing career materials were reviewed from five sources. The most prolific information was from the Minnesota Department of Education's (MnDOE) MCIS system. MnDOE is headquartered in metropolitan Minneapolis, Minnesota. Of the remaining schools providing access to materials, one was an intermediate school district in metro St. Paul, one was a small Northwest suburb of Minneapolis, one was a large district in a medium-sized city in Southwest Minnesota, and one was a small community school district in Southwest Minnesota.

Performing quantitative analysis on the 28 documents, site pages and other artifacts from these five sources, I performed keyword / key phrase search for terms to avoid from the APA Inclusive Language Guide. The search did not yield a single hit across the documents and sites reviewed.

The most observable indicators of inclusivity within the observed materials were the visual representation of nursing students and professionals. From the materials analyzed, 19 images of nurses or health professionals were included. Of the 19 images, 16 included one or more BIPOC individuals, with only three images incorporating only White medical professionals. One source linked to an NBC Television hosted video detailing the typical day in the life of a nurse. This video presented a Latinx female nurse and the rewards and challenges she encounters every day as a nurse in the labor and delivery unit of a New York City hospital.

In qualitative analysis of the nursing career materials provided, while there generally was no text or phrasing that overtly spoke to inclusivity, all documents aligned well with University of California at Berkeley's Inclusive Language Framework principles of respecting all people and recognizing diversity. One source includes

explicit language in the mission and core values of their Health Science Magnet Program. Their stated mission is:

> "To develop future leaders in health/science/medical fields by offering themed, integrated curriculum, and technical skill development through core academic learning as well as career, and technical education that when combined; will *meet the needs, and interests of a diverse group of learners*, challenge and advance the knowledge of each individual, and inspire and promote the highest level of achievement of all students."

The core values for the program include, "Establishing a community of diverse learners who desire a relevant way of learning in an area of strong interest." Placing a commitment to the creation of diverse learning groups and focusing on the needs of those diverse learners signals within this site that BIPOC students interested in exploring education and career in healthcare, including nursing, can expect support from the school.

Inductively, qualitative document analysis revealed substantial variability in the degree to which each set of artifacts represented the full breadth of nursing career options. This is an important consideration as currently in Minnesota, BIPOC nursing representation is concentrated within the lower-paying nursing professions (CNEE, 2023). The materials from one source included only reference to Registered Nurse as a nursing-related potential healthcare career opportunity. In another instance from another source, there was reference only to nursing assistants and the availability of a class at the school that could assist students in getting their Certified Nursing Assistant (CNA) license. This source did not include any indication of the availability of more advanced nursing careers. The materials from MnDOE's MCIS system were the most comprehensive and holistic in terms of identifying a broad range of possible nursing-related career destinations.

The table below summarizes the quantitative and qualitative document analysis for socioformative nursing career materials:

Table 8: Summary of Socioformative Nursing Career Materials Analysis

Socioformative Nursing Career Materials - Quantitative and Qualitative Analysis			
Quantitative Analysis			
Metric	**Items Analyzed**	**Observed**	**Rate**
Incidence of APA's 'terms to avoid'	28 artifacts	0	0%
Visual inclusion of BIPOC individuals in imagery	19 images	16	84.2%
Qualitative Analysis			
Thematic Summary			
- All sources/artifacts were consistent with University of California at Berkeley Inclusive Language Framework principles - Some sources embed inclusivity in their stated mission/core values - Variability across artifacts/sources in the breadth of different nursing professions represented - MnDOE MCIS nursing-related career materials are inclusive and most comprehensive among the artifacts analyzed			

Socioformative Nursing Career Materials Quantitative Survey Analysis Results

To further explore how socioformative nursing career materials were experienced by, and impacted BIPOC high school students, I analyzed survey responses to three primary Likert-scale survey questions of interest, as noted in the Data Analysis Plan sections above. The 65 survey respondents included in the analysis were all within Minnesota. Respondents were asked to indicate the race(s) / ethnicit(ies) with which they identify. The table below summarizes the racial/ethnic demographic breakdown of respondents.

Table 9: Survey Respondents by Racial/Ethnic Grouping

American Indian or Alaska Native	2	3.1%
Asian	10	15.4%
Black or African American	15	23.1%
Hispanic or Latino	3	4.6%
Middle Eastern or North African	0	0.0%
Native Hawaiian or Pacific Islander	0	0.0%
White	35	53.8%

Median and Mode Response Ratings
For Question 1 ("I have received information and/or been exposed to nursing as a career option"), for the nonparametric ordinal Likert-scale data, I calculated median and mode responses for the entire dataset of 65 respondents, as well as for various demographic subgroupings of students. The median Likert-scale rating across all survey respondents was 4 (Somewhat agree), and the mode rating was 5 (Strongly agree). Among White respondents only, the median and mode rating was 5 suggesting that White students were slightly more likely to have received information about

nursing than all students. When included as a single group, all BIPOC respondents had a median and mode rating of 4, equal to the median for all students but lower than the mode for all students. When viewed within each individual racial/ethnic demographic grouping, median and mode ratings were calculated for American Indians or Alaska Natives (4.5, N/A*), Asians (4, 4), Blacks or African Americans (4, 4) and Hispanic or Latinos (5, 5). The initial analysis suggested that there may possibly be higher perceived or real access to nursing materials for White and Hispanic or Latino students than for other demographic groups, though the data suggests that most students have received some form of nursing-related materials or other exposure to the profession.

Figure 5: Median Responses to Survey Question 1
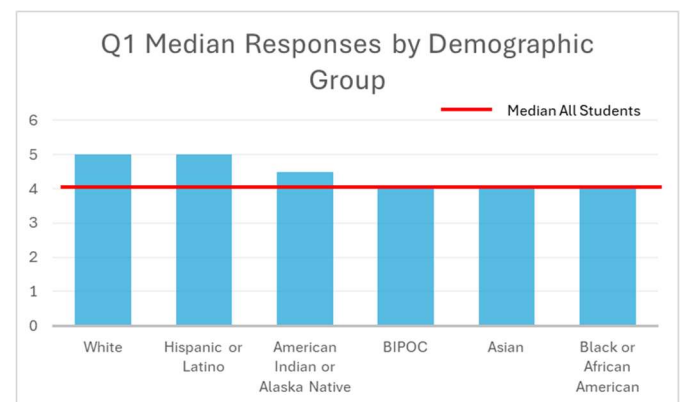
For Question 2 ("The nursing career materials I have received from my school make it seem possible for me to achieve a career in nursing."), the median Likert-scale rating across all survey respondents was 4 (Somewhat agree), and the mode rating was 3 (Neither agree nor disagree). Among White respondents only, the median rating was 4, and the mode rating was 5, again pointing to a potentially stronger belief among White students that they can achieve success in nursing than all survey respondents together. For all BIPOC respondents, the median and mode ratings were again 4, equal to the median for all students but higher than the mode for all students. The median rating for American Indians or Alaska Natives was 4.5, and a mode

for the two respondents in the subgrouping again could not be calculated. Median and mode ratings for Asian respondents were 3 suggesting potentially less favorable views by this subgroup regarding their ability to succeed in nursing. Black respondents fell in accordance with the overall median and mode at 4. Finally, Hispanic or Latino respondents had the highest median and mode ratings at 5 for each. As with question 1, White and Hispanic or Latino students rated higher than the overall median and mode ratings, as well as higher than other demographic subgroups.

Figure 6: Median Responses to Survey Question 2
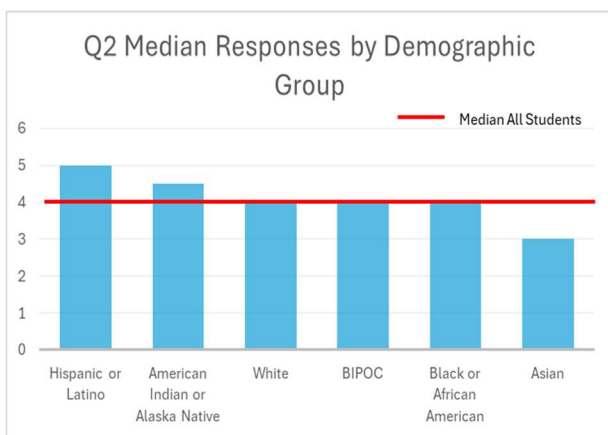
For Question 4 ("Based on the exposure I have had, I understand what is required of me to achieve a career in nursing."), the median and mode ratings across all respondents was 4. Nearly all demographic subgroups concurred

exactly with these overall median and mode ratings, with the exception of Asian students, who had a mode rating of 3, and Black students, who had a mode rating of 5.

One-Sample Sign Test for Significance

From these preliminary findings based on summary statistics for the three Likert items in question, I then conducted a non-parametric one-sample sign test for Question 1 and Question 2 to determine if there was a statistically significant difference in BIPOC, American Indian or Alaska Native, Asian, Black or African American or Hispanic or Latino student responses from those of the full sample. For this quantitative analysis, because the only data we have relative to these survey questions are the 65 responses generated by the study, the median response for all 65 respondents for each question was used as the assumed population median. For the one-sample sign test for the sample of all BIPOC students (n=28), the binomial distribution was assumed to approximate a normal distribution, and the binomial probabilities were approximated accordingly. For the one-sample sign tests for all other demographic subgroups with n ≤ 20, probabilities were obtained from the binomial probabilities table. The parameters of the one sample sign test for Questions 1 and 2 are summarized below.

Table 10: Survey Question 1 - One-Sample Sign Test by Demographic Group

Question 1 - One-Sample Sign Test by Demographic Group				
All BIPOC	**American Indian or Alaska Native**	**Asian**	**Black or African American**	**Hispanic or Latino**
α = .05 n = 28 x = 8 z = -2.2678	α = .05 n = 2 x = 1 p = 0.75	α = .05 n = 9 x = 2 p = 0.98	α = .05 n = 15 x = 5 p = 0.94	α = .05 n = 3 x = 2 p = 0.5

α = significance level n = sample size x = sign test statistic z = approximated binomial probability   p = binomial probability

Question 2 - One-Sample Sign Test by Demographic Group				
All BIPOC	American Indian or Alaska Native	Asian	Black or African American	Hispanic or Latino
$\alpha = .05$ $n = 28$ $x = 12$ $z = -0.7559$	$\alpha = .05$ $n = 2$ $x = 1$ $p = 0.75$	$\alpha = .05$ $n = 9$ $x = 7$ $p = 0.09$	$\alpha = .05$ $n = 15$ $x = 0$ $p = 1.00$	$\alpha = .05$ $n = 3$ $x = 2$ $p = 0.5$

α = significance level n = sample size x = sign test statistic z = approximated binomial probability   p = binomial probability

The one-sample sign test failed to identify significant differences in the responses of any demographic group relative to the overall sample of 65 responses.

- In a sample of 28 students identifying as one or more BIPOC racial/ethnic identities, the one-sample sign test showed no evidence that the median response to Question 1 by BIPOC students differs from that of the entire set of all student responses, $x = 8$, $p > .05$.
- In a sample of 2 students identifying as American Indian or Alaska Native, the one-sample sign test showed no evidence that the median response to Question 1 by American Indian or Alaska Native students differs from that of the entire set of all student responses, $x = 1$, $p > .05$.
- In a sample of 9 students identifying as Asian, the one-sample sign test showed no evidence that the median response to Question 1 by Asian students differs from that of the entire set of all student responses, $x = 2$, $p > .05$.
- In a sample of 15 students identifying as Black or African American, the one-sample sign test showed no evidence that the median response to Question 1 by Black or African American students differs from that of the entire set of all student responses, $x = 5$, $p > .05$.
- In a sample of 3 students identifying as Hispanic or Latino, the one-sample sign test showed no evidence that the median

response to Question 1 by Hispanic or Latino students differs from that of the entire set of all student responses, $x = 2$, $p > .05$.

- In a sample of 28 students identifying as one or more BIPOC racial/ethnic identities, the one-sample sign test showed no evidence that the median response to Question 2 by BIPOC students differs from that of the entire set of all student responses, $x = 12$, $p > .05$.
- In a sample of 2 students identifying as American Indian or Alaska Native, the one-sample sign test showed no evidence that the median response to Question 2 by American Indian or Alaska Native students differs from that of the entire set of all student responses, $x = 1$, $p > .05$.
- In a sample of 9 students identifying as Asian, the one-sample sign test showed no evidence that the median response to Question 2 by Asian students differs from that of the entire set of all student responses, $x = 7$, $p > .05$.
- In a sample of 15 students identifying as Black or African American, the one-sample sign test showed no evidence that the median response to Question 2 by Black or African American students differs from that of the entire set of all student responses, $x = 0$, $p > .05$.
- In a sample of 3 students identifying as Hispanic or Latino, the one-sample sign test showed no evidence that the median response to Question 1 by Hispanic or

Latino students differs from that of the entire set of all student responses, $x = 2$, $p > .05$.

Mann-Whitney U-test of Response Dispersion

Finally, in addition to the one-sample sign test, I conducted the Mann-Whitney rank sum U-test to determine any significance in the dispersion of BIPOC students from White students on Question 2. This Mann-Whitney U-test of BIPOC high school students ($n = 25$) and White high school students ($n = 30$) at significance level $\alpha = 0.05$ indicated that BIPOC students were significantly less likely than White students to see nursing as a career in which they could achieve success ($u = 1155$, $z = -2.961$, $p = 0.005$).

Socioformative Nursing Career Materials Qualitative Interview Analysis Results

Qualitative interviews with BIPOC high school students and current BIPOC nursing students gathered a range of rich data about general perceptions of nursing as a potential career path, informational and experiential involvement with nursing and preferences around homogeneity of role models and/or mentors when learning with and from other individuals. The qualitative analysis related to socioformative nursing career materials was largely driven by one set of questions within the interview protocols:

> "Describe the ways in which you've been exposed to nursing through your school career counselors, materials, etc. Did these experiences encourage you that you could achieve this profession? Why or why not?"

Most participants did not specifically recall receiving nursing-related career materials from their schools. One high school student recalled,

> *"I don't recall that ever happening. I know my school does offer medical health care classes. And I know the teacher because he works with me with, like, the districts who were*

planning, but I don't think any of it was specific to nursing."

Another student, now in nursing school in Minnesota, recalled that she didn't receive materials and had not, "...even covered any, like, career options in high school."

These anecdotal recollections suggest that the socioformative impact of nursing career materials is weak or non-persistent, or that students are not encountering the materials in the first place. However, many of these students are already interested in nursing or healthcare related fields. What is drawing these BIPOC students toward nursing pathways?

In many instances, it is familial connections to the nursing workforce that seem to situate these students in a position to take up nursing careers. Of the eleven total interviews conducted, 91% (or all but one participant) specifically indicated having a family member in nursing or nursing-related professions. In the case of two participants, they had multiple family members in nursing. Family influence is, itself, a socioformative factor in career decision making but one that was not initially targeted as part of this study.

BIPOC students see a parent or sibling in nursing, and it can have a positive effect on agency and their perceived ability to achieve a career in nursing and thrive. It can also shape the specific profession(s) or specialty areas in which the student may or may not want to participate within the nursing workforce. A female student currently in a postsecondary nursing program noted that, "So in high school, I really wasn't like a huge fan of the healthcare industry. I couldn't see myself in it. But at the same time, I was integrated in it. My mom, like I said, she's an LPN. And my sister was a CNA." The experience of having family members working as specific types of nurses in specific healthcare delivery contexts initially prevented her from seeing herself in the profession, and even later when she decided to attend nursing school, her experiences gave her

very explicit ideas about what she did NOT want to do as a nurse.

"I just saw how my mom was treated as a nurse because she worked in long term care. She's worked in long term care the whole time that we've been in Minnesota, and she just always, like, had a negative experience...that had happened, whether it be with her co-workers, family members of residents or residents, and so I couldn't see myself, like, in that position. But now that, like, I've grown and I have worked in long term care myself, and I've also worked in a hospital, I realized that it's just, like, the long term care setting [that I couldn't see myself in]."

The interviews exposed additional relevant themes regarding the intersection of culture and family expectations and accountability yet outside the scope of socioformative nursing career materials that are discussed further in the Additional Themes Qualitative Analysis section below.

Socioformative Nursing Career Materials - Triangulating Analytical Results

The most prominent incongruity between quantitative survey analyses and qualitative data from the interview participants relative to nursing career materials was the degree to which survey respondents and interview participants claimed to have received or been exposed to such materials. Within BIPOC students surveyed, 89.3% indicated they either Somewhat Agreed or Strongly Agreed that they had received nursing-related materials or had

been exposed to nursing as a career option. In contrast, qualitative interviews reflected much less certainty that nursing-related career materials were made available and instead focused on health-related course curricula and hands-on opportunities to get involved in healthcare fields.

Socioformative Role Model/Mentor Engagement Preferences Quantitative Survey Analysis Results

In relation to socioformative role model/mentor engagement, I analyzed survey responses to four primary Likert-scale survey questions of interest, as noted in the Data Analysis Plan sections above. As with socioformative nursing career materials, I calculated median and mode response ratings and conducted one-sample sign tests for each of the same demographic subgroups.

Median and Mode Response Ratings
In reviewing median and mode response ratings for survey questions 3, 7, 8 and 10, we again see the prevalence of nursing within the families and/or personal relationships of the survey respondents, similar to the qualitative feedback we received from participants when analyzing nursing career materials. In addition, the majority of students across all demographic groups feel that homogeneity between role models/mentors and themselves is conducive to learning or high-quality relationships but that heterogeneity does not preclude positive influence or suitable learning. The table below summarizes the median and mode response ratings for the four focus questions related to role model/mentor engagement preferences.

Socioformative Role Model/Mentor Engagement Preferences - Median and Mode Response Ratings				
Question	3. I or my family have a personal relationship with someone in nursing who has cultural and/or life experiences similar to mine.	7. I learn best from others whom I perceive as just like me.	8. When considering the influence of a role model or learning from a mentor, it is more important to have common interests than a common culture, race or ethnicity.	10. I believe I could be positively influenced by or learn well from a role model/mentor whose culture, race or ethnicity is different from mine.
All Students (n = 65)	Median = 4 Mode = 5	Median = 4 Mode = 4	Median = 4 Mode = 5	Median = 5 Mode = 5
White Students (n = 38)	Median = 4 Mode = 5	Median = 3 Mode = 3	Median = 5 Mode = 5	Median = 5 Mode = 5
BIPOC Students (n = 28)	Median = 4 Mode = 5	Median = 4 Mode = 5	Median = 4 Mode = 4	Median = 4 Mode = 5
American Indian / Alaska Native Students (n = 2)	Median = 4.5 Mode = N/A	Median = 4.5 Mode = N/A	Median = 3.5 Mode = N/A	Median = 3.5 Mode = N/A
Asian Students (n = 9)	Median = 4 Mode = 4	Median = 4 Mode = 4	Median = 4 Mode = 4	Median = 4 Mode = 5
Black Students (n = 15)	Median = 5 Mode = 5	Median = 5 Mode = 5	Median = 3 Mode = 3	Median = 4 Mode = 5
Hispanic or Latino Students (n = 3)	Median = 1 Mode = 1	Median = 1 Mode = 1	Median = 3 Mode = 3	Median = 3 Mode = 3

For Question 3 ("I or my family have a personal relationship with someone in nursing who has cultural and/or life experiences similar to mine."), most demographic groups either Somewhat Agreed or Strongly Agreed to having a family member or someone close to the family who is in nursing. The most notable outlier for Question 3 came with Hispanic or Latino students, who had median and mode response ratings of 1 (Strongly Disagree). Because this survey question is more reflective of respondent situation and not attitudinal, and the sample size of Hispanic or Latino students (n = 3) was small, the discrepant median and mode response ratings for this demographic group is not inherently concerning.

In analyzing Question 7 ("I learn best from others whom I perceive as just like me."),

BIPOC students (Median = 4, Mode = 5) appear to agree more with this statement than do White students (Median = 3, Mode = 3). Black students in particular rated this question highly (Median = 5, Mode = 5). This may be reflective of BIPOC student concerns over biases and/or prejudices from heterogeneous role models/mentors, and it could also reveal a privileged perspective from White students who share power with White role models/mentors but who also hold power within relationships with BIPOC role models/mentors. We again see Hispanic or Latino students as an outlier (Median = 1, Mode = 1). This result is surprising but may be driven by individual attitudes from a small sample.

For Question 8 ("When considering the influence of a role model or learning from a

mentor, it is more important to have common interests than a common culture, race or ethnicity."), White students agree strongly with this statement signaling a prioritization of mutual interest over racial/cultural homogeneity (Median = 5, Mode = 5). This may again indicate a privileged position for White students in the role model/mentorship relationship. BIPOC students rated this statement lower (Median = 4, Mode = 4) than did White students, though still generally agreeing with the importance of mutual interests.

The most notable data from Question 8 analysis appears to be within demographic groups of Black or African American students and Hispanic or Latino students. Here, both groups had median and mode response ratings of 3 (Neither Agree nor Disagree). This data warrants further exploration of ways to serve the needs of these students in the absence of a sufficient pool of homogenous role models and mentors.

Finally, for Question 10 ("I believe I could be positively influenced by or learn well from a role model/mentor whose culture, race or

ethnicity is different from mine."), we see a similar pattern to Question 8, with White students agreeing most strongly (Median = 5, Mode = 5) and BIPOC students (Median = 4, Mode = 5) and demographic sub-groups agreeing less strongly, though with not as much disparity from White students as with Question 8. The small sample of Hispanic or Latino students again rated the statement the lowest of any of the groups (Median = 3, Mode = 3).

One-Sample Sign Test for Significance

From these preliminary findings based on summary statistics for questions 3, 7, 8 and 10, I then conducted a non-parametric one-sample sign test for Question 7, Question 8 and Question 10 to determine if there was a statistically significant difference in BIPOC, American Indian or Alaska Native, Asian, Black or African American or Hispanic or Latino student responses from those of the full sample. The median response for all 65 respondents for each question was again used as the assumed population median. The parameters of the one sample sign test for Questions 7, 8 and 10 are summarized below.

Table 13: Survey Question 7 - One-Sample Sign Test by Demographic Group

Question 7 - One-Sample Sign Test by Demographic Group				
All BIPOC	**American Indian or Alaska Native**	**Asian**	**Black or African American**	**Hispanic or Latino**
α = .05 n = 28 x = 9 z = -1.8900	α = .05 n = 2 x = 1 p = 0.75	α = .05 n = 9 x = 0 p = 1.0	α = .05 n = 15 x = 6 p = 0.848	α = .05 n = 3 x = 1 p = 0.875

α = .significance level n = sample size x = sign test statistic z = approximated binomial probability p = binomial probability

Table 14: Survey Question 8 - One-Sample Sign Test by Demographic Group

Question 8 - One-Sample Sign Test by Demographic Group				
All BIPOC	**American Indian or Alaska Native**	**Asian**	**Black or African American**	**Hispanic or Latino**
α = .05 n = 28 x = 12 z = -0.7559	α = .05 n = 2 x = 1 p = 0.75	α = .05 n = 9 x = 2 p = 0.98	α = .05 n = 15 x = 8 p = 0.499	α = .05 n = 3 x = 2 p = 0.50

α = .significance level n = sample size x = sign test statistic z = approximated binomial probability p = binomial probability

Question 10 - One-Sample Sign Test by Demographic Group				
All BIPOC	**American Indian or Alaska Native**	**Asian**	**Black or African American**	**Hispanic or Latino**
α = .05 n = 28 x = 18 z = -1.5119	α = .05 n = 2 x = 2 p = 0.25	α = .05 n = 9 x = 2 p = 0.144	α = .05 n = 15 x = 8 p = 0.499	α = .05 n = 3 x = 3 p = 0.125

α = .significance level n = sample size x = sign test statistic z = approximated binomial probability p = binomial probability

The one-sample sign test failed to identify significant differences in the responses of any demographic group relative to the overall sample of 65 responses for any of the three questions analyzed.

- In a sample of 28 students identifying as one or more BIPOC racial/ethnic identities, the one-sample sign test showed no evidence that the median response to Question 7 (x = 9, p > .05) to Question 8 (x = 12, p > .05) or to Question 10 (x = 18, p > .05) by BIPOC students differs from that of the entire set of all student responses.
- In a sample of 2 students identifying as American Indian or Alaska Native, the one-sample sign test showed no evidence that the median response to Question 7 (x = 1, p > .05), to Question 8 (x = 1, p > .05) or to Question 10 (x = 2, p > .05) by American Indian or Alaska Native students differs from that of the entire set of all student responses.
- In a sample of 9 students identifying as Asian, the one-sample sign test showed no evidence that the median response to Question 7 (x = 0, p > .05), to Question 8 (x = 2, p > .05) or to Question 10 (x = 2, p > .05) by Asian students differs from that of the entire set of all student responses.
- In a sample of 15 students identifying as Black or African American, the one-sample sign test showed no evidence that the median response to Question 7 (x = 6, p > .05), to Question 8 (x = 8, p > .05) or to Question 10 (x = 8, p > .05) by Black or African American students differs from that of the entire set of all student responses.
- In a sample of 3 students identifying as Hispanic or Latino, the one-sample sign test showed no evidence that the median response to Question 7 (x = 1, p > .05) to Question 8 (x = 2, p > .05) or to Question 10 (x = 3, p > .05) by Hispanic or Latino students differs from that of the entire set of all student responses.

Mann-Whitney U-test of Response Dispersion
As with Likert questions for socioformative career decision factors, I also performed the Mann-Whitney U-test for dispersion on select questions related to socioformative role model and/or mentor engagement. The table below reflects the resulting statistics from the Mann-Whitney U-test.

Questions 7, 8 & 10 Mann-Whitney U-Test (α = 0.05)		
Question 7: I learn best from others whom I perceive as just like me.	**Question 8: When considering the influence of a role model or learning from a mentor, it is more important to have common interests than a common culture, race or ethnicity.**	**Question 10: I believe I could be positively influenced by or learn well from a role model/mentor whose culture, race or ethnicity is different from mine.**
Rank Sum (White) = 1365.5 Rank Sum (BIPOC) = 779.5 n (White) = 35 n (BIPOC) = 30 μ_w = 1155 σ_w = 75.9934 z = -4.941 p < 0.001	Rank Sum (White) = 1044.5 Rank Sum (BIPOC) = 1100.5 n (White) = 35 n (BIPOC) = 30 μ_w = 1155 σ_w = 75.9934 z = -0.7172 p = 0.3085	Rank Sum (White) = 922 Rank Sum (BIPOC) = 1223 n (White) = 35 n (BIPOC) = 30 μ_w = 1155 σ_w = 75.9934 z = 0.8948 p = <0.2673

In the Mann-Whitney U-test of BIPOC high school students (n = 25) and White high school students (n = 30) at significance level α = 0.05, the test indicates that BIPOC students are significantly more likely to learn best from others whom they perceive as just like them (z = -4.941, p < 0.001) but not significantly different from White students in their belief that common interests are more important in a mentoring relationship than common culture, race or ethnicity (z = -0.717, p = 0.309) or in their beliefs that they could still effectively learn from a role model or mentor of a different race, culture or ethnicity (z = 0.895, p = 0.267).

In addition to these three questions, the Mann-Whitney test was also conducted on two Likert questions related to self-efficacy in nursing. Specifically, I ran the test on Question 5 ("If I were interested in a career in nursing, I am confident I could achieve it.") and Question 6 ("I believe a career such as nursing would not be available or suited to me because of my cultural, racial or ethnic background."). For the tests, at significance level α = 0.05, BIPOC students are significantly less confident than White students in their ability to achieve success in nursing (z = -3.171, p = 0.0026) and significantly more likely to believe nursing is out of their reach specifically because of their cultural, racial or ethnic background (z = -3.342, p = 0.0015).

Socioformative Role Model/Mentor Engagement Preferences Qualitative Interview Analysis Results

Qualitative interview analysis relative to role model/mentorship engagement focused on the following interview protocol questions:

4) Describe a time when you learned something from someone you considered to be "just like you" or very similar in background.
   a) What were some aspects of your interaction that made learning effective?
   b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?

5) Now describe a time when you learned something from someone you considered to be very different from you.
   a) Was it more difficult to learn from them? In what ways?
   b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?
   c) What types of things would you have wanted the person to understand that would

have made the experience more productive for you? Why would these understandings have been important?

6) Do you have a role model or mentor who encourages you to pursue nursing?
   a) In what ways do you interact with them?
   b) How might they influence your decision on whether or not to pursue nursing education?

BIPOC Students Derive Inspiration and Agency from Homogenous Role Models/Mentors

Several interviewees discussed how various clinical or other role models or mentors with similar racial or cultural backgrounds, and with whom they had interacted or from whom they had learned, had served as a source of inspiration and had given them a distinctively cultural sense that they could accomplish success in a medical field such as nursing. One BIPOC high school student talked about role models from healthcare professions whom she had followed on social media:

> *"...so hearing a voice from someone who's in the same ethnic group as me is honestly really inspiring, because it's someone who I know I can relate to, and when I see someone achieving something that's, you know, from the same ethnic background as me – like, especially in the medical field – it's just really motivating for me and honestly reassuring in general, to know that I can achieve this as a minority."*

The recounting suggests that the connection BIPOC students have with a teacher, a role model or a mentor who shares a cultural background with the student can have meaningful impacts not only on inspiration and motivation, but also on BIPOC students' agency and perceived ability to achieve. It also suggests that virtually maintained relationships may be able to serve as a proxy of sorts when a student lacks more proximate homogenous role models

or mentors. This same student notes that, "I have not had a single teacher…in my school who have the same color skin as me…I just haven't put my mind on the fact that there could be teachers that have the same skin color as me…"

Nursing career role models can come in the form of teachers, clinicians, family friends or even from within the family. A high school student whose sister is currently in nursing school talked about what it has meant for her to have her older sister to look up to. "Seeing her being so successful throughout high school, and now into college – I think that's been very important. I don't think I would be – I would feel less comfortable with achieving – like, like having success in my life – without her, like – seeing her be able to do so well."

Inspiration does not necessarily have to be related to a long-term career outcome, either. One high school student discussed the impact a speaker at a conference for HOSA had on her. The speaker was a younger Black woman who talked about her dreams of being in the medical field. The speaker made this student think about the complicated dual narrative encountered by many minority students.

> *"And then she talked about how growing up she would hear things about becoming a doctor, but you would also hear that as a minority student, there's nothing you can really do to go above and beyond – you kind of just do what's handed to you and you kind of just go along with that and see where that takes you…But as she*

became more successful in her career after school, she realized that that wasn't it for her, and there's like, there are ways to overcome boundaries."

This message that one does not have to accept the limiting discourse of identity, delivered by someone whose background was similar to the student's, caused the student to rethink her participation in the local school HOSA chapter.

"And I think that was one of the reasons why I was like, you know, I don't just have to be a member of HOSA and kind of just do what we've been doing. I can apply to be our president – I can apply to be an officer. And I did that."

BIPOC Students Believe They Can Collaborate with Heterogeneous Role Models/Mentors, but Cultural Competence Could be Improved

In concordance with the quantitative survey data, the interview participants reflected a belief that they are able to build relationships and learn from role models or mentors who are both similar to, and dissimilar to, themselves. One female high school student experienced positive interactions with role models of different racial or cultural backgrounds.

"It's almost the same, like everyone's basically the same…I feel like they understand me because, like, nowadays, we're like, more understanding of different cultures than what we were before."

While this student's perspective was not shared by all interviewees, it was representative of the sentiment that effective communication, collaboration and learning between students and role models/mentors from different cultural backgrounds is *possible*.

That said, many participants felt collaborating with role models or mentors from different racial or cultural backgrounds was more difficult than doing so with individuals

similar to themselves. Another high school student talked about a current teacher, who is White. While she indicated that, "I do get along with him pretty well…" she also spoke to a difference in values and perspectives that she felt stemmed from their very different cultural backgrounds. She recalled an instance where the White teacher was recollecting about getting into University of Wisconsin at Madison and how he had not worked very hard to get in.

"We're so different because my whole life I've been taught that you have to study hard – you need good grades, and you need to get into a good college because as a minority student, things are not going to get handed to you as easily and you have to actually work for what you want."

The teacher talked about deciding he didn't want to put in the work to go to medical school, and so instead he chose to become a high school teacher. From this BIPOC student's perspective, the story told by the teacher was one of privilege and one that underscored the difference in the value systems with which each had grown up.

Similarly, another high school student recounted a disconnect between herself and an individual at the hospital where the student was working as a CNA. "Yeah, he didn't seem to quite understand some questions I had for him, such as how he got into Harvard or how I said I was struggling with paying some things."

In some instances, differences in cultural backgrounds manifested in affordances made by White teachers that were unwelcome, or even insulting, to BIPOC students. A nursing student recently immigrated to the U.S. talked about initial encounters with her supervisor at the nursing school.

"So the second day we met, she was,'I know English is not your first language. so I will not worry about grammatical errors.' That is horrible for a mentor to say to a mentee. So I

wish if that person is coming to relate with me, have an open mind and be willing to share everything…"

Ultimately, the experiences of these BIPOC students with role models or mentors from different cultural backgrounds comes down to the need for more cultural competence among those role models or mentors who are interacting with the students. Role models need to understand that minority students have experiences that are very different from their own. A teacher talking of college without effort or discontinuing a medical education track because he doesn't want to exert the effort need to better understand that these BIPOC students are forced to work harder for even the opportunities that he has discarded. As one student put it, "You know, sometimes some of the things that I go through nobody else will understand at my job because I'm the only black person. Yeah, and it's like, there's nothing I'm going through that any one of them has ever gone through and they may never go through."

More cultural competence can also address microaggressions, such as the experience of another current nursing student whose manager at a healthcare facility didn't bother to try learning the pronunciation of her name.

"I remember my first manager, she couldn't say my name, and she just, like, didn't care to learn it. Um, and she never really asked about it until a few months in…it just like taught me, like, you have to have a thick skin if you're gonna be – if you're going to identify as BIPOC and work, like, in this area in this state…"

Additional General Observations and Insights from Qualitative Interviews

Through the course of qualitative interviews, additional themes arose that can inform additional strategies for CNEE to expand the pipeline of BIPOC students into nursing and support the students along the way.

Unique Aspects of Supporting Immigrant Students and their Families

The pool of interview participants contained a large number (55%) of students who were first-generation U.S. immigrants or were children of first-generation American immigrant families. The conversations with these students relative to nursing as a career destination uncovered several distinct challenges for which these students may need support or specific intervention tactics. First, some students experience familial pressures to pursue career pathways other than nursing. One current nursing student recalled,

"I remember in high school; I was between a lot of different careers. I knew I wanted to work with people, um, and so it was always an expectation in my household – in my culture – that, like, you choose one of three careers – be a doctor, a lawyer or an engineer, and so, like, nursing was kind of out of the question. Um, and so, like, I came into it, thinking, like, it's, it's kind of like a stepping stone. It's not gonna be a permanent career or whatever."

This same cultural pressure from parents to pursue specific occupations was relayed by three separate interview participants. Another nursing student said, "When I was in high school, yes, so I thought of actually going for medicine, becoming a doctor."

However, based on the success he had within mathematics and statistics coursework in high school, his father pushed him in a different direction. "And that [pursuing mathematics and statistics in college] was my, my dad wanted me to pursue that…So at that young age, you know, sometimes parents have a greater and greater influence than you may want to do. So you decide to obey them." But eventually, this student found themselves in the United States surrounded by others who followed a similar

immigration path who were nurses. And it ultimately re-sparked his interest in healthcare.

These BIPOC immigrant students find themselves having to justify their pursuit of nursing to parents with specific goals and expectations for their children. One student indicated that at least his immediate family, those funding his education, have come around. He said they have come to terms with his decision to pursue nursing, "after I've, like, shared more with them." Parents within this specific subset of BIPOC families in Minnesota appear to require additional education and background reflecting nursing as a legitimate career path – one in which their children could be successful and draw on their strengths and capabilities.

In reviewing the quantitative data analysis related to nursing career materials, I noted that Asian students rated Question 2 ("The nursing career materials I have received from my school make it seem possible for me to achieve a career in nursing.") lower than other demographic groupings. Two of the three interview participants noting family pressure to choose medical doctor, lawyer or engineer as their career path were from families who immigrated from East Asian origins, and the pressure to choose a career other than nursing may have been reflected in their lack of confidence in achieving success in nursing.

Another theme that emerged from some African immigrant students and families was a tendency to see nursing as mysterious and dangerous, a sentiment that was reflected more broadly about nursing within the literature. One student indicated that in high school, he thought that nursing "was all about blood." He envisioned nursing to be entirely about a singular thing - blood.

> *"Like the medical field is generally what she saw and what I also thought of, is associated with blood. Like, you're thinking of touching blood on people, you understand that?...Okay*

and also the dead, somebody's dead and all that…So when I interacted with her [mentor], she was like, no it's more than just that – that kind of care."

The anecdote reflects an innocent impression from someone who may be an excellent nurse but who has a very limited view of what the nursing profession is and how their skills may fit into it. This student suggested that other students like himself may benefit from presentations or other information that "demystifies the whole idea, like it's not about blood. It's about saving lives. It's about helping lives…It would really change maybe the people who, who might want to get into the career and they're not. They're scared. Majority are scared."

The potential for Virtual Role Modeling and Mentorship

In the literature review section of this white paper, I reported that prior interventions attempting to increase the availability of viable mentors includes virtual mentorship, allowing students to connect with role models or mentors in another geographical location through the use of technology (Silverstein, et al., 2022). Quantitative analysis of survey question #9 ("I am able to learn from a role model or mentor who is not in the same physical location as I am.") offers encouraging results in that BIPOC students had a median response rating of 4 (Somewhat Agree) where the median response rate across all students was 3 (Neither Agree nor Disagree), suggesting that BIPOC students are open to engaging with role models or mentors who are not physically present in the same location as the student.

However, through interviews, a caution specific to relatively recent immigrant students and families regarding technology. Some interview participants explicitly noted the need for some of these first-generation students to receive more support related to technology, which would be a requirement for virtualized role model and mentorship programs.

"I have encountered several black students in the nursing program that struggle a lot. We come from the third world country, we don't know technology, and it's no fault of us…I got my first smartphone here. So there's no way I'm going to compare myself to some kid that started dealing with smartphones at two years old…. But we struggle with some of these things. And it's real and it is real for us. So I wish your research will also focus on maybe helping them with this technology part of it…."

Part VII: Findings and Recommendations

Socioformative Nursing Career Materials Findings

Document analysis performed as part of this improvement project revealed little concern with inclusive language or inclusive imagery. In fact, representation of persons of color within the images included in the documents was substantial. While the artifacts were inclusive of BIPOC individuals, there was substantial variability in coverage of the full scope of nursing occupations, creating likely situations where some students only understood nursing to be representative of the type of personal care involved in nursing assistance occupations, while other students may only be aware of registered nursing paths that require two-year or four-year college degrees.

Based on survey responses, fewer BIPOC students reported having received nursing related materials or having been exposed to nursing as a profession. While BIPOC students did tend to agree that materials and/or exposure to nursing made it seem possible for them to achieve success in the profession, BIPOC students did not agree with this statement as strongly as White students. The findings suggest there is a need to help BIPOC students make a connection between nursing and career success for themselves.

While quantitative data findings suggest that there is not a prevalent issue with inclusivity in the socioformative nursing career materials reviewed for this improvement project, qualitative interviews present a picture of students largely not paying attention to career materials provided by schools. The influence of these materials based on anecdotal reports from interviewees is minimal. Instead, students point to several alternative sources as the primary means by which they were informed of nursing as a potential career:

- Curriculum provided as part of specific health science coursework offered by their high schools. Several of these courses offer certification for positions such as Certified Nurse Assistant (CNA), as well as hands-on practice in nursing-specific tasks and activities.
- Formal presentations provided through healthcare-related organizations in which students participate (for example, Health Occupation Students of America, or HOSA). Students report a preference for these live talks or presentations and the insights they provide about career pathways.
- Affinity groups available on campuses, especially postsecondary nursing programs, which allow students to interact with others who share similar backgrounds, receive assistance with learning, financing school and other issues encountered.

Socioformative Role Model/Mentor Engagement Preferences Findings

The findings reveal that based on survey responses, BIPOC students are more likely than their White student counterparts to favor homogeneity with their own racial or cultural identities within role model/mentor relationships. This is especially true for Black student respondents.

Regarding prioritization of shared interests vs. shared race/culture, BIPOC students were supportive of shared interests but were less likely to prioritize those interests over a shared cultural background. In particular, Black and Hispanic or Latino student respondents were noticeably lower in their ratings on this question than were White students. These findings suggest that sources of additional BIPOC nursing role models or mentors, or further development of cultural competence among

available White nursing role models or mentors are needed to support the necessary diversity in nursing education and workforce.

While BIPOC students were still less likely to indicate they could be positively influenced by or learn from role models or mentors from other cultural backgrounds than White students, the majority of BIPOC students did indicate they at least Somewhat Agreed with this notion. This finding is important if initial pipeline development of BIPOC students must rely on White nursing role models and mentors. It opens the door to innovative interventions involving continuous development of cultural competence among White role models and mentors to work with BIPOC high school students.

As Minnesota's BIPOC students consider engagement with heterogeneous role models and mentors, their primary concerns involve relatability with White role models and mentors. They want role models and mentors to understand what they go through every day because of their race, ethnicity or culture. They worry about White role models/mentors being able to relate to their different experiences regarding socioeconomic status, such as their ability to pay for school. And BIPOC students worry about role model/mentor biases, prejudices and microaggressions. To create meaningful mentorship or role model experiences for these students, there must be further development of cultural competence.

Additional Insights Findings

The sample of students surveyed and interviewed for this improvement project are well-connected with the nursing profession. The vast majority of this connection is through their family members, including parents and siblings. Many of the participants have parents or siblings who are actively working in the nursing profession. This offers them the advantage of seeing nursing first-hand. However, it also serves as a skewed sample, ignoring BIPOC students throughout the state who may become

excellent nurses but who do not have access to the necessary information.

In contrast, some students' families serve not as a beacon toward nursing, but as a deterrent. Many in Minnesota's African and East Asian immigrant population may discourage their children from pursuing a nursing education and career because cultural expectations create pressure to pursue careers as doctors, lawyers or engineers. For these immigrant students to freely pursue careers in nursing, family members must be educated on the viability and criticality of nursing as a profession.

Finally, some BIPOC students, particularly students from immigrant families, must overcome challenges with perceived danger or "scariness" of nursing as a profession, as well as challenges with new technologies to which students have not been exposed prior to coming to the U.S. More BIPOC students must be exposed to messaging about the "real" day in the life of a nurse, and support should be provided to new students on using technology, from emailing instructors to potentially connecting virtually with role models and mentors.

Recommendations

The review of literature, coupled with the analysis and findings from document analysis, quantitative survey analysis and qualitative interview data, inform several recommended actions for CNEE to work toward an expanded pipeline of BIPOC students into Minnesota's nursing schools, and ultimately into its healthcare delivery ecosystem.

Career Materials Recommendations

1. **Standardized Career Materials:** Work with Minnesota high schools to adopt the MnDOE MCIS nursing-related artifacts as the default career materials to promote nursing in the state. By leveraging existing resources and promoting a single set of materials, a unified message and consistent

representation of nursing as a career can be disseminated to all Minnesota students. Standardized materials will benefit BIPOC students by ensuring that all artifacts continue to be inclusive and representative, and MnDOE can continue to address any racial or cultural challenges singularly as they arise.

2. **Earlier Engagement:** Because the BIPOC participants in this improvement project were already familiar with nursing and engaged through course curricula, drive the dissemination of materials lower into middle school populations. Higher-level, career exploration materials may be better suited for younger audiences, who then come into high school informed and prepared to take on nursing-related coursework. This addresses an issue presented in the literature that BIPOC students often don't realize the required coursework needed to pursue careers in the field of healthcare.

3. **Curriculum Review Collaboration:** While standardizing the nursing career exploration materials through MnDOE's existing materials, CNEE should seek to work with Minnesota high schools to review curricula for nursing-related courses. By reviewing curricula developed by individual schools, CNEE can again drive consistency and support BIPOC students by ensuring that curricula do not present nursing in a way that constrains those students within any certain level or specialty in the nursing field. BIPOC students will be assured of having a holistic view of available options.

4. **Live Presentation "Road Show:"** The BIPOC students in this study clearly demonstrated an affinity for live presentations or talks as opposed to written materials. With standardized career exploration materials and an

understanding of the curricula that exist in schools for nursing-related courses, CNEE should leverage volunteer staff or mentors to conduct live workshops for one or more schools throughout the state. Workshops can present highlights from the standardized exploration materials and how to access them, real-life demonstrations of nursing activities and hands-on experience with nursing tools and procedures. Road shows benefit BIPOC students by offering them a view of nursing they otherwise may not be afforded, allow them to ask questions of real nurses and inspire and energize students to participate.

Role Model / Mentorship Recommendations

5. **Virtual Mentorship:** CNEE can address shortages of nursing role models and mentors through virtual mentorship programs. BIPOC high school students can connect with role models or mentors regardless of location. CNEE can leverage their position in the National Forum of State Nursing Workforce Centers to collaborate on virtual mentorship programs. Together, the state workforce centers can identify a network of available mentors and allocate them across states with higher needs. In this way, Minnesota might be able to expand the number of available BIPOC mentors to work with BIPOC students who may consider nursing.

6. **Cultural Competency Enrichment Through Collaborative Affective Attunement:** As noted in the Review of Literature section above, Vanderbilt's Dr. Kevin Leander (2023) worked with a long-form improvisation team to study how the developed a way of knowing called Collaborative Affective Attunement. Because BIPOC students in this study indicated a willingness to learn from role models or mentors who were from different cultural

backgrounds, CNEE can work with healthcare service providers to support nursing licensure continuing education credit programs by creating persistent teams of multi-racial nurses who participate together in simulation training as part of their continuing education. Theoretically, these multi-racial teams working together on simulation activities, similar to the long-form improvisation team studied by Leander, can start to attune to one another's energy, and White participants may begin to develop enhanced cultural competence through the affective attunement to their BIPOC teammates. This benefits BIPOC students because the available White role models and mentors become more culturally competent in collaborating with students. Eventually, more students will pipeline into nursing and become role models/mentors themselves, creating a self-perpetuating engine of change.

Limitations

The study conducted as part of this improvement project informs some real and potentially impactful recommended steps for CNEE to aid in the development of a more diverse pipeline of students into Minnesota nursing. However, several limitations were inherent in the data collection and analysis, and these limitations warrant caution against making inferences that are too broad, and they encourage future research that may address the limitations and provide even better insights into how to provide access to nursing for Minnesota's BIPOC high schoolers and attract them into the profession.

1. **Data Collection - Limited Documents for Analysis:** Participation among high schools was limited. With only four schools providing curated materials, and those schools representing predominantly urban and suburban Southern Minnesota, the study

encountered a large gap in rural and Northern Minnesota schools. I hypothesize that it is within some of these rural school settings, where resources are more limited, that antiquated, and culturally problematic artifacts may continue to exist. Further research should include document analysis from a more extensive and diversified group of schools.

2. **Data Collection - Participants Predisposed to Nursing:** Recruitment of participants presented multiple challenges. Because I lacked the professional connections in Minnesota education to adequately recruit the desired participants, I leveraged CNEE's connections to drive participation. The engagement of high school participants through Summer Hagy, Director of the Minnesota chapter of HOSA, ultimately resulted in predominantly HOSA student members participating in the study. While this provided meaningful interview discussions, each participant was already invested in a future in healthcare, and in most instances, nursing specifically. Because of this, the study lacked perspective from BIPOC students who may not have already been thinking about a career in healthcare. To develop a pipeline of BIPOC students into nursing at scale, it is the perspectives of these students, who do not already have a connection to nursing, that may hold the key to drawing more BIPOC students into nursing. Future research should ensure that a portion of the participants are not already informed about, and tied to, nursing as a career pathway.

3. **Data Collection - Limitations on Longitudinal View:** The initial plan for data collection was to interview high school students, current nursing students and current practitioners of nursing to build a more longitudinal view of

BIPOC individual perceptions of nursing from high school into the workforce. However, despite substantial efforts from CNEE, we were unable to interview even a single nurse. While not the ultimate target population, I believe insights from current nurses may have even better informed the perceptions of nursing and how CNEE may support more participation from BIPOC students.

4. **Data Collection - Limited First Nation Participation:** From the outset of the project, CNEE and I discussed the desire to gain insights into the experiences, perceptions and needs of the Indigenous First Nation populations in Minnesota. This largely comprises the Dakota and the Anishinaabe nations. While we had two individuals identify on the survey responses as American Indian or Alaska Native, we were unable to engage with any Dakota or Anishinaabe members in qualitative interviews. Late in the project, I was introduced to an individual at University of Minnesota who works directly with the Indigenous groups in Minnesota, but there are specific protocols for engaging with these Nations, and there was insufficient time in the project to navigate the protocols. Future research must incorporate Anishinaabe and Dakota voices in the narrative.

5. **Data Collection - Geographic Dispersion of Participants:** As a byproduct of recruitment processes, the overwhelming majority of participants in the survey and interviews resided in Southern Minnesota, and largely in the Minneapolis metropolitan area specifically. Like notes about document analysis above, future research should focus on collecting survey and interview data from participants throughout the state, especially in the Northern portions of Minnesota.

6. **Data Analysis - Researcher Positionality:** All data were analyzed by a single researcher for this improvement project. As a What male, I committed to consume, analyze, report findings and make recommendations with a constant eye toward my own biases and position of privilege. However, I acknowledge that all data analysis was viewed through the lens of my identity, and despite efforts to maintain awareness of the potential impact of my identity on data analysis, bias of the results remains possible.

Part VIII: Conclusion

Project Question: *In what ways does the impact of socioformative career decision factors affect the perceptions and choice of nursing career pathways for BIPOC high school students in Minnesota?*

While this improvement project suggests limited impact of socioformative career decision materials on BIPOC high school students' perceptions and choice of nursing career pathways, the materials do provide an opportunity to engage with a younger audience of students to ensure high school students have already been presented with these materials. The standardization across Minnesota of career materials and the engaging presentation of information in live sessions with students ensure that all Minnesota students receive the same message about nursing and that misconceptions about the breadth of options are addressed.

Socioformative role model and mentor engagement remains one of the most important factors in BIPOC high school students considering and engaging in nursing-related coursework and career pathways. The continued expansion of available role models and mentors through opportunities like virtual mentoring and through the continued development of cultural competence among White role models and mentors will provide BIPOC high school students the information, inspiration and collaboration needed to draw more and more into Minnesota's nursing education programs and nursing workforce.

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Appendix A: Form Email for Document Analysis Solicitation to Minnesota High School Counselors

Good day:

My name is Greg Laffey, and I am currently in a doctoral program in Education at Vanderbilt University. As part of my program, I am working with Center for Nursing Equity and Excellence (https://www.mncnee.org/) to address a problem of practice they are facing. One of the Center's objectives is to enhance participation in postsecondary nursing education and the nursing workforce for underrepresented students.

One focus in our project is to look at potential support for Minnesota high schools in the nursing career documentation that is used to present the profession to middle school and high school students in the state. I'm planning on a detailed document analysis to look at ways to better attract minority students into nursing education and careers. I am writing to ask if you would be willing to share with me any career materials or documentation you currently provide to your students at Park Center IB World School. Electronic copies can be shared via email at: greg.laffey@vanderbilt.edu. Please email me at that same address if you only have physical media and would like to send via postal mail.

Also, in March 2024, I will be working to conduct interviews and/or focus groups with high school students regarding their experience with nursing as a potential career path and their perceptions of nursing as a profession and barriers to their participation in that occupation. Please let me know if you would be willing to help connect me with students in your school. Based on your interest/willingness and after I receive approval from our Institution Review Board, I can work through the necessary school staff to coordinate and schedule time in the Spring.

If you have any questions, please do not hesitate to reach out via email or phone. Thank you so much for your assistance and consideration, and I hope to hear from you soon!

#	Theme	Question	Response Form	Conceptual Frame
1	Nursing Exposure	I have received information and/or been exposed to nursing as a career option.	Likert	Career Materials
2	Nursing Exposure	The nursing career materials I have received from my school make it seem possible for me to achieve a career in nursing.	Likert	Career Materials
3	Nursing Exposure	I or my family have a personal relationship with someone in nursing who has cultural and/or life experiences similar to mine.	Likert	Role Model / Mentor
4	Nursing Exposure	Based on the exposure I have had, I understand what is required of me to achieve a career in nursing.	Likert	Academic Preparation
5	Nursing Exposure	If I were interested in a career in nursing, I am confident I could achieve it.	Likert	Access
6	Nursing Exposure	I believe a career such as nursing would not be available or suited to me because of my cultural, racial or ethnic background.	Likert	Access
7	Role Model Influence	I learn best from others whom I perceive as just like me.	Likert	Role Model / Mentor, Cultural Competence & Empathy
8	Role Model Influence	When considering the influence of a role model or learning from a mentor, it is more important to have common interests than a common culture, race or ethnicity.	Likert	Role Model / Mentor, Cultural Competence & Empathy

9	Role Model Influence	I am able to learn from a role model or mentor who is not in the same physical location as I am.	Likert	Virtual Model / Mentorship
10	Role Model Influence	I believe I could be positively influenced by or learn well from a role model/mentor whose culture, race or ethnicity is different from mine.	Likert	Role Model / Mentor, Cultural Competence & Empathy
11	Role Model Influence	I am comfortable learning in a live virtual environment.	Likert	Virtual Model / Mentorship

High School Student Protocol	
Interview Question	
2) As a high school student, describe your thoughts and perceptions when you think about nursing as a potential career. c) What aspects of nursing are appealing to you and why? d) What aspects of nursing are not appealing to you and why?	Social Construction
2) As a (Black, Anishinaabi, Dakota, Latinx, etc.) student, tell me about your feelings regarding whether you could imagine yourself as a nurse? c) If you wanted to become a nurse, what types of barriers do you think would prevent you or hold you back? d) What types of support would help you achieve a nursing career?	Access / Preparation
3) Describe the ways in which you've been exposed to nursing through your school career counselors, materials, etc.. b) Did these experiences encourage you that you could achieve this profession? Why or why not?	Career Materials
4) Describe a time when you learned something from someone you considered to be "just like you" or very similar in background. c) What were some aspects of your interaction that made learning effective? d) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?	Role Model / Mentor
5) Now describe a time when you learned something from someone you considered to be very different from you. d) Was it more difficult to learn from them? In what ways? e) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.? f) What types of things would you have wanted the person to understand that would have made the experience more productive for you? Why would these understandings have been important?	Role Model / Mentor

6) Do you have a role model or mentor who encourages you to pursue nursing?
   c) In what ways do you interact with them?
   d) How might they influence your decision on whether or not to pursue nursing education?
	Role Model / Mentor

7) Do you have any other thoughts or comments you would like to add regarding your experience(s) with or perceptions of nursing as a career option?	All

Nursing Student Protocol

1) When you were a high school student, describe your thoughts and perceptions when you thought about nursing as a potential career.
   a) What aspects of nursing were appealing to you and why?
   b) What aspects of nursing were not appealing to you and why?
   c) What variables ultimately led to your decision to pursue education in nursing?
   d) What would you tell your high school self about nursing now that you are studying it in college?
	Social Construction

2) As a (Black, Anishinaabi, Dakota, Latinx, etc.) student, tell me about your feelings in high school and now regarding whether you could imagine yourself as a nurse?
   a) What types of barriers did you think would prevent you or hold you back? How do you feel about those now?
   b) What types of support would help you achieve a nursing career? Have those changed?
	Access / Preparation

3) Describe the ways in which you were exposed to nursing through your school career counselors, materials, etc.. a) Did those experiences encourage you that you could achieve this profession? Why or why not?	Career Materials
4) What, if anything, would you have preferred to be different in your high school experiences related to nursing that you feel would have better prepared you or set you up for greater success?	Access / Preparation

5) Describe a time when you were influenced by, or learned something from, someone you considered to be "just like you" or very similar in background.
   a) What were some aspects of your interaction that made learning effective?
   b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?
	Role Model / Mentor

6) Now describe a time when you were influenced by, or learned something from, someone you considered to be very different from you.
   a) Was it more difficult to learn from them? In what ways?
   b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?
   c) What types of things would you have wanted the person to understand that would have made the experience more productive for you? Why would these understandings have been important?
	Role Model / Mentor

7) Did you have a role model or mentor who encouraged you to pursue nursing when you were in high school?
   a) In what ways did you interact with them?
   b) How did they influence your decision to pursue nursing education?
	Role Model / Mentor

8) Do you have any other thoughts or comments you would like to add regarding your experience(s) with or perceptions of nursing as a career option?	All
Nursing Practitioner Protocol	

1) When you were a high school student, describe your thoughts and perceptions when you thought about nursing as a potential career.
   e) What aspects of nursing were appealing to you and why?
   f) What aspects of nursing were not appealing to you and why?
   g) What variables ultimately led to your decision to pursue education in nursing?
   h) What would you tell your high school self about nursing now that you are studying it in college?
	Social Construction

2) As a (Black, Anishinaabi, Dakota, Latinx, etc.) student, tell me about your feelings in high school and now regarding whether you could imagine yourself as a nurse? c) What types of barriers did you think would prevent you or hold you back? How do you feel about those now? d) What types of support would help you achieve a nursing career? Have those changed?	Access / Preparation
3) Describe the ways in which you were exposed to nursing through your school career counselors, materials, etc.. a) Did those experiences encourage you that you could achieve this profession? Why or why not?	Career Materials
4) What, if anything, would you have preferred to be different in your high school experiences related to nursing that you feel would have better prepared you or set you up for greater success?	Access / Preparation
5) Describe a time when you learned something from someone you considered to be "just like you" or very similar in background. a) What were some aspects of your interaction that made learning effective? b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.?	Role Model / Mentor
6) Now describe a time when you learned something from someone you considered to be very different from you. a) Was it more difficult to learn from them? In what ways? b) In what ways did the interaction affect your confidence in being able to learn the skill/knowledge/etc.? c) What types of things would you have wanted the person to understand that would have made the experience more productive for you? Why would these understandings have been important?	Role Model / Mentor
7) Did you have a role model or mentor who encouraged you to pursue nursing when you were in high school? a) In what ways did you interact with them? b) How did they influence your decision to pursue nursing education?	Role Model / Mentor
8) Do you have any other thoughts or comments you would	All

like to add regarding your experience(s) with or perceptions of nursing as a career option?	

Doctoral Capstone Project Qualitative Interviews
Greg M. Laffey, PMP, MBA, MA

Project Purpose:
The purpose of this improvement project is to assist the Center for Nursing Equity and Excellence in expanding the pipeline of capable nursing students, ultimately closing the gap between nursing providers and future nursing care demand in Minnesota. This project is specifically focused on the experiences of Black, Indigenous and people of color (BIPOC) individuals, from high school career consideration to postsecondary nursing education to the nursing workforce.

The interviews conducted under this project will be used to explore how nursing career literature and materials provided by schools, as well as the availability of nursing role models and mentors of similar or dissimilar backgrounds, have shaped the perception of nursing, including its attractiveness and perceived attainability for BIPOC students.

Who We Want to Interview:

Interviewee Attribute	Target Population(s)
Race / Ethnicity	We seek a representative sample of BIPOC individuals in Minnesota, including but not limited to: • Black individuals • Indigenous individuals, including members of Anishinaabe nations and Dakota nations • Hispanic individuals • Other people of color (e.g., Hmong, Somali, Afghani, Syrian, Nigerian)
Current educational / career status	• Current students in high school • Current students in postsecondary nursing programs • Current nursing professionals within the first five (5) years in the field
Nursing professional status	• Nurses still in apprenticeship • Nurses post-apprenticeship

Interview Format: 30 - 40 minutes in-person or virtual (Zoom or MS Teams videoconference)

Compensation: Participants will receive a $10 gift card for participating.

Contact Greg Laffey, greg.laffey@vanderbilt.edu to discuss further or sign participants up.

Quality Improvement - Increasing BIPOC Participation in Minnesota Nursing

Purpose of the project: The purpose of this improvement project is to assist the Center for Nursing Equity and Excellence (CNEE) in expanding the pipeline of capable nursing students, ultimately closing the gap between nursing providers and future nursing care demand in Minnesota. This project is specifically focused on the experiences of Black, Indigenous and people of color (BIPOC) individuals, from high school career consideration to postsecondary nursing education to the nursing workforce.

The interviews conducted under this project will be used to explore how nursing career literature and materials provided by schools, as well as the availability of nursing role models and mentors of similar or dissimilar backgrounds, have shaped the perception of nursing, including its attractiveness and perceived attainability for BIPOC students.

How will you participate?: If you decide to volunteer, you will participate in a single interview session lasting approximately 30-40 minutes. Interviews may be conducted in person or virtually via videoconference, depending on your location and your personal preference. Interview questions will be primarily open-ended, allowing you to provide your own narrative of your experiences. With your permission, interview sessions will be recorded to allow the interviewer to focus on the conversation and ask follow up questions where necessary. You will not be asked to state your name on the recording.

Time required: The interview will take approximately 30 - 40 minutes.

Risks: While we do not anticipate any direct risks to you as a participant, we understand that reflection and narratives around your experiences as a potentially marginalized individual may elicit a range of emotions.

Benefits: In gratitude for your sharing, you will receive a $10 gift card. You will also be assisting CNEE in drawing more BIPOC representation into nursing, which in turn will provide better health care for the BIPOC community and contribute to more equitable health outcomes.

Confidentiality: Your responses to interview questions will be kept confidential, and the single interviewer for this project will be the only individual with access to recordings. At no time will your actual identity be revealed. All recordings will be deleted once written transcripts, which will remove all identifying information, have been compiled. Transcripts will be deleted upon completion of the project.

The interview recording will be stored in a secure location available only to the interviewer, until deletion. We will not use your name or any information that would identify you in any publications or presentations.

Participation and withdrawal: Participation in this project is completely voluntary, and you may refuse to participate or withdraw from the study at any time. You may withdraw by informing the interviewer that you no longer wish to participate. You may skip any individual question during the interview.

Agreement:

When recording begins for the interview, you will be asked if you have reviewed the consent form and if you agree to participate. Your verbal confirmation will act as your informed consent, and you will not be asked to sign any documents or otherwise document your identity.