

**FACULTY CLASSROOM SUPPORT TOWARD THE NATIVE AMERICAN COLLEGE  
STUDENT'S EDUCATIONAL EXPERIENCE: A QUANTITATIVE STUDY**

by

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## ABSTRACT

The purpose of this quantitative study is to test the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience. Sociocultural Learning Theory and the Social Integration Model are the theoretical frameworks this study used to connect to the related research on the Native American college student experience. Research scarcity and gaps in the existing scholarship justified the study. “What is the relationship between faculty’s perceived supportive classroom behaviors and undergraduate Native American college students’ self-reported persistence to graduation?” and “What is the relationship between faculty’s perceived supportive classroom behaviors and graduate Native American college students’ self-reported persistence to graduation?” are the two research questions asked. A quantitative research approach used Spearman’s rank correlation to analyze  $n=315$  Gates Millennium Scholars and finalists who identified as Native American from 1999 to 2017 (BMGF, 2021). The Spearman rank correlation test conducted in SPSS 29 revealed a statistical significance of perceived faculty support behaviors on the Native American undergraduate ( $r_s(138) = .617, p < .001$ ) and graduate ( $r_s(173) = .566, p < .001$ ) degree experience. The statistical significance rejected both null hypotheses ( $H_{01}$  and  $H_{02}$ ) in this study. Additionally, these statistical findings aligned with several related studies in the literature, increasing the validity of the results. This research may offer higher education institutions information on improving faculty support models for Native American college students. As more higher education institutions invite ways to advance equity for underrepresented students, this research study may help institutions enhance the academic experience for Native American students. A mixed methods research approach using a larger sample size is recommended for future research.

*Keywords:* Native American college student, Native American student success, scholarship awardees, faculty support models, faculty support behaviors, underrepresented student communities, advancing educational equity

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### **Dedication**

This dissertation is dedicated to my husband, Tony, my son, Jake and my daughter, Paige. We are The Fantastic Bivens Four, and our superpower is unwavering encouragement and support for one another. I am grateful for this encouragement and support from you all as I embarked on this doctoral adventure. "The family is one of nature's masterpieces."- George Santayana

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## Table of Contents

ABSTRACT.....	2
Copyright Page.....	4
Dedication.....	5
Acknowledgments.....	6
List of Tables .....	10
List of Figures.....	11
List of Abbreviations .....	12
CHAPTER ONE: INTRODUCTION.....	13
Overview.....	13
Background.....	14
Historical Context.....	16
Social Context.....	18
Theoretical Background.....	20
Problem Statement.....	22
Purpose Statement.....	23
Significance of the Study .....	23
Research Question .....	24
Definitions.....	25
Summary.....	26
CHAPTER TWO: LITERATURE REVIEW.....	28
Overview.....	28
Theoretical Framework.....	28

Related Literature.....	34
Summary.....	61
<b>CHAPTER THREE: METHODS.....</b>	<b>65</b>
Overview.....	65
Research Design.....	65
Research Question .....	68
Hypotheses.....	68
Setting and Participants.....	69
Setting.....	69
Participants.....	70
Instrumentation .....	71
Gates Millenium Scholar Web Based Survey.....	71
Procedures.....	74
Data Analysis .....	77
Summary.....	80
<b>CHAPTER FOUR: FINDINGS.....</b>	<b>82</b>
Overview.....	82
Research Questions.....	82
Null Hypotheses.....	83
Descriptive Statistics.....	83
Results.....	91
Hypothesis(es).....	92
Summary.....	94

CHAPTER FIVE: CONCLUSIONS .....	96
Overview .....	96
Discussion .....	96
Implications .....	104
Limitations .....	110
Recommendations for Future Research .....	113
Conclusion .....	114

## List of Tables

Table 1. Original and Limited Survey Participants for Dependent Variable: My Instructor Cared About Me .....	76
Table 2. Original and Survey Limited Participants for Dependent Variable: I Had at Least One Instructor that Excited Me To Learn Learn.....	76
Table 3. Participant Response Summary for Likert Scaled Survey Questions.....	84
Table 4. Cronbach's alpha for Internal Consistency.....	85
Table 5. Participant Response Summary for Stratified Likert Scaled Questions.....	89
Table 6. Spearman Rank Correlation Test on Native American Undergraduate Students.....	90
Table 7. Spearman Rank Correlation Test on Native American Graduate Students.....	91
Table 8. Inferential Statistical Results for Hypotheses.....	92
Table 9. RQ1 Discussion Summary.....	101
Table 10. RQ2 Discussion Summary.....	103

## List of Figures

Figure 1. Sociocultural Learning Theory	
Components.....	30
Figure 2. Zone of Proximal Development	
Model.....	31
Figure 3. Social Integration	
Model.....	32
Figure 4. Ordinally Ranked Variables Assumption Test.....	86
Figure 5. Monotonic Relationship Assumption Test.....	87
Figure 6. Faculty Training Framework for Creating and Maintaining Healthy Student Relationships.....	108
Figure 7. Cultural Responsive Pedagogy.....	110

### **List of Abbreviations**

Bill and Melinda Gates Foundation (BMGF)

Collaborative for Academic, Social and Emotional Learning (CASEL)

Gates Millennium Scholars (GMS)

Gates Millennium Scholars Program (GMSP)

Inter-university Consortium for Political and Social Research (ICPSR)

Minority Supported Institution (MSI)

More Knowledgeable Other (MKO)

National Center for Education Statistics (NCES)

Predominately White Institute (PWI)

Social and Emotional Learning (SEL)

Tribal College and University (TCU)

Zone of Proximal Development (ZPD)

## CHAPTER ONE: INTRODUCTION

### Overview

Native American invisibility in scholarly research and academia continues to negatively impact equitable college access and post-secondary degree completion for Native American college students (American Indian College Fund, 2019). Many studies focus on specific tribes and institutions or favor an exploratory qualitative approach when seeking answers to what makes a Native American college student enroll, persist, and graduate. According to the National Center for Education Statistics (2020), only 0.6% of college enrollment is represented by Native American students, and only 42% completed their postsecondary degree, compared to 64% for all students. The research dearth of academic support initiatives for Native American college students and their academic experiences justifies additional research on the relationship between higher education instructors on Native American college students and their experience in higher education institutions (Cech et al., 2019). Gallup (2019) suggested that Native American college students choose a tribal higher education institution because of an emotionally supported and culturally responsive academic environment; however, 83% of Native American college students are more likely to attend public postsecondary institutions (Postsecondary National Policy Institute, 2022). As public higher education institutions are encouraged to seek ways to mitigate historical losses and improve equitable learning for Native American student communities (Fetter & Thompson, 2023), the research findings from this study may provide insights to assist with instructional support model initiatives for these institutions. The following chapter will provide historical, social, and theoretical context along with the problem, purpose, and significance of the study to help higher education institutions understand perceived level of support influences from instructors and the relationship it has on the Native American college

student's degree completion.

### **Background**

The Native American college student demographic continues to be the most underrepresented in higher education institutions, creating barriers to Native American college access and degree attainment (The Hunt Institute, 2022). Native American college students continue to make up only 1 percent of United States postsecondary students compared to 29% for other minority groups (National Center for Education Statistics, 2018). Research on Native American higher education is often limited or unanswered due to smaller sample sizes (American Indian College Fund, 2019). Although Native American college students make up a small percentage of higher education enrollment, the racial microaggression of invisibility continues to be perpetuated in the education system (Echohawk, 2021). This invisibility may continue to impact Native peoples and their communities. Native American college student enrollment has seen a 37% decrease in enrollment since 2010 (National Center for Education Statistics, 2022).

To combat the continuation of Native American college student invisibility in public higher education institutions, tribal colleges and universities were created. During the 1960s, tribal colleges were introduced as an option for Native Americans to seek education beyond high school while being supported through culturally responsive instruction and academic services (Bombardieri & Horwedel, 2022). The culturally responsive services and instruction may suggest that this model focuses on helping students belong. According to the Center for Community College Engagement (2019), 88% of students attending tribal colleges and universities felt a strong sense of belonging. The average graduation rate at tribal colleges and universities is 21%, which is slightly lower than the US public institution rate of 23% (Integrated

et al., 2019); however, a student's increased sense of belonging is connected to increased persistence and retention (Turner & Zepeda, 2021). A student's sense of belonging can be influenced by several academic factors, including emotionally supportive faculty interactions.

Additionally, scholarship and financial aid programs have been created to help mitigate financial barriers preventing Native Americans from pursuing their college degrees. The Gates Millennium Scholars program is an example of a scholarship that removes financial barriers to higher education for students from underrepresented communities (GMSP.org, n.d.). This scholarship program is available to African American, Native American/Alaska Native, Hispanic, and Asian American student communities (GMSP.org, n.d.). Kumar (2023) stated that targeted financial aid and scholarship programs for minority college students can improve educational access and equitable opportunities.

Filling in the Native American college student experience research gaps may ensure equitable representation of this historically misunderstood and underrepresented community in the higher education industry, specifically in predominately white public institutions. Echohawk (2021) determined that 72% of Americans want more Native American visibility through curriculum and educational support changes. Additions to the scholarship with a quantitative approach may provide further insights and perspectives to the current qualitative exploratory studies that tend to be favored in the scholarship. The Native American college students regarded close relationships with higher education institution faculty and administrators as an essential part of the community ideology (Sinclair, 2020). Determining the strength of the Native American college student experience to their relationships with faculty to support belongingness can help close the gap in this population's scholarly research.

The following paragraphs will provide the study's historical, social, theoretical, and conceptual contexts as a lens for recommendations and future implications. The historical background will discuss the impact of minimal research and data on Native American college students' academic experiences. The social background is provided to show readers the benefits of additional research for the Native American peoples, higher education institutions equitable education initiatives, and society's dilemma with racial inclusiveness. Lastly, a theoretical and conceptual framework is used to ground the research study's perspective from reviewing significant scholarly work.

### **Historical Context**

Education and Native Americans hold a dark and oppressive past together. In the 19<sup>th</sup> century, the United States government created the Indian Civilization Act Fund to establish boarding schools to erase Native Americans of their Indigenous culture and assimilate them into white settler culture (NABS, 2023). Education was used as a weapon for Native American students. Little (2023) described the assimilation and annihilation of Indigenous culture and identity from the late 19<sup>th</sup> century to the mid-1950s in US boarding schools through various assaults like chopping off braids, replacing Indigenous names with white Christianized names, and tribal language suppression. The Native American silencing and erasure in boarding schools demonstrated in the past maintain their influence in today's educational institutions across the US (Minthorn & Nelson, 2018).

Native American invisibility, a form of modern-day racism in higher education institutions (May & McDermott, 2021), continues through minimal data collection and scholarly research. Many higher education institutions continued to perpetuate this invisibility and marginalization with minimal data on the academic outcomes of Native American students

(Shotten et al., 2023). Administrators and scholars have recognized the lack of research on this invisible student population. Waterman (2019) stated that earlier research focused its approach through a deficit-based lens. Scholarly research completed through the deficit-based lens placed blame on the victims or minority groups for their lack of academic preparation and success and can continue oppression and inequities in educational and societal environments (Davis & Museus, 2019). This deficit-based research approach continues to marginalize and uphold Native American stereotypes (Brockie et al., 2022).

Today, scholars and institutions address the deficit-based research approach by shifting to an appreciative inquiry approach through multiple phenomenological research studies on the Native American college student experience. Appreciative inquiry uses a strengths-based approach for determining positive attributes that relate to success (Moore, 2019). Congruent findings from these studies determine that Native American college student's academic success and persistence increase with incorporating Native culture in academics, tribal college collaborations, hiring Indigenous faculty members, and including family members in the college experience (Shotton et al., 2023). Further research determined that Native American college students credit a positive college experience when they developed strong relationships and created a community like their tribal community on their respective campuses (Sinclair, 2020).

More recent scholarship has found through appreciative inquiry that Native American college persistence and degree completion are created from welcoming and supportive environments through faculty and professional staff experiences (Bordelon & Atkinson, 2020). The future of Native American college student success may show potential with collaborations between tribal colleges and public higher education institutions. Tribal colleges and universities have dedicated their pedagogy and student services to help Native American students rebuild and

reinforce their tribal cultures (Bryan, 2019). Traditional four-year institutions partnering with tribal colleges and universities (TCU) have bridged the education gap for Native American students seeking continued education by modeling TCU's academic and professional staff support and outreach to Native American students (Bryan, 2019).

### **Social Context**

Higher education institutions that regard educational access and equitable faculty support as an organizational initiative may positively impact the disparities underrepresented student communities have endured in society. Disparities in postsecondary education for Native Americans have shown correlations to intergenerational poverty (JEC, n.d.). Native Americans continue to have the highest poverty rate in the United States at 24.5% compared to the official 11.8% general United States population poverty rate (Semega et al., 2019). Hershbein et al. (2020) found that people who obtain a postsecondary degree reduce their poverty rates. Additionally, the Native American unemployment rate continues to be higher at 7.9% compared to the United States national average unemployment rate of 3.9% (US Bureau of Labor Statistics, 2022). Limited education levels negatively impacted the unemployment rate (van Zon et al., 2017). Higher education institutions can provide students with an inclusive learning environment to increase their job skills for employability, which may help lower the Native American and general United States population unemployment rates. Increased levels of higher education are more likely to increase access to occupations with higher wages (US Bureau of Labor Statistics, 2020).

Education attainment is also related to reducing health disparities from socioeconomic inequalities and improving the total well-being of the United States population (Zajacova & Lawrence, 2018). Long-term health benefits for students obtaining a postsecondary degree are

pronounced in marginalized student communities (Vable et al., 2020). Lawrence (2017) found that college graduates receive a positive return on their health because they have access to higher wages to pay for health programs like smoking cessation, gym memberships, preventative health screenings, and mental health resources. The connection between higher education and improved health may be a key factor for increased attention on the Native American college student experience. Currently, Native Americans show a 19.1% fair or poor health status in adulthood, which is higher than the national average of 14.5% (National Center for Health Statistics, 2022). Furthermore, mental health can be positively impacted by attaining higher levels of education (Williams, 2023). Psychiatric disorders are higher in the Native American population compared to the non-Native population, which may correlate to higher rates of suicide, premature death, stroke, and limited utilization of health care (Chung et al., 2023).

Additionally, Native American students succeeding in higher education attributed disproving stereotypes, educating others, and spanning two cultural worlds as ways to overcome societal ethnic-racial disadvantages (Cech et al., 2019). Stevens et al. (2018) regarded racial awareness as a mechanism to reduce forms of racial discrimination or microaggressions from faculty and students through welcoming campus climates. This awareness is important as undergraduate enrollment increases in underrepresented and marginalized student populations (de Bray et al., 2019). Additionally, postsecondary institutions that equalize educational access and equitable learning to help increase a diverse student community within the institution may provide educational benefits to all their racial and ethnic student groups. These educational benefits positively impact society through increased cultural awareness, racial awareness, community service, multicultural perspectives, and conscious reflection (Clayton, 2021; Simi & Matusitz, 2022).

## **Theoretical Background**

The variables and concepts central to the research are faculty supportive behaviors in the classroom and Native American college student degree holders. Based on these variables, theories by Vygotsky, Tinto, and Indigenous decolonizing paradigms are analyzed from the scholarship to support the theoretical framework for this study. Vygotsky (1978) viewed learning as student-centric and the importance of culture, community, and caring relationships as key learning components. These components allow the learner to be impacted by the world around them through tools, mediation, technology, and cultural norms (Scott, 2021). Sociocultural learning theory offers advantages to the learner with the zone of proximal development (ZPD). ZPD describes the concept of novice and expert in the learning process and instructional tools to help the learner reach their potential (Rahmatirad, 2020). Mercurieff and Roderick (2013) concluded that Indigenous learning and teaching are demonstrated through social relationships within the tribal community, group work, elder wisdom, observation, emulation, reflection, experiences, visuals, games, earth-based curriculum, and humor. ZPD from Sociocultural Learning Theory shows a strong connection to elder wisdom from Indigenous learning worldviews. Additionally, relationship influences on learning from Sociocultural Learning Theory connect to tribal community and group work from Indigenous learning. Tools and technologies relate to visuals and games between each worldview. This demonstrates how Vygotsky's sociocultural learning theory connects to the Indigenous teaching and learning worldview.

Tinto's Social Integration Model is the additional lens through which the faculty supportive behaviors in the classroom variable in this study will be used. The Social Integration Model stated that connections with faculty and academic staff increase underrepresented student

communities' enrollment, academic success, and retention (Tinto, 1993). Sense of belonging incorporated into the faculty support models at higher education institutions increased Native American student persistence (Tachine et al., 2016). The idea is that students who socially integrated with their faculty and peers increased their educational intrinsic motivations, which positively impacted college program retention (Reindl et al., 2022). Indigenous guiding principles informed by Kirkness and Barnhardt encourage educators that respect and reciprocity between faculty and Indigenous students are important to their academic success (Biin et al., 2018). Tinto's Social Integration Model and Indigenous wholistic principles connect the importance of faculty support behaviors in the classroom to the Native American college experience. Being seen, heard, and respected helps Native American college students acclimate and integrate into their college campus.

Indigenous decolonization educational paradigms encourage relationality through healthy connections with humans and non-humans (Abes et al., 2019). The theoretical frameworks that ground this study encompass the importance of human connection in the learning process. The connections between Vygotsky's Sociocultural Learning Theory and Tinto's Social Integration Model, along with Indigenous learning worldviews as grounding frameworks for this study, describe the Two-Eyed Seeing approach in Indigenous people's research. The Two-Eyed Seeing approach advocates the importance of viewing the world through Western and Indigenous ways of knowing (Wright et al., 2019). Weaving between Western mainstream and Indigenous knowledge acknowledges that each worldview holds strengths that can be applied to all learners, regardless of race and culture (Matthews, 2021).

## Problem Statement

The problem is the lack of research on the Native American college student experience, which is important for improving equitable access and learning in higher education institutions (King & Brigham, 2022; Martorelli et al., 2018; Tachine et al., 2016). Often, the Native American college student population is minimized to just an asterisk in data collection and research studies. The NCAI (n.d.) described Native Americans as the *asterisk nation* because of the lack of data collection, analysis, and reporting by federal and state agencies. Increased scholarship in the Native American college experience will inform higher education decision-makers on how to create, revise and promote faculty and instructional support models for this underrepresented and underreported student population. With the low college enrollment, persistence, and graduation rates of Native American college students, faculty and instructional support models are important for reducing the academic success gap and the racial invisibility microaggression (Bryant, 2021).

Adding to the research through various methodologies adds robust scholarship to the Native American college student experiences. Very few current studies rely on quantitative research analyses to explore questions and discuss findings on the Native American college experience; rather, the preferred data collection method is through participant interviews from a qualitative approach (Rodriguez & Mallinckrodt, 2021). A quantitative research approach using a larger Native American sample size is helpful in answering the theory-guided question on the relationship between instructor support practices and the Native American student experience (Creswell & Creswell, 2018). Using findings from various qualitative research findings in the current literature and addressing the deficiencies of quantitative approaches will help converge the recommendations for the Native American college student experience. As educational

institutions join in on the core priority of advancing equity and attainment (US Department of Education, 2022), these additional findings will serve this promotion.

### **Purpose Statement**

The purpose of this quantitative study is to test the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience. This study intends to increase the quantitative research and literature on the Native American college student experience to guide higher education institutions in making informed decisions on instructor support models related to equitable college access and attainment. This study will specifically examine the relationship between perceived levels of faculty support behaviors from the Gates Millennium Scholars who identified as Native American and graduated with a college degree from 1999 to 2017. Many tribal college leaders found that a culturally supportive faculty member and a student-centered institutional model are the best practices for retaining Native American students and increasing their academic success (Bunkowski & Shelton, 2019). Recommendations will be provided based on the research findings.

### **Significance of the Study**

Insights from this study may expand on Vygotsky's Sociocultural Learning Theory and Tinto's Social Integration Model with connections to the Indigenous Knowledge worldview. These theoretical connections could expand advocacy for the Two-Eyed Seeing research approach in future studies that use Native American students. This approach provides a platform for combining Western and Indigenous knowledge to solve problems (Wright et al., 2019). As Peltier (2018) explained, the Two-Eyed Seeing research approach frames research in a meaningful, responsible, relevant, and respectful way toward Indigenous peoples.

The current literature centers on qualitative, exploratory research methods to gather insights on Native American higher education academic success from faculty involvement and support (Rodriguez & Mallinckrodt, 2021). Additional gaps in the current literature on the Native American college student's perceived experience also demonstrated limited study sample sizes for quantitative research methods (Lopez, 2020). These sample limitations included research variables focusing on one enrolled tribe, specific undergraduate programs, and individual higher education institutions. This study may serve as a basis for additional studies on faculty and student relationship strengths for other underrepresented student demographic groups. Findings from the study could inform decision-makers in higher education institutions on instructional support practices and design to elevate Native American college students' sense of belonging. Faculty support and instructional design best practices found in this study may also be replicated for other underserved student populations related to race, ethnicity, socioeconomic status, and neurodiversity. According to Gallup (2019), involved faculty, along with family support and culturally responsive institutions, positively influenced a college student's persistence rate.

### **Research Question**

To address the relationship between perceived levels of faculty support behaviors on the Native American student's college degree completion experience, the following research questions and their corresponding hypotheses that guide this study test 344 nationwide Gates Millennium Scholar recipients and finalists who identified as Native American and earned a college degree from 1999 to 2017 to ask:

**RQ1:** What is the relationship between faculty's perceived supportive classroom behaviors and undergraduate Native American college students' self-reported persistence to graduation?

**H<sub>0</sub>1:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman Rank Correlation test.

**H<sub>a</sub>1:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman Rank Correlation test.

**RQ2:** What is the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation?

**H<sub>0</sub>2:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman Rank Correlation test.

**H<sub>a</sub>2:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman Rank Correlation test.

### **Definitions**

The following terms and their definitions used in this research study are provided to establish clarity and understanding.

1. *College experience*- the experiences of college students through peer and faculty connections, valuable learning, student services, and college fit (Paterson, 2023).
2. *Culturally responsive teaching*- a way to respond to ethnically diverse students through acknowledging their cultural strengths and encompassing their cultural identity in the classroom (Pannell, 2022).

3. *Higher Education Institutions*- public or private postsecondary institutions like community colleges, tech schools, universities and state colleges that educate students to prepare them for society and the workforce (Ramaley, 2014).
4. *Indigenous peoples*- descendants of people who inhabited the world before European colonization (UCLA, 2021).
5. *Informed decision-makers*- members of a higher education institution who impact decisions for the institution, like administrative leaders, subject matter experts, change managers, project managers, external stakeholders, faculty, student services staff members, and instructional designers (Ruben et al., 2017).
6. *Native American*- an appropriate term that broadly refers to all Native or Indigenous peoples of the US, Canada First Nations, Alaska Natives, Hawaiian Natives, and American Samoans (US Department of the Interior Indian Affairs, 2017).
7. *Tribal College/University (TCU)*- colleges and universities located near Native American reservations that provide culturally responsive student support and degrees (American Indian College Fund, n.d.).
8. *Tribal college faculty*- an educator, professor, instructor, or teacher who is employed by a tribal college or university (Rajasekar et al., 2023).

### **Summary**

Native American college students continue to be an underrepresented student population for many higher education institutions. Their enrollment, persistence, and graduation rates are lower than all other student minority groups (Keith et al., 2017). The research dearth of academic support initiatives for Native American college students and their college experiences is a noted problem in the scholarship. Although the scholarship has determined that Native American

college student's academic success increased when they felt a sense of belonging because of caring and supportive faculty, the need for more research on the relationship between faculty supportive behaviors in the classroom for Native American college students justifies the purpose of this study. Many studies also focused on specific tribes and institutions or favored an exploratory qualitative approach when seeking answers to what makes a Native American college student enroll, persist, and graduate. To add to the existing research and assist with filling in the scholarship gaps, the purpose of this research study is to help answer the relationship between perceived faculty support behaviors on the Native American student's college degree completion experience. As higher education institutions increase their efforts to expand access and advance equitable learning for underrepresented student populations, the findings from this study may offer recommendations for instructional support best practices to assist in these efforts.

## **CHAPTER TWO: LITERATURE REVIEW**

### **Overview**

This chapter provides a review of the literature that focuses on the Native American college student academic experience and the institutional and faculty support models that impact it. A thematic analysis is presented in this literature review with the central themes of the Native American college student experience and faculty support models in two-year, four-year, minority supporting and tribal higher education institutions. The Sociocultural Learning Theory and the Social Integration Model theoretical frameworks will be discussed as the lens through which the review and critical assessment of the scholarship on the Native American college student experience is understood. These theoretical frameworks will also establish the lens to understand faculty support behaviors and their value in enrolling, attaining, and graduating Native American college students. This literature review supports the justification for this study and its importance in expanding the current literature on the Native American college student degree completion experience and faculty support models that impact it through quantitative insights.

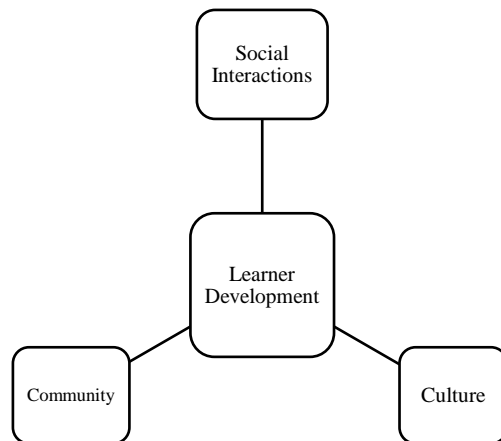
### **Theoretical Framework**

The theories reviewed within the literature are guided by the Two-Eyed Seeing research approach. While the Two-Eyed Seeing approach is not a theoretical framework, Leighton (2019) found this approach when reviewing literature centered around Native American and Indigenous peoples to provide a multi-perspective lens to the researcher and reader. Wright et al. (2019) advocated for this approach because it creates a space where Western and Indigenous knowledge collaborate. The Two-Eyed Seeing approach is present in the analysis of the literature review through research on Native American college student lived experiences, research by Native American scholars, research informed by Native American organizations and the Western

theoretical frameworks that ground the study. The Western theoretical frameworks that provide a lens for understanding the impact of faculty support on the Native American college student experience are the Social Cultural Learning Theory and the Social Integration Model.

### **Sociocultural Learning Theory**

Sociocultural Learning Theory stems from the work of Russian Psychologist Lev Vygotsky, which illustrated that students learn and improve their learning through their social interactions, community, and culture (Daneshfar & Moharami, 2018). This learning theory found that higher order cognitive development occurs in learners through social interactions that provide imitation, instruction, and collaboration (Vygotsky, 1978; Zhou & Brown, 2017). Sociocultural Learning Theory also stated that cultural values play a strong role in how learners interpret the world around them (Mcleod, 2023). The Two-Eyed Seeing approach is demonstrated in this review by using Vygotsky's Sociocultural Learning Theory to ground the study and understand the importance of cultural relevancy and faculty support behaviors in the Native American college student experience. Sumida Huaman and Abeita (2018) discussed social connectedness with a faculty member, co-created knowledge, and cultural expression as the cornerstone of Indigenous people's learning views. An example of Sociocultural Learning Theory and Indigenous knowledge collaborating in a higher education setting can be observed through a community-based assignment that offers the student an opportunity to work with their tribe. The student can then present their learnings and reflections to their instructor and peers. This student-led learning demonstrates culturally responsive instructional activities and social interaction to gain feedback from peers and the instructor. The Sociocultural Learning Theory components (Vygotsky, 1978) are summarized in Figure 1.

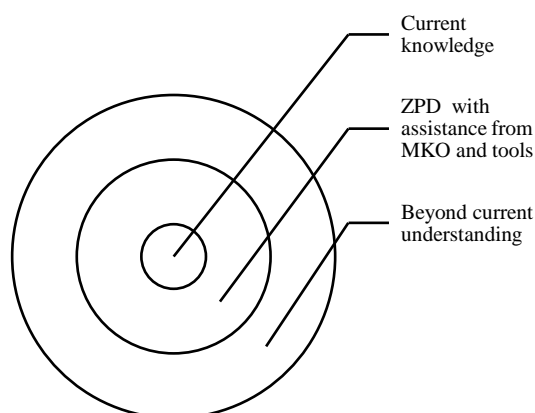
**Figure 1***Sociocultural Learning Theory Components*

Sociocultural Learning Theory determined that a learner's cognitive development is enhanced through interactions and communicating with others (Alkhudiry, 2022). Yarbrough (2018) described that full cognitive development is realized in learners through social interactions along with the More Knowledgeable Other (MKO) and the Zone of Proximal Development (ZPD). These principles provide additional context for using Vygotsky's Sociocultural Learning Theory as a framework for this study because they align with Indigenous Knowledge, which encompasses the Two-Eyed Seeing research approach. An MKO is a learning agent like a faculty member or peer that leads a learner with less knowledge to greater understanding (Jarrett, 2022). An example of the MKO principle and Indigenous Knowledge alignment is learning through elder wisdom. Indigenous worldviews identify elder teachings as an essential part of fostering the next Indigenous generations successfully in their learning

journeys (Kayira et al., 2022). Furthermore, the ZPD principle within the Sociocultural Learning Theory describes the scaffolding effect that occurs when a learner needs more support in the beginning, but that support slowly fades as the learner develops in their higher order thinking (Wald & Harland, 2022). ZPD and Indigenous Knowledge alignment are demonstrated through community support and guidance during a learning journey. Henne-Ochoa et al. (2020) described Indigenous worldviews on learning as a community commitment through support, scaffolded guidance, and observation. The ZPD scaffolded model is outlined in Figure 2.

**Figure 2**

*Zone of Proximal Development Model*



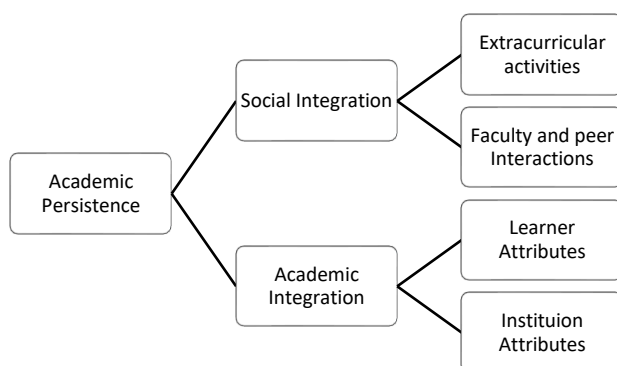
**Social Integration Model**

Social integration describes how a student interacts with their higher education social environment through peers, faculty, and administrative staff (Abdul-Rahaman et al., 2022). The Social Integration Model by Tinto (1993) stated that students from lower socioeconomic statuses tend to be at more risk of dropping out in a higher education setting if academics and social integration are lacking (Müller & Klein, 2022). These interactions may influence a Native American college student's educational outcome. Lower socioeconomic and first-generation

students tend to socialize less with faculty, staff, and their higher education communities (Adams et al., 2016). Tinto (1993) stated that students will persist with their higher education studies if they have a strong sense of belonging through engagement in extracurricular activities, academics and connections with faculty and peers. The Social Integration Model is an additional framework to ground this study because of the importance of creating a sense of belonging through faculty support behaviors for Native American college students to enroll, persist, and graduate. Tinto's (1993) integration model is outlined in Figure 3.

**Figure 3**

*Social Integration Model*



According to Brey et al. (2019), Native American college students continued to report lower numbers of six-year college graduation rates compared to Asian, Black, Hispanic, Pacific Islander, and White college students. Silverstein (2022) stated that tribal colleges and universities have seen an increase in enrollment, persistence and graduation rates because of strategic planning centered around educational practices to foster sense of belonging for Native American college students. The increase in Native American college student enrollment along with potential risks with their postsecondary persistence provides further rationale for using the Social Integration Model as another theoretical framework in this study.

The Social Integration Model also finds alignment with Indigenous knowledge through the concept of relationality. Indigenous epistemology describes relationality as the interconnectedness with people, other beings, and the land to emphasize learning (Antoine et al., 2018). Social integration describes a student's perception of their hierarchical and non-hierarchical social relationships in a college setting, which can impact their learning development and outcomes (Reindl et al., 2022). The relationality and social integration alignment encompasses the Two-Eyed Seeing research approach that offers Western and Indigenous worldviews as complementary perspectives for this study on Native American college students. Littletree et al. (2020) discussed the relationality concept from Indigenous knowledge with the importance of compassionate, loving, and caring relationships to the whole person. Social integration and relationality are demonstrated in higher education settings through interpersonal relationships with caring peers, mentors, advisors, and faculty. An example of social integration and relationality alignment to increase academic success outcomes are institutional practices that allow Native American college students to return home during the academic year to participate in ceremonies, allow for reflection on tribal stories with theoretical lessons, and connect their families with faculty members to integrate them into the educational journey (Quaye et al., 2020). The Sociocultural Learning Theory and the Social Integration Model establish complementary principles on the importance of relationships for a learner's success. These relationship principles found in both theories also show alignment to Indigenous learning worldviews, providing justification for using them as theoretical frameworks to guide this study.

## **Related Literature**

The related literature on Native American college students and their academic experiences has lacked in the higher education scholarship (American Indian College Fund, 2019; Minthorn & Shotton, 2018). This study intends to provide higher education institutions with potential frameworks for instructional models that support and positively impact Native American student's higher education experience from enrollment to graduation. These instructional support models could help higher education institutions in their equitable and inclusive educational strategic initiatives. Higher education institutions committed to equitable and inclusive learning environments provide students with economic, emotional, and cognitive benefits, especially those from underrepresented minority groups (Arum et al., 2021). Recommendations will be provided based on the findings of this quantitative study.

## **Literature Review Process**

This literature review objective is to systemically evaluate related literature on the Native American college student experience to find limitations and gaps in the research. The identified gaps and limitations will provide a justification for this study's research question and how the quantitative findings will expand the existing literature. A systemic review approaches literature with an unbiased procedure to comprehensively synthesize defined areas of related research (Gusenbauer & Haddaway, 2019). ProQuest.com and the online South College library (library.south.edu) were used as principal search systems to review related literature on the Native American college student experience. The review focused on searching for peer-reviewed journal articles that demonstrated an appreciative inquiry lens. This appreciative inquiry lens was selected because of its inclusionary approach in the field of educational research, where strengths, positive attributes, and promising best practices are drawn out (Garrett, 2022).

Reviewing research through a deficit-based lens can orient the research to victim blaming and enhance oppressive and hegemonic systems (Davis & Museus, 2019). Any peer-reviewed scholarly article that used deficit-based words like lacking, missing, high needs, underperforming, and achievement gaps were excluded from the related literature review.

A hybrid Boolean text-based search and citation networking strategy was used to find relevant and related journal articles. Sarol et al. (2018) recommended finding seed articles with a text-based approach using Boolean AND OR operators in the search field and then using these seed articles to connect cited articles and co-cited articles to retrieve relevant literature. The hybrid systemic review approach began with the following key search words:

- “Native American college student”
- Student experience
- Faculty support models
- Academic outcomes
- Tribal faculty
- Tribal colleges
- Tribal university

These key search words were limited to full text, peer-reviewed academic journal articles from 2003 to 2023. Mauldin and DeCarlo (2020) recommended reviewing related literature that is dated no more than 20 years to understand what is currently known about a topic that has limited research. Peer reviewed articles are recommended in research because the research is conducted and written by experts in the field and reviewed by other experts on validity, accuracy, and quality (Stanforth, 2020). Dissertations and theses were not included in the literature review because they are considered grey literature. Grey literature is defined as any literature that is not

peer reviewed like clinical trials, conferences, dissertations, and reports (Bonato, 2018). Once the relevant and current articles were determined, citation networking provided additional related literature to review. A total of 22 peer-reviewed journal articles were selected for this review because they met the appreciative inquiry lens, theoretical framework, and research question focus. This review is structured into the following themes: faculty support models in two-year, four-year, and tribal higher education institutions. The theoretical framework alignment is provided in this literature review to highlight this study's connection to existing research and fill in the research gaps.

### **Faculty Support Models in Two-Year Higher Education Institutions**

The role of academic support services on Native American college student enrollment, retention, and graduation is seen as an important system in postsecondary institutions. Schmidtke (2009) conducted a qualitative research study using interviews with Native American college students attending a technical institute to answer the effective instructional experiences that helped this specific group of students persist in college. Schmidtke (2009) chose a qualitative approach with an interactionist perspective to understand better Native American college students' lived experiences with their faculty interactions. Iagulli (2019) described the interactionist perspective to understand how social interactions affect emotions. The findings from the thematic analysis showed that Native American college students felt instructors who were enthusiastic about their subject matter, willing to help, provide hands-on learning, and develop a trustworthy relationship increased the persistence rate. Although this qualitative research provided insights into Native American college students' faculty interaction preferences during their educational journey, the research was limited on the correlation between these positive interactions and retention. An additional limitation of this study is that the research

provided insights from just one two-year public college on the faculty interaction perceptions by Native American students.

Schmidtke's (2016) continued research discussed the merits of academic support services in a two-year technical college and how it helped Native American college students complete their degrees. Schmidtke (2016) conducted a qualitative research study to determine how academic support services and faculty interactions helped Native American technical college students persist to the last semester. Seventeen students affiliated with a tribe were interviewed using college retention theories. Data analysis used selective coding for theme identification and found that Native American students want their academic support service faculty to act more like advocates with personalization to their academic and cultural needs (Schmidtke, 2016). The research strength is the appreciative inquiry, which focused on the important role that academic support services by faculty play in a Native American academic experience; however, the small sample size with a geographic focus on a select few tribal affiliations in a two-year technical school provided limitations to this research. Smaller sample sizes in research may increase reproducibility concerns (Jenkins & Quintana-Ascencio, 2020).

The study by Schmidtke (2009, 2016) connects to Vygotsky's Sociocultural Learning Theory and Tinto's Student Integration Model theoretical framework because of the findings related to Native American college students wanting faculty to personalize their advocacy while attending the two-year technical institution. Social engagement through faculty interactions has positively influenced a student's sense of belonging and institutional acceptance (Ahn & Davis, 2020; Miller et al., 2018) and is the principal framework in the Social Integration Model. Furthermore, the study by Schmidtke (2016) found that Native American students wanted faculty to respond culturally in their academic advocacy to help increase their positive academic

experience. This faculty interaction approach demonstrates the importance of recognizing culture as influential to a learner's cognitive development, which finds alignment to the Sociocultural Learning Theory.

The research gap between instructors' and faculty's emotional support for Native American college students in two-year higher education institutions continued in the scholarly literature. Fong et al. (2019) conducted a quantitative research study using invariance testing with 887 Native American college students attending 156 community colleges in the United States to answer how Native American community college students interpret their sense of belonging at those institutions. The findings from the invariance analysis allowed researchers to measure group or subgroup constructs against other groups or subgroups with the same question (Lopez, 2023). A multilevel modeling test was performed and showed that Native American college students felt academic relationships fostered their sense of belongingness from a traditional Western perspective (Fong et al., 2019). Tribal community, cultural identity and family were Indigenous perspectives that Fong et al. (2019) found as more consistent factors in Native American student outcomes. The Indigenous perspective regards relationships to earth, other and non-human others as traditional values (Alkholy et al., 2017). A strength of this study is that the research provided insights from 156 community colleges with a larger sample size compared to other Native American college student scholarly studies. The study suggested that researchers should use Indigenous perspectives to answer research questions when Native American participants are involved. Although this quantitative research provided insights into Native American college students' faculty relationships as an important part of their educational sense of belongingness along with other Indigenous cultural perspectives like community and

cultural identity, the research was limited to the quantifiable correlation between culturally responsive faculty interactions and relationships.

The Indigenous ways of knowing perspective used to frame the research by Fong et al. (2019) aligns with the Sociocultural Learning Theory and the Social Integration Model theoretical framework that grounds this study. Sociocultural Learning Theory states a student-centered learning environment takes place when social interactions from the learner's community, faculty, and peers are present (Preston & Claypool, 2021). Additionally, the social interaction influence from faculty who developed relationships with their Native American students, impacting their student outcomes determined by Fong et al. (2019) connects to the Social Integration Model because of the value social interactions have on a student's learning journey.

### **Faculty Support Models in Four-Year Higher Education Institutions**

Drawing connections to the research on higher education faculty and staff connections about Native American college student academic success in a two-year technical college, the sense of belonging influenced by faculty and academic support services highlights the value it provides by four-year higher education institutions. A qualitative multiple case study and cross-examination approach was conducted to find Native American college student retention strategies at three public universities (Guillory, 2009). Hunziker and Blankenagel (2021) stated that multiple case study research approaches help determine a theory about driving factors in a research question. Guillory (2009) interviewed 30 Native American college students who represented 22 federally recognized tribes and determined that financial support, relevant academic programs, and institutional social support were thematic persistence factors. An example of institutional support at universities may be multicultural centers, Native American

peer mentoring, and culturally responsive academic counseling. These institutional support system examples may find greater success in Native American retention if they align with Indigenous worldviews. This worldview or Universal Native Values draws upon respect, sharing, self-awareness, acceptance, patience, mindfulness, caring for others, honoring elders, praying, and relationality (Waterman et al., 2018). Guillory (2009) discussed that Native American college students responded in the focus group interviews that institutional support helped boost their confidence and cultural connections. The strength of the study is demonstrated by a large tribal affiliation representation and multiple case study examinations to find a persistence factor theory. However the participant sample size limits the thematic analysis reliability. Small participant sizes continued to be a consistent research gap in the related literature.

The institutional support systems on Native American college students' self-confidence to increase college degree persistence found by Guillory (2009) connects with Sociocultural Learning theory and the Social Integration Model. These theories state that socially supportive interactions influence a learner's cognitive growth and motivation to persist in their institution (Alkudiry, 2022; Tinto, 1993). Felten and Lambert (2020) described the importance of faculty, staff, and peer relationships on a student's academic outcomes, identity development, and critical thinking skills. Positive social relationships connect to higher levels of self-esteem (Harris & Orth, 2020). The reciprocity between social relationships and self-esteem could help students successfully integrate with their higher education institution.

Consistent with Guillory's (2009) research findings on institutional support to increase Native American college student persistence, Strayhorn et al. (2016) concluded that faculty influence in four-year higher education institutions enhances Native American's sense of belonging through frequent interactions. A sense of belonging is defined as connecting to others

through valuable interactions linked to increased motivation, happiness, and health (Gillen-O'Neel, 2019). The sample size from this research study included 144 Native American college students who attended predominately white institutions (PWI) and used a quantitative research approach and regression analysis to conclude that faculty influenced this student population's sense of belonging. A larger sample size with additional geographic variables bridges the limitations of the previous two-year technical institution research study. Strayhorn et al. (2016) demonstrated strengths in this research study by using two sets of statistical controls to increase the findings' validity and rigor. A limitation demonstrated in the faculty's sense of belonging influence on Native American research is the data reliance from the College Student Experience Questionnaire (CSEQ). Strayhorn et al. (2016) mentioned that the CSEQ data has little participation from tribal colleges and minority-supported institutions and justified the need to expand the literature to include research studies using increased tribal college student data.

Strayhorn et al. (2016) determined in their study that faculty interactions influenced Native American college students' persistence rates, which aligns with the Sociocultural Learning Theory and Social Integration Model in this study. An increased sense of belonging is consistent with relationality, which is an important Indigenous worldview. Strayhorn (2018) stated that a sense of belonging is a reciprocation that is valued by not only the student but also its institutional group members, like faculty and staff. Baik et al. (2019) posited that an inclusive higher education institution encompasses a learning environment that extends genuine sociocultural and emotional care to its students.

The research literature continued to show consistent themes in appreciative inquiry-based approaches in determining the influences that academic support services employed by higher education institutions can positively impact Native American college students' academic

experiences. Wilkie (2020) discussed an academic support service model at a four-year state school in Minnesota for Native American nursing students. Quantitative data was provided in the first two years of the academic support model, showing a 600% enrollment increase in nursing studies and 100% of pre-nursing first-year students retained at Bemidji State University (Wilkie, 2020). It is suggested that academic success increased Native American pre-nursing college students from academic advising, tutoring, and consistent student mentor meetings. This study demonstrated gaps in the research regarding postsecondary academic support services' relationships to Native American college experiences. The current study by Bemidji State University is a cross-sectional study. Cross-sectional studies measure data in single time points and may not fully answer behavioral causes and effects from the research variables (Thomas, 2023). Along with the limitations of a cross-sectional study, this academic support model represented just one undergraduate major at a four-year public higher education institution and does not offer insights into instructor interactions for all majors. These limitations provided further justification for this study's purpose of determining the correlation between perceived faculty support behaviors in the classroom on Native American college degree completions.

The research presented by Wilkie (2020) on the academic support services offered to Native American nursing students to increase their enrollment and retention demonstrated theoretical alignment to the Sociocultural Learning Theory and the Social Integration model because of the positively influenced intensive support by faculty. van der Zijden and Wubbels (2023) described support communities in the first year of college to positively impact the learner's social integration rate. Faculty support and interactions were a part of these first-year learning communities described by Wilkie (2020). According to Tinto (1993), faculty

interactions and peer interactions are important social systems for a student's social integration rate. This integration rate may impact a student's commitment to persist.

The Bemidji State University cross-sectional research gap provided direction to review related literature on a quantitative study done over five years at a public four-year institution in the northern plains. A survey was conducted and analyzed on college experience perceptions by Native American students. A 37% survey response rate was noted, and a regression analysis was conducted to answer research on Native American aspirational goals in a predominately white institution (PWI) (Ferguson & Huffman, 2018). Predominately white institutions refer to most higher education institutions in the United States that demonstrate an environment representative of Euro-centric symbolism and tradition (Bonilla-Silva & Peoples, 2022). Findings from this quantitative study determined that Native American students found college to help reinforce their Indigenous cultural traditions, and attending a PWI did not impede their cultural appreciation (Ferguson & Huffman, 2018). The research also suggested that post-college economic outlook is not an intended intrinsic motivation for Native American college persistence; instead, supporting the tribal community post-college is a more favored persistence factor (Ferguson & Huffman, 2018). The findings from this study related to a PWI not impacting a Native American student's collegiate experience from a cultural perspective offered potential suggestions for the scholarship and provided context to the research focus on the relationship between the perceived support interactions of academic staff and faculty on this experience. Limitations assessed by this study justified additional research as this study included one tribe in the northern plains out of the 574 federally recognized tribal entities (Indian Affairs Bureau, 2021).

The Sociocultural Learning Theory and the Social Integration Model frameworks connect to the research that Ferguson & Huffman (2018) determined Native American college students

persisted because of their motivations to give back to the tribal community. A Native American student completing a college degree and giving back to the tribal community contributed to the sociocultural practice expressed in Indigenous worldviews (Biin et al., 2018). Relationality is further expressed when Native American students persist because of their motivations to support their tribal community. Relationality is the Indigenous concept that finds social relationships to be symbiotic and interdependent for holistic intellectual growth (Elliott-Groves et al., 2020).

A similar limitation on correlational insights on support about faculty interactions was found in an additional research study on Native American college student's persistence to graduation. This limitation provided further justification for the proposed research questions on the relationship between faculty support behaviors in the classroom and the Native American college student experience. A mixed methods research approach was conducted at a public four-year university through a Likert scale survey and focus group interviews with 130 Native American college students. Multiple regression and deductive category analyses found that Native American college students preferred informal mentoring approaches (Mosholder et al., 2016). This preference found in the survey analysis suggests that informal faculty and advisor interactions provide a positive emotional support experience for Native American college students. Mosholder et al. (2016) discussed an increase in Native American college student persistence when students perceived they were welcomed and valued in the institution's community. Although the lack of correlational research on support behaviors through faculty interactions experienced by Native American college students was present in the study, the mixed methods research approach provided more insights into the data to provide a robust understanding of the hypotheses questioned (Creswell & Creswell, 2018).

The study by Mosholder et al. (2016) informed the scholarship that Native American college students favor informal mentoring relationships as a contributing factor to their sense of belonging and persistence connects with the established theoretical frameworks for this study. Sociocultural Learning Theory states that social interactions play a significant role in the learner's cognitive growth (Alkhudiry, 2022). The Social Integration Model parallels the importance and influence of social interactions by faculty and peers to the learner's academic success. Moreover, those interactions helped students to fully integrate into the institution and increased the learner's commitment to that institution (Reindl et al., 2022).

Heavy Runner-Rioux et al. (2018) expanded the literature on the Native American college student experience by providing research findings into persistence factors for Native American graduate students that Ferguson and Huffman (2018) and Mosholder et al. (2016) demonstrated for Native American undergraduate students. According to the National Center for Education Statistics (2022), 14,100 Native American students pursued postbaccalaureate degree programs, which is the lowest enrollment number for all races and ethnicities. A quantitative study used multivariate linear regression to find persistence factors for 54 Native American graduate students from 41 federally enrolled tribes and found that cultural identity, relationships, and tribal community reciprocity positively impacted persistence (Heavy Runner-Rioux et al., 2018). The analysis of fifteen independent variables on the student persistence dependent variable was a strength of this study because the factorial design provided answers to more than one research question in the study and offered additional information on independent variable interaction (Andrade, 2021). Although 42 federally recognized tribal affiliations were represented in the study, the smaller participant size and correlational information related to faculty support demonstrated limitations in the study. Expanding the literature using larger

Native American participant sizes in quantitative research approaches may provide further information on the relationship faculty support models have on the Native American college student experience.

The research findings from Heavy Runner-Rioux et al. (2018) correspond to Sociocultural Learning Theory and Social Integration Model principles because cultural identity, relationships, and community were persistence factors for the Native American graduate students. Spencer et al. (2020) described the connection of culture, identity, and relationships for developmental learning and attributed this to the human species as a social species. This evolutionary hardwiring suggested that social interactions inside and outside of the higher education institution are important for college students to persist in their academic goals. Cognitive growth is also enhanced through intersectionality because learners are influenced by various tools, social goals, and practices by belonging to multiple cultural groups. (Spencer et al., 2020). An example of intersectionality is a Native American college student belonging to their affiliated tribe and belonging to a collegiate peer group. These two groups intersect their cultural perspectives and influence an individual's development.

Oxendine et al. (2020) also expressed concerns agreed upon in the scholarship on the lack of Native American college student research, specifically on the lack of large sample sizes and quantitative methodologies. The study provided similar research questions and findings from Mosholder et al. (2016) on the correlation of mentorship and culturally responsive institutions on the sense of belonging for Native American students in higher education institutions. These studies are important as Gopalan et al. (2019) found that underrepresented minority students feel lower levels of belonging compared to other student groups at four-year higher education institutions. Data from the Multi-Institutional Study of Leadership (MSL) was used in the study

with a multiple regression analysis to determine the correlation between a non-discriminatory campus environment and a campus environment of belongingness (Oxendine et al., 2020). Contributors to Native American college students' perception of belonging on campus were found to be public and private collective racial esteem, along with a mentor on campus (Oxendine et al., 2020). Ajayi et al. (2021) corresponded with these research findings by recommending higher education institutions' ownership in creating a campus climate that offers belongingness through instruction, mentoring, campus activities, and institutional policies. Although the study provided strengths in a larger sample size of 604 undergraduate students who identified as Native American or Alaska Native from 97 higher education institutions, no tribal college or university was affiliated with the MSL data. Oxendine et al. (2020) stated that two-year higher education institutions were another limitation of the study, as the data collection from these institutions was vastly underrepresented.

Socio-psychological and social integration theoretical bases were present in the study that found Native American college students perceive a sense of belonging and a non-discriminatory campus climate through racial esteem and mentorship (Oxendine et al., 2020). These theoretical bases found in the study align with the Sociocultural Learning Theory and Social Integration Model theoretical frameworks because of the key factor in culturally inclusive campus climates. Fish and Syed (2018) discussed that higher education institutions that support Native American students and their ways of being, knowing, and traditions will see an increase in perceived belonging, social integration, and retention. Sociocultural Learning Theory posits that language, symbols, and cultural practices shape an individual's path to learning (Kahlke et al., 2019). This suggests that valuing college students and their cultural backgrounds empowers their learning potential.

Native American college student belongingness studies offer consistent findings in the related research. Chow-Garcia et al. (2022) posed several research questions on Native American college students' commitment to science majors and what cultural and psychosocial factors contributed to their belongingness in this area of study and community. The research in science majors and community belongingness is important as Native American college students are underrepresented in the science, technology, engineering, and math (STEM) majors in higher education institutions (Turner et al., 2022). Chow-Garcia et al. (2022) conducted a mixed methods research approach on 47 self-identified Native American college students attending four internship programs, two of those programs being at large universities. The mixed methods research approach was a strength of the study because it offered stronger insights into the research problem as each method has limitations on its own but integrating the two enhances the data (Creswell & Creswell, 2018). The quantitative data was collected by a Likert scale survey and then followed up with in-person interviews for qualitative data collection. Descriptive statistics were conducted on the Likert scale survey, while a thematic analysis was used for the in-person interview response collection.

Based on the mixed methods research, Chow-Garcia et al. (2022) found that Native American college students pursuing science majors and careers linked their persistence to their cultural identity with support from academic mentors, faculty, and tribal community members. Role model mentors who influenced the Native American college science students were those who hosted hands-on experience, encouraged their potential, built trustworthy relationships, valued their cultural identity, and identified as Native American (Chow-Garcia et al., 2022). The findings from this study were important for expanding the scholarship on Native American college student belongingness and positive impacts from faculty and mentors. However, the

study was limited to the participant sample size, undergraduate major, and geographic collection areas. Further research is needed to expand the literature to include more higher education institutions and college majors to gain insight into Native American college student experiences impacted by faculty support.

Chow-Garcia et al. (2022) found in their study that Native American cultural identity was a contributing factor to persistence and belonging in science majors. These findings align with the Sociocultural Learning Theory and the Social Integration Model theoretical frameworks because cultural background and acceptance are established principles in these theories. Culture is the foundation of how humans interpret and make meaning of the world around them, according to Vygotsky's Sociocultural Learning Theory (McLeod, 2023). Moreover, students' commitment to academic programs and higher education institutions is related to the normative and structural integration by students under the Social Integration Model (Nicoletti, 2019). Chow-Garcia et al. (2022) described students' integration into their science major as positively impacted by their caring relationships with mentors and faculty.

A smaller participant size limitation was also found in Rodriguez and Mallinckrodt's (2021) research study that interviewed ten first-year Native American college students on their perceived resiliency and persistence factors in a predominately white institution (PWI). First-time, full-time college students tend to have higher attritions rates from their first year to their second year (Pratt et al., 2017). According to the National Student Clearinghouse Research Center (2022), Native American first-year college persistence rates in 2020 decreased compared to other first-year college student groups. The qualitative study conducted by Rodriguez and Mallinckrodt (2021) found through a thematic analysis that Native American college students relied on their family support in the first two months of their first year, and eventually, they

found their faculty support to help them feel more connected on campus. Participants also contributed their strong ties to their cultural identity and integrated into campus programs with college transition support as persistence factors (Rodriguez & Mallinckrodt, 2021). The research study provided important insights into Native American college student persistence related to the transition period for their first year but demonstrated limitations to excluding participants from other higher education institutions like tribal colleges and universities. The study could have also included a mixed methods approach for quantitative data to help validate the perceived persistence factors.

The study by Rodriguez and Mallinckrodt (2021) demonstrated connections to the Sociocultural Learning Theory and Social Integration Model theoretical frameworks because of the social and cultural integration findings on Native American students' perceived persistence in their first year of college. Vygotsky claimed that humans are influenced by cultural perspectives and social interactions, and this forms the foundation for cognitive growth (Huang, 2021). Rodriguez and Mallinckrodt (2021) described the participant responses regarding family relationships, faculty interactions, and their cultural identity as consistent themes in their college persistence. Additionally, Tinto (1993) theorized that students will persist if they can socially and academically integrate into the campus environment. Rodriguez and Mallinckrodt (2021) discussed campus activity integration as a contributing factor that helped Native American first-year college students connect and persist.

The consistent research sample size limitation on the Native American college student experience related to faculty and instructional excitement continued with a qualitative, exploratory study conducted in a California four-year public higher education institution. Stewart-Ambo (2021) investigated the relationship between Native American college students

and their impact on building tribal communities. Native American college graduates stated giving back to their tribal community is one of the motivational goals for completing their postsecondary degrees (Salis Reyes, 2019). Stewart-Ambo (2019) interviewed five Native American college students who were enrolled in a California tribe and found that social mobility, family support, giving back to the tribe, and a culturally responsive curriculum were motivators during their college experience. The culturally responsive curriculum as a motivator in the research findings relates to this study because it determined that projects, group work, assignments, and lectures that could be applied back to the tribal community enhanced their college experience (Stewart-Ambo, 2019). This suggests that tribal application-based instructional activities created by faculty increase a student's excitement to learn. Faculty that participated in culturally responsive teaching can help improve the graduation rates of their underrepresented student communities (Hutchinson & McAlister-Shields, 2020). Structural and axial coding was used to determine themes for addressing Stewart-Ambo's (2021) research question after collecting responses from the five Native American participants. The 90-minute interviews provided a strength to the qualitative study because it offered the participant an opportunity to deeply reflect on their experience and make meaning of it. Although the study by Stewart-Ambo (2021) demonstrated strengths in exploratory interviewing to understand the participant's experiential perspectives, limitations to the study were present in the demographic isolation of focusing on a federally recognized California tribe. The research could expand its focus on additional tribes across the region to increase the research reliability.

Stewart-Ambo (2021) found that giving back to the tribal community and culturally responsive instructional activities created stronger motivation for Native American college students to persist in their postsecondary degrees. These findings relate to the Sociocultural

Learning Theory because learning is guided by social interaction and perceived through context (Glăveanu, 2020). Education becomes a communal success between Native American college students and their tribes (Howard & Kern, 2019). Additionally, the Social Integration Model is demonstrated in the study by Stewart-Ambo (2021) through the motivation to persist because the Native American college students were emotionally invested in their academics to give back to the tribe. Smith et al. (2020) described low self-monitoring students in the Social Integration Model as having stronger ties to their higher education institutional community because of their emotional investment.

Emotionally invested higher education faculty are also responsible for instilling hope in Native American college students in a study conducted by Charbonneau-Dahlen (2015). Support from retention program mentors and faculty increased hope in Native American students at a midwestern university's undergraduate nursing program (Charbonneau-Dahlen, 2015). Mana et al. (2020) stated that social support and hope are critical for increasing college students' self-efficacy. A cross-sectional study using qualitative and one quantitative question to triangulate hope scale themes for 25 Native American and 24 non-Native American undergraduate nursing students helped answer Charbonneau-Dahlen's (2015) research focus on how hope is perceived for student success in a program with high attrition rates. The methodological triangulation to capture data in different ways was a strength in this cross-sectional study comparing Native American and non-Native American college students hope perception in the nursing program, albeit no significant differences in hope perception were noticed in the thematic analysis of the two student groups (Charbonneau-Dahlen, 2015). Participant size and geographic limitations in the study correspond with many other scholarly studies related to the Native American college student experience. Furthermore, the study was limited to an undergraduate nursing program to

collect data on instilled hope to enhance student success. These limitations provided justification for additional research studies to capture larger participant sizes, various degree programs, and increased tribal affiliations.

The Dream Catcher and Medicine Wheel were represented in the study by Charbonneau-Dahlen (2015) to connect hope and retention strategies in the undergraduate nursing program. Ali et al. (2021) recommended symbolic interactionism embedded into research to gain Indigenous understanding and perceptions. The Dream Catcher and Medicine Wheel are symbolic to the Native American culture and identity and align with Sociocultural Learning theory concepts. These sociocultural concepts deem cross-cultural and individual differences important to learning (Kimmons & Caskurlu, 2020).

Limitations on tribal affiliation sample size were also demonstrated by Chee et al. (2019), who conducted a quantitative research study to examine Native American self-beliefs, cultural congruity, and ethnic identity on perceived academic stress at a southwestern university. The Navajo tribe represented 82 of the 158 participants in the survey that collected information on a Likert scale for self-beliefs, self-esteem, self-efficacy, identity, public regard, and academic stress (Chee et al., 2019). Self-belief or personal value is regarded as a strong relation to academic persistence (Howard et al., 2021). Chee et al. (2019) found in their study using multiple regression that cultural public regard was the highest contribution to Native American college student's academic stress. Windchief and Brown (2017) attributed higher college persistence rates to institutions that valued student's individual cultures. The study by Chee et al. (2019) had larger Native American college student participation compared to other related studies in the literature but was limited to just one university in the southwest region. Interviewing Native American college students across the US in various higher education

institutions would have increased the validity of the academic stress variables questioned in the study. The study was also limited by research variables on faculty support and the relationship to the Native American college students' academic stress.

Tinto (1993) discussed college student incongruence as the feeling of not belonging which may result in higher dropouts. The concept of incongruence relates to the Social Integration Model and the importance of a culturally supportive higher educational institution on a student's sense of belonging. Chee et al. (2019) found that cultural congruity helped academic confidence and lowered potential academic stress. Academic stress has been linked to lower academic performance and learning capacity (Pascoe et al., 2019).

Brazill et al. (2023) found that cultural congruity and academic confidence are positively impacted when institutions provide a culturally supportive environment for Native American graduate students. These findings helped fill the research gap demonstrated by Chee et al. (2019) on the impacts culturally supportive faculty may have on Native American college students' academic confidence. Brazill et al. (2023) performed a survey to 44 Native American STEM graduate students from twelve doctoral granting higher education institutions in the western and midwestern areas of the US. Consistent with much of the related literature, the sample size was limited in the study and the researchers had to conduct a power analysis to determine if the sample size was significant enough to run statistical analyses on. Outcome variables measured in the analysis were cultural congruity and academic confidence, while peer interactions, mentor cultural support, and university fit were predictor variables (Brazill et al., 2023). The findings also determined that peer interactions positively impacted the Native American graduate student's cultural congruity (Brazill et al., 2023). The research suggested that faculty and staff that value, care and respect Native American students and their culture created a campus climate

of belongingness. Although the power analysis determined the sample size was large enough to answer the research questions by Brazill et al. (2023), Kang (2021) stated that larger sample sizes in research provide more accurate estimates and findings. Increasing the Native American graduate student sample size may have increased the accuracy of the findings and offered additional recommendations for Native American graduate cultural support. Furthermore, including undergraduate students from other majors and additional higher education institutions could increase the generalization validity of the research findings.

The importance of positive peer and institutional interactions in a Native American college student's experience demonstrates the alignment to Sociocultural Learning Theory and the Social Integration Model concepts. Comparatively, social relationships help construct new knowledge and emphasize the value of collaboration over competition according to Indigenous worldviews on learning (Rosado-May et al., 2020). The findings from Brazill et al. (2023) on culturally supportive institutions added with Indigenous worldviews suggest that impactful faculty support models can positively impact Native American college students through collaborative projects, personalized learning, and caring feedback. Caring faculty is a priority for student success (Miller & Mills, 2019).

### **Faculty Support Models in Tribal Higher Education Institutions**

The US Department of Education (2021) describes tribal colleges and universities (TCUs) as higher education institutions that incorporate Native American cultural traditions in their education programs and academic support services. TCUs are important higher education institutions for Native Americans because they tend to be closer in proximity to tribal communities and reservations, removing the traveling distance barrier (Faircloth, 2021). Ward et al. (2014) conducted a study at Chief Dull Knife, a tribal college located in Montana, to

understand their academic support models. The exploratory, qualitative research study conducted at the Chief Dull Knife tribal college determined that mentoring strategies and culturally responsive curriculum employed by native and non-native faculty members improved Native American college student's academic performance, course retention, math and science confidence, and four-year degree pursuit (Ward et al., 2014). This research study interviewed 51 Native American college students for 12 years at Chief Dull Knife College, and data was analyzed through thematic coding. The study demonstrated strengths using a longitudinal study to capture robust qualitative information on the value of a faculty mentor in the sciences and mathematics college fields. The central focus on science, technology, engineering, and math (STEM) courses created a limited variable representation in higher education institutions and justified additional research encompassing all majors.

The culturally responsive curriculum and mentoring strategies that positively impacted Native American college students at Chief Dull Knife College (Ward et al., 2014) aligns with the Sociocultural Learning Theory as an established theoretical framework. Vygotsky formed the internalization principle in the Sociocultural Learning Theory that stated individuals gradually develop psychological functions based on social interactions within their culture, which impact higher mental functioning (Cong-Lem, 2022). Howard (2021) described culturally responsive pedagogy as a shift from the Westernized methodical teaching paradigm to a teaching framework that recognizes a student's cultural background as an important aspect of nurturing a student academically, emotionally, and psychologically. Additionally, the Social Integration Model framework finds alignment in the study because the mentoring support impacted student outcomes. Mishra (2020) found that social support for underrepresented or minority students in college was a key factor in their success.

The research at Chief Dull Knife College provided insights into academic support programming models at tribal colleges and their strengths in serving Native American college students. Further research on tribal college and university academic support models for Native American college students was determined by a qualitative literature review for influences on their persistence and graduation. Keith et al. (2016) used a conceptual framework to direct an appreciative inquiry and research review of 21 search terms to answer positive influences on Native American college persistence. Recommendations from the qualitative review suggested that academic support services by higher education institutions had a considerable influence on Native American academic success. Personalized advising approaches used in tribal college models to help students belong and institutional programming that increased Native American college students' self-efficacy were persistent in the literature (Keith et al., 2016). Self-efficacy is an important emotional intelligence skill for college students to practice as the educational transition and journey can add additional stressors to a student's life (Morales-Rodríguez & Pérez-Mármol, 2019). The research demonstrated strength in using an appreciative inquiry lens to gather data to help determine institutional attributes that positively impacted Native American college students' enrollment, persistence, and graduation. However, the research did not provide quantitative insights on which academic or faculty support models or attributes were valuable to Native American college students' academic experiences, furthering the need for additional research to fill a gap in the existing literature.

Keith et al. (2016) found that personalized academic advising approaches increased self-efficacy. These personalized advising approaches connect to the Sociocultural Learning Theory and the Social Integration Model because personalized faculty and peer support in the learning environment correlates to a student's cognitive growth and commitment to persist in that

learning (Abdul-Rahaman et al., 2023; Zhou & Brown, 2017). Social engagement through a relational perspective helps foster an inclusive learning environment for college students (Bowden et al., 2019). This suggests that genuine, caring social interactions in the learning environment increase student's sense of belonging and their commitment to that institution.

Tiospaye means extended family in the Lakota tribal language (Kerk & Kellogg, 2014). The previous research study on Native American college students persisting to graduation because of tribal community benefits provides a visual into how Tiospaye impacts this student population's academic experience. Expanding on the Tiospaye concept, Lundberg and Lowe (2016) researched faculty interactions, feedback, and academic advising for predictors of Native American college student learning. There were 647 Native American responses collected from the 2007 National Survey of Student Engagement Survey (NSSE) to conduct a multiple linear regression on Native American college students' general education learning gains influenced by faculty (Lundberg & Lowe, 2016). The findings from this research study strongly correlated Native American students' gains in learning in general education coursework to frequent faculty feedback and quality academic advising (Lundberg & Lowe, 2016) and utilized quantitative data to conclude these findings for a valid addition to the scholarship. These findings relate to the central research question on higher education institutional academic support from a learning gains perspective but limit correlational insights on faculty support behaviors. Informal or non-classroom faculty-to-student interactions increase students' persistence in higher education (Mosholder et al., 2016).

Vygotsky's Zone of Proximal Development (ZPD) principle from the Sociocultural Learning Theory is demonstrated by Lundberg and Lowe (2016), who found Native American students gained learning because of a correlation to frequent faculty interactions and feedback.

The research corroborates with the ZPD scaffolding principle as the frequent feedback from instructors helps students build knowledge gradually from a more knowledgeable person (Silalahi, 2019). The concept of feedforward feedback may have connections to scaffolded faculty and peer feedback because it invites collaborative learning interactions with their faculty and academic social systems. Feedforward feedback leads students through a transformational learning practice where they can apply their learnings in new situations (Conrad & Lundberg, 2022).

Many research studies regarding Native American college student faculty and staff interactions and their impacts on their educational journey favored qualitative approaches in the current existing literature (Rodriguez & Mallinckrodt, 2021). Chelberg and Bosman (2020) approached a student mentoring program on Native American self-efficacy using a quantitative approach. Twenty-five Native American students from a Midwest tribal college participated in the study to help answer the research question on mentoring programs increasing a student's self-efficacy. Increased self-efficacy for college students has been linked to student engagement and persistence rates because it determines how a student can cope with stressful situations (Freire et al., 2020). T-testing was used to analyze the data and to find the aggregate mentoring goals on the students' efficacy (Chelberg & Bosman, 2020). The findings from the research demonstrated an increase in Native American college students' self-confidence due to the mentoring program initiated at the tribal college (Chelberg & Bosman, 2020). The quantitative approach and pre- and post-survey data collection were strengths in this research. However, the data was limited on information regarding the emotional support impact of the mentoring program on Native American college students' educational experience and used a small sample size at one Midwest tribal college. This limited information and smaller sample size from the study provided

additional justification to fill in the research gaps on the relationship of perceived faculty support behaviors in the classroom on Native American college degree completions.

Contemporary educational mentoring is defined as professional and psychosocially supportive for mentor and mentee (Mullen & Klimaitis, 2021). The psychosocial support through the mentoring program from the study found that the Native American college student's academic confidence was increased (Chelberg & Bosman, 2020). This demonstrates a connection to the Sociocultural Learning Theory and Social Integration Model theoretical frameworks because of the socialization principle that enhances a learner's cognitive and emotional growth stated in both theories. Faculty and mentors who interact with students inside and outside the classroom through a psychologically safe relationship help students thrive in the college setting (Schreiner et al., 2020). These psychologically safe interactions and connections with faculty may help Native American students persist in their higher education institutions and relate to the Social Integration Model.

Tribal colleges and universities (TCU) continued their efforts in supporting Native American college students using Indigenous worldviews and knowledge to direct student success within their institutions (American Indian College Fund, 2019). A five-year study using a mixed methods approach was conducted to answer how TCUs were doing in terms of best practices for Indigenous internationalization (Sumida Huaman et al., 2019). Internationalization in education refers to shifting educational systems to better support the 21<sup>st</sup> century learner and sustain inclusive educational practices (Engel, 2019). Sumida Huaman et al. (2019) included five TCU site visits in their study and found through a thematic analysis of 108 semi-formal interviews and participant observations that students found their academic experience supportive because of place-based educational views, reciprocal interactions with faculty and relationality to the earth

and community. These three themes determined that knowledge acquisition is not an individual gain but one of community sharing and transformation (Sumida Huaman et al., 2019). The study provided insightful data suggesting the need to adapt pedagogical approaches and faculty support models to be more culturally responsive to support Native American college students. The small sample size of participants in only five TCUs demonstrated a few limitations in the study.

Although the study determined that faculty who interact with students and care for them from a community-based lens help students thrive in the TCU, a lack of quantitative insights on the correlational value of these faculty interactions demonstrated justifications for additional research.

The culturally responsive pedagogy that Native American college students felt supported their academic experience determined through the study by Sumida Huaman et al. (2019) shows alignment to this study's Sociocultural Learning Theory and Social Integration Model theoretical frameworks. Sociocultural Learning Theory encompasses sociocultural factors as influences on human cognitive development (Lai, 2023). Sumida Huaman et al. (2019) stated that student to faculty interaction reciprocity is one of the key factors in Native American tribal college student success. This reciprocity connects to relationality theorized in the Social Integration Model. Relationality is an Indigenous worldview that states humans are interdependent with other beings for physical, intellectual, and emotional health (Elliott-Groves et al., 2020).

### **Summary**

The scarce research on Native American college students and strategies used to impart a positive and successful academic experience is the starting point for the research gaps. There were only 22 articles that met the appreciative inquiry research lens, theoretical framework, and research question alignment in this literature review, furthering the justification for research

expansion in the literature. The appreciative inquiry research lens will continue into this study because it provides the perspective on how humans function when their strengths, values, and successes are noticed to enhance future changes (Davis & Museus, 2019). Along with the appreciative inquiry lens, Vygotsky's Sociocultural Learning Theory and Tinto's Social Integration Model are the established theoretical frameworks to ground this literature review and study.

The Sociocultural Learning Theory and Social Integration Model theoretical frameworks offer alignment with Indigenous worldviews and knowledge because cultural identity, traditions, and norms are important to a human's perception and expression of learning. Social connectedness, elder wisdom, and relationality are cornerstones of Indigenous worldviews (Sumida Huaman & Abeita, 2018). Additionally, the Two-Eyed Seeing approach is used in this literature review and study to provide multi-perspective recommendations and future research on Native American college students. Wright et al. (2019) described the Two-Eyed Seeing approach when Western and Indigenous knowledge frameworks are aligned in the research to better understand and answer questions. This approach ensures that research that focuses on Native Americans and Indigenous peoples is respectful, reciprocal, responsible, and relevant (Peltier, 2019).

The lack of research on Native American college students is the basis for this study, but additional consistencies were found in the scholarly research which demonstrated favoring qualitative approaches with a thematic analysis for data collection. Qualitative research approaches have the advantage of using a participant's perceived experiences and control over the types of questioning by the researcher (Creswell & Creswell, 2018). These perceptions are important to provide a voice to Native American college students' lived experiences. The

qualitative research approach can provide limitations to the research. Creswell and Creswell (2018) discussed that researcher presence may cause biased responses from the participants and difficulties in interpreting their responses may hinder valid data analysis. This research study will use a quantitative approach to help add to the limited research that favored qualitative approaches.

Furthermore, the related literature review provided additional gaps that justified the research focus on determining the relationship between perceived faculty support behaviors in the classroom on the Native American student's college degree completion experience. Many research studies reviewed in the literature focused on specific demographics. These studies centralized their data collection and analysis at higher education institutions with small sample sizes, like community colleges or four-year public institutions. Large tribal affiliation research was underrepresented in the literature. The existing research often focused on one tribe geographically located near the institution, a specific program, or a support model. This research study will use a dataset with responses from 344 Native American college degree holders who earned those degrees between 1999 to 2016 from colleges across the US. This increased demographic and geographic sample size may provide a more robust analysis of the correlation between perceived instructor support behaviors and the Native American college degree completion experience.

The literature review on Native American college students and their faculty interactions and support showed a consistent theme that these interactions have a positive impact on the academic experience. No current studies in the scholarship quantitatively determine the relationship between perceived levels of faculty support behaviors in the classroom for various degrees earned, diverse higher education institutions, and numerous tribal affiliations on the

Native American college student degree completion experience. This study will fill this research gap by potentially answering the research questions on the relationship between faculty's perceived supportive classroom behaviors on Native American college students' self-reported persistence to graduation. This data will be analyzed using a larger sample size of self-identified Native American college degree holders. The findings, recommendations and implications from this study may assist higher education institutions in their advancement of inclusive and equitable academic practices for Native American college students.

## **CHAPTER THREE: METHODS**

### **Overview**

The purpose of this quantitative study is to test the relationship between faculty's perceived supportive classroom behaviors and the Native American student's college degree completion experience. The literature review substantiated the need for additional research on Native American college students' academic successes influenced by support behaviors and instructional practices by faculty in higher education institutions. The current scholarship was limited on Native American college students' participant sizes in many of the quantitative studies. This study will add to the scholarship scarcity on Native American college students and institutional strategies that impact their college experience through secondary data provided by the Bill and Melinda Gates Foundation's (2021) 2018 Gates Millennium Scholars (GMS) Survey made publicly available by the Inter-university Consortium for Political and Social Research (ICPSR). The data for this study provides a large participant size of 344 nationwide Gates Millennium Scholar program recipients and finalists who identified as Native American and received their college degrees between 1999 to 2016. Higher education institutions may find the insights and recommendations from this quantitative study beneficial for expanding access and equity for Native American college students and other underrepresented student communities. This chapter provides information on the research design, research questions, hypotheses, setting, participants, instrumentation, procedures, and data analysis plan for the study.

### **Research Design**

The study on the relationship between faculty's perceived supportive classroom behaviors and Native American college student degree completion persistence used a quantitative research approach with an explanatory correlational research design. The current

literature centered on qualitative, exploratory research methods to gather information on Native American higher education academic success. Qualitative research demonstrates strengths by finding themes and deductively analyzing the data to make meaning of the perceptions provided by participants (Creswell & Creswell, 2018). According to Beuving and de Vries (2015), qualitative research approaches tend to use naturalistic inquiry to understand societal perspectives and phenomena. Understanding different cultures within society explains why the reviewed literature favors the qualitative approach. Quantitative research approaches oftentimes use a post-positivist lens to evolve current knowledge in the scholarship (Mehrad et al., 2019). A quantitative research design was chosen for this study to expand and evolve the current literature's qualitative findings on the Native American college student experience. Creswell (2012) described quantitative research approaches with a nonexperimental correlational research design as best for measuring and explaining the relationship between two or more variables. Additionally, correlational research designs analyze and interpret statistical findings by treating participants as a single group to determine the strengths between the variables (Creswell, 2012). Correlational research designs have an advantage because they provide researchers with robust information on the direction, degree, and strength of the relationship between the variables being investigated (Seeram, 2019). This correlational research design advantage may help to further explain the relationship between faculty's perceived supportive classroom behaviors and Native American college students' self-reported persistence to graduation.

This explanatory correlational research study used cross-sectional data from the Gates Millennium Scholar Survey conducted in 2018 to provide numerical information on the college experience self-reported perceptions by Native American college graduates to determine the relationship between faculty's supportive classroom behaviors and Native American college

student degree completion persistence. Longitudinal quantitative studies collect data over time, whereas cross-sectional data collection occurs at a set point in time (Kim, 2019). A survey method is the preferred data collection approach for this study because it provided initial correlational data from self-reported perceptions by Native American college students from 1999 to 2017 who were awarded or were finalists in the Gates Millennium Scholars program. Thomas (2023) stated cross-sectional survey data and its correlational findings can provide future longitudinal studies with a reliable starting point to further investigate the correlations.

Correlational research designs can include scatterplots for displaying variable scoring, associations between those scores, and variable analyses (Creswell, 2012). A common correlational analysis is the Pearson correlation coefficient because it provides quantitative insights into the relationship between two independent variables (Creswell, 2012; Temizhan et al., 2022). However, the Spearman's rank correlation analysis was most appropriate for answering the research questions on the relationship between faculty's perceived supportive classroom behaviors and Native American college student degree completion persistence because it can explain variability ranks, like self-reported perceptions on a Likert scale (Temizhan et al., 2022). The purpose of this study is to objectively determine the relationship between faculty's perceived supportive classroom behaviors and Native American college student degree completion persistence. The independent variable described how Native American college graduates self-reported their perceptions of faculty supportive behaviors in the classroom on a 5-point Likert scale. Using this independent variable in a correlational study may provide valuable information for various higher education institutions on how faculty practices and instructional frameworks can influence the Native American college student experience.

### **Research Question**

According to Fandino (2019), good research questions are feasible, interesting, novel, ethical, and relevant. This study's research questions were formed using the FINER framework. Gates Millennium Scholar program recipients and finalists are recognized as an interest in this correlational research study because this scholarship program was provided for academically strong, underrepresented student groups that may have had a financial barrier to pursuing their college education (GMSP, n.d.). Native American students made up a portion of these underrepresented scholars. Based on the review of related literature that showed limited research on the relationship between faculty's perceived supportive classroom behaviors and Native American college student degree completion persistence, the following correlational research questions were determined.

**RQ1:** What is the relationship between faculty's perceived supportive classroom behaviors and undergraduate Native American college students' self-reported persistence to graduation?

**RQ2:** What is the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation?

### **Hypotheses**

Quantitative research hypotheses are defined as expected outcome predictions based on the research variables (Creswell & Creswell, 2018). The following null ( $H_0$ ) and alternative ( $H_a$ ) hypotheses are identified to statistically test, measure, and provide insights into the research questions.

**H<sub>01</sub>:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test.

**H<sub>a1</sub>:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test.

**H<sub>02</sub>:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test.

**H<sub>a2</sub>:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test.

### **Setting and Participants**

The dataset selected for this study was collected by the 2018 Gates Millennium Scholars (GMS) Survey made publicly available by the Inter-university Consortium for Political and Social Research (ICPSR) from the Bill and Melinda Gates Foundation (BMGF) (2021). The BMGF GMS Survey (2021) collected responses from GMS recipients who earned the award or became a finalist in the last year of their high school career between 2000 to 2013. The BMGF (2021) emailed 21,393 surveys and received a total response rate of 12%. The GMS survey included 97.1% responses from scholarship recipients or finalists who identified as a minority (BMGF, 2021). The responses from 344 Native American (American Indian) GMS recipients or finalists who completed their college degrees were used in this correlational analysis as defined in this study's purpose.

### **Setting**

The setting for this study was Gates Millennium Scholar recipients and finalists attending accredited US colleges or universities for any undergraduate programs. Graduate programs in

computer science, education, engineering, library, math, public health, or general science from accredited US colleges and universities are also included in this study's setting (BMGF, 2021). Accredited colleges and universities in the US include two- and four-year public, private, and minority supported institutions (MSI). According to the Council for Higher Education Accreditation (n.d.), accredited higher education institutions are rigorously reviewed for quality in their educational offerings.

### **Participants**

Participants in this study were drawn from a secondary dataset made publicly available by the Inter-university Consortium for Political and Social Research (ICPSR) from the Bill and Melinda Gates Foundation (BMGF, 2021). The sample for the study is 344 Native American (American Indian) GMS recipients or finalists who completed their college degrees. Degrees obtained by the participants from this survey include undergraduate and graduate. The research questions investigated the relationship between faculty's perceived supportive classroom behaviors and Native American college student degree completion persistence for the GMS program recipients or finalists. Participants were limited to those who identify as Native American (American Indian) only. The participants for this study included 344 self-identified Native American GMS program recipients or finalists. BMGF (2021) stated that the GMS survey respondents were full time college students in a university or college who demonstrated a 3.3 or higher GPA on a 4-point scale, were Pell grant eligible, and were outstanding in community service.

Samples are used in research studies to provide the scholarship with generalized conclusions on the research population (Andrade, 2020). According to Uttley (2019), significant or effect size in research studies ensures appropriate sample population sizes are used to allow

for replication and future studies. This study used Slovin's formula (see Appendix A) to calculate the minimum sample size for a reliable research study. Slovin's formula helps researchers describe generalizations on the study's population using inferential statistics (Ismail et al., 2022). A 95% confidence level, a 5% margin of error, and a 32.5% population proportion were used to determine the minimum number of participants for reliable statistical conclusions. The 32.5% population proportion was derived from 20% of Native American students earning a bachelor's degree or higher, 12% earning an associate degree (Postsecondary National Policy Institute, 2021), and 0.5% earning a post-graduate degree (NCES, 2020). The population of 344 is the total number of GMS program recipients and finalists who identified as Native American collected by the web-based survey by BMGF (2021) and was used to determine if the population size for statistical conclusions is reliable. The statistical computation was conducted to determine if the sample size for the study is reliable and can be replicated in future studies.

### **Instrumentation**

The instrument that was used in this correlational research study is the Gates Millenium Scholar Survey, distributed for public use by the Inter-university Consortium for Political and Social Research (ICPSR) data repository. BMGF (2021) conducted the GMS cross-sectional survey from February 7, 2018, to March 5, 2018, to collect data on GMS recipients and finalists to analyze higher education impacts on underrepresented student communities in the US. The participant sample in this study represents 344 self-identified Native American GMS program recipients or finalists from 1999 to 2016.

#### **Gates Millenium Scholar Web Based Survey**

The Gates Millenium Survey was presented in the English language and only surveys students from African American, Asian, American Indian/Alaska Native, Hispanic/Latino, and

Pacific Islander racial backgrounds (BMGF, 2021). This survey was conducted from February 2018 to March 2018 to US GMS program recipients and finalists as self-administered questionnaires to capture individual perspectives through a continuous variable Likert scale (BMGF, 2021). The unit of observation is individual, and the time method represents a cross-sectional data collection for the web-based survey conducted by BMGF (2021). Variables of interest on the GMS survey included race, ethnicity, social, cultural, economic background, college choice, major, financial aid, academic achievements, post-graduation education plans, career choice, and career satisfaction (BMGF, 2021). Gates Millennium Scholar program recipients and finalists who identified as Native American are the dependent variable used for this study (see Appendix B). The independent variable in this correlational study is Native American college graduates' self-reported perceptions of faculty supportive behaviors in the classroom (see Appendix B). All other variables listed on the GMS survey have been excluded because they do not meet the parameters of this study.

### ***Validity and Reliability***

The related professional literature on Native American college students' perception of their college journey also uses web surveys as a research instrumentation tool. Lundberg and Lowe (2016) researched faculty interactions, feedback, and academic advising for predictors of Native American college student learning from the 2007 National Survey of Student Engagement Survey (NSSE). Brazill et al. (2023) performed a survey to Native American STEM graduate students to answer their central research question. Mosholder et al. (2016) conducted a Likert scale survey for their mixed methods approach in their research on campus culture and its impacts on Native American college student belongingness. Furthermore, several higher education institutions use self-administered web-based surveys to measure their student's perceptions of

their institution and experience. BMGF (2021) stated that its GMS Survey is reliable and valid because survey responses were weighted to reflect accurate self-administered perception estimates in proportion to the underrepresented population groups represented in the GMS program. Creswell (2012) discussed post survey interviews with respondents to collect information on their survey experience to increase research reliability. Similar college student and higher education alumni studies using a Likert-scaled web survey as the research instrumentation tool provided support for construct validity for its use in this study because the variable measured perceptions of faculty supportive behaviors in the classroom to Native American college students' persistence to graduation assesses similar perception constructs.

### ***Internal Consistency***

Additionally, the internal consistency of a survey in research can be measured using reliability statistics (Creswell & Creswell, 2018). Creswell and Creswell (2018) recommended Cronbach's alpha to measure the internal consistency of a continuous variable Likert scale survey. Reliability consistency in surveys ranges between 0.7 to 0.9 (Creswell & Creswell, 2018). Cronbach's alpha formula was used to report internal consistency for this study (see Figure C1, Appendix C). This study used two questions from the GMS survey for this study's independent variable (BMGF, 2021) (see Appendix B), which was conducted on a 5-point subscale, where GMS program recipients and finalists could respond from strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1).

### ***Permissions***

This study used secondary data from the 2018 Gates Millennium Scholar Survey distributed for public use by the Inter-university Consortium for Political and Social Research (ICPSR) (BMGF, 2021). This web survey instrument was conducted by the BMGF, therefore

secondary research instrumentation permission is not applicable for this study. However, secondary data researchers should acknowledge original research data collectors and investigators of their use of the primary data for ethical implications (O'Connor, 2020). Figures D1 and D2 in Appendix D provide a statement from ICPSR on their public use data permissions in scholarly work and an email copy of an ICPSR staff member permitting the use of the publicly available data for secondary data analysis for this study. All work and original data collected by the BMGF (2021) are academically cited within this study. This study and the use of the 2018 GMS survey data are intended for research and statistical purposes only as agreed upon in the ICPSR's Terms of Use disclaimer (see Figure D2, Appendix D).

### **Procedures**

This correlational study used secondary data from the Bill and Melinda Gates Foundation's Gates Millennium Scholar Survey (2021) distributed by the Inter-university Consortium for Political and Social Research, to inform the research questions. Secondary data analysis (SDA) involves using primary data collected from previous research that helps answer or address new research questions (Wickham, 2019). The following section provides a description of the permissions, recruitment, data collection, data analysis, and data synthesis. The use of a pilot study, instrumentation training, interventions, and treatments was excluded from the procedures section because of the exploratory, non-experimental design of the secondary data used in this study.

### **Permissions**

A publicly, available report with primary data from the BMGF (2021) GMS Survey was used in this study to answer the research questions on the relationship between perceptions of faculty supportive behaviors in the classroom and Native American college student's persistence

to graduation. According to the NIH Central Resource for Grants and Funding Information (n.d.), this data was not originally collected for this study, and access is not granted to the human subject identifiers linked to the data. A proposal was conducted to the IRB to determine a waiver to use the data as non-human subject research. This study was granted IRB approval.

### **Recruitment**

Tables 1 and 2 illustrate the participant demographics used from the BMGF (2021) Gates Millennium Scholar survey of 344 respondents who were awarded or were program finalists from 2000 to 2013 and completed college degrees between 1999 to 2016. The original 363 respondents who identified as Native American on the GMS survey were stratified for recruitment in this study as defined by the research and its variables. Stratified probability sampling is used when there is a research characteristic imbalance in the sample population (Creswell, 2012). In this case, any GMS respondent who did not earn a college degree was removed from the data analysis based on the Native American college degree completion dependent variable in this study. Respondents who indicated they earned associate or bachelor's degrees are grouped as undergraduate college students for this study's RQ1 analysis. Respondents who indicated post-graduate on the survey are included in the graduate degree analysis to investigate the RQ2 for this study. Appendix B, Figures B1 and B2 provide Q24 and Q25 as the stratified survey questions from the GMS survey used in this study. The total undergraduate response rate was 157. There were two missing response values for Q24 and Q25. The total graduate degree response rate was 187. All other GMS survey questions were removed from this study.

**Table 1**

*Gates Millenium Scholar (GMS) Participant Demographics (BMGF, 2021) compared to Limited Study Sample Size Demographics for Independent Variable: Q24-My Instructor Cared About Me*

Native American Respondents	Original GMS Participant Respondent Size for (My instructor cared about me)	Limited Participant Respondent Sample Size for Study (Q24-My instructor cared about me)
Some or no college	20	0
Associate degree	12	12
Bachelor's degree	143	143
Postgraduate degree	187	187
Total	n=363	n=342

*\*2 missing survey response values*

**Table 2**

*Gates Millenium Scholar (GMS) Participant Demographics (BMGF, 2021) compared to Limited Study Sample Size Demographics for Independent Variable: Q25-I had at Least One Instructor that Excited Me to Learn*

Native American Respondents	Original GMS Participant Respondent Size for (I had at least one instructor that excited me to learn)	Limited Participant Respondent Sample Size for Study (Q25-I had at least one instructor that excited me to learn)
Some or no college	20	0
Associate degree	12	12
Bachelor's degree	145	145
Postgraduate degree	185	185

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Total	n=363	n=342
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*\*2 missing survey response values*

### **Data Collection**

Upon completion of the review of the related literature, the research problem determined there is a lack of quantitative research on the Native American college student experience. Once the research gap was determined, variables that included faculty or instructor support and instructional practices on the Native American college student experience were analyzed through a publicly available dataset search. Data from the Bill and Melinda Gates Foundation's Gates Millennium Scholar Survey (2021) distributed by the Inter-university Consortium for Political and Social Research met the criteria for the research problem, purpose, and research question.

This report was downloaded from

<https://www.icpsr.umich.edu/web/ICPSR/studies/37665/datadocumentation>. Once the survey data was downloaded, the two educational experience survey questions and college degree holders who identified their race as Native American from the GMS Survey (BMGF, 2021) report were selected for this study's data analysis.

### **Data Analysis**

Creswell and Creswell (2018) recommend an orderly data analysis plan for a clear visual of the research analysis process. This section provides the data analysis plan in a series of steps that were completed for this study. The secondary data provided by BMGF (2021) already performed a response bias analysis. According to BMGF (2021), survey sampling used weighting to help mitigate nonresponse bias. This study will use the Version 29 IBM Statistics Package for the Social Sciences (IBM SPSS Statistics) (IBM, 2014). The Cronbach alpha

formula (see Figure D1, Appendix D) was completed first to check for internal consistency in the survey. Next, the Spearman rank correlation test was conducted once the assumptions had been tested to determine the relationship between the independent variable on the dependent variable using only the definite perceived levels of 4 (agree) and 5 (strongly agree) from the Likert scaled survey responses from the BMGF (2021). Gates Millenium Scholar recipients and finalists who identified as Native American are the dependent variable. The independent variable is perceived faculty supportive behaviors in the classroom. Temizhan et al. (2022) stated that research that uses the Spearman rank correlation test as a statistical analysis assumes that the variables are ordinaly ranked, monotonically related, unbiased in their data ranking, and independently distributed. These assumption tests are validated in the following chapter to ensure that the Spearman rank correlation test was appropriate for this study. Based on the data analysis results, the research discussion provides detailed insights into the data interpretation of the research hypotheses' significant relationship strength between perceived faculty supportive behaviors in the classroom and the Native American college students' self-reported persistence to graduation.

### **Spearman Rank Correlation Test**

The purpose of the inferential hypotheses in this quantitative, correlational study related perceptions of faculty supportive behaviors in the classroom to Native American college students' persistence to graduation. The Spearman rank correlation test was used in this study because there is a ranked-ordinal independent variable to measure the correlation to the dependent variable with nonparametric assumptions (Verma et al., 2019). Nonparametric statistical analyses can be used when the distribution of the data is uncertain or not normal (Kvam et al., 2023). The Spearman rank correlation test calculated inferences drawn from this study's sample to answer the central research questions for the population and supported the

rationale for using this nonparametric statistical test (Creswell & Creswell, 2018). The correlational statistical analysis was calculated using the formula shown in Figure C2 in Appendix C on the SPSS Version 29 analysis software (IBM, 2014).

### ***Assumption Tests***

Prior to performing the Spearman rank correlation analysis on the relationship between perceived faculty supportive behaviors in the classroom and the Native American college students' self-reported persistence to graduation, ordinality and monotonicity assumptions were satisfied to ensure the Spearman rank correlation analysis was appropriate and accurate. Ordinal data denotes a ranked perception or personal feeling toward a survey question being objectively evaluated (Iannario et al., 2018). This study used ordinal data with the Likert scale levels consisting of strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). Monotonic relationships in statistical correlational analyses refer to a non-linear relationship where variable changes can be positive (1) or negative (-1) (van den Heuvel & Zhan, 2022). A zero (0) coefficient signifies a non-monotonic relationship (van den Heuvel & Zhan, 2022). The SPSS was used to perform these satisfied assumptions and displayed through a scatter plot in the analysis to determine whether there was a positive or negative monotonic relationship between the independent variables in this study.

### **Data Synthesis**

Darlington and Hayes (2017) recommended the estimated effect and the  $p$  value to be included in the research findings to clarify the independent variables' statistical significance on the dependent variable for correlational studies. The estimated effect refers to the coefficient (Darlington & Hayes, 2017). The  $p$ -value is used to decide if a rejection of the null hypothesis is warranted in the research and to inform the data with confidence on the research parameters

(Ringland et al., 2021). These results were included in the study's findings. Additionally, all results based on the Spearman rank correlation analysis and its assumptions tests were disclosed in scatterplots, graphs, and tables for a clear representation of the findings.

The data analysis results may show a statistically significant correlation or a null correlation regarding the research question and hypotheses. Creswell and Creswell (2018) stated that ethical research discloses all statistical outcome perspectives. When reporting statistical outcomes in quantitative research, a researcher must also avoid manipulating data to side with their research or participants' needs (Creswell & Creswell, 2018). It is important for professional literature to review all the statistical perspectives associated with the research findings that were shared regarding the relationship between perceived faculty supportive behaviors in the classroom and the Native American college students' self-reported persistence to graduation. The null findings will still add to the professional literature and may assist future research directions to help lessen the research dearth on Native American college students' experiences.

### **Summary**

This chapter discusses the quantitative, correlational research design to answer the research question on the relationship between perceived faculty supportive behaviors in the classroom and the Native American college students' self-reported persistence to graduation. Secondary data from the Bill and Melinda Gates Foundation's Millenium Scholar Survey (2021), distributed by the Inter-university Consortium for Political and Social Research was used to test the study's hypotheses through a correlational analysis. The Spearman rank correlation test was performed to determine if there was a significant relationship or no relationship at all between the dependent and independent variables. The SPSS analysis software program was used for this study's Spearman correlational analysis and assumption tests. The estimated effect and the  $p$

value data synthesis were also conducted on the SPSS analysis software program. Creswell and Creswell (2018) also stated that researchers working with indigenous participant data must respect their culture and norms. This research study has maintained cultural sensitivity and respect when reporting the findings. These findings may help expand the research on the Native American college student experience and inform higher education institutions of faculty and staff support models that advance equitable learning.

## CHAPTER FOUR: FINDINGS

### Overview

This chapter will provide the research questions, null and alternative hypotheses, data analysis, and findings using secondary data from the Bill and Melinda Gates Foundation's (BMFG) Gates Millennium Scholar Survey (2021). Tables, scatterplots, and figures are used in this chapter for visual representation of the Spearman rank correlation data analysis and findings. The current research favored qualitative methodologies to inform the scholarship on faculty support practices and models that positively influenced Native American college students' degree persistence. Additionally, the current scholarship conducted research for specific demographics, like degree levels, tribal affiliations, geographical locations, and institutions. The purpose of this quantitative study is to test the relationship between faculty's perceived supportive classroom behaviors and the Native American student's college degree completion experience. The secondary data used in this study included various degree levels, tribal affiliations, geographical locations, and higher education institutions. The findings from this study will expand the scholarship on the Native American college student experience and may inform decision-makers in higher education institutions on instructional support practices to elevate Native American college student's persistence to graduation.

### Research Questions

**RQ1:** What is the relationship between faculty's perceived supportive classroom behaviors and undergraduate Native American college students' self-reported persistence to graduation?

**RQ2:** What is the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation?

## Hypotheses

**H<sub>0</sub>1:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test.

**H<sub>a</sub>1:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test.

**H<sub>0</sub>2:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test.

**H<sub>a</sub>2:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test.

## Descriptive Statistics

Descriptive statistics are used in this study to describe the general data patterns and trends computed by statistical procedures (Cooksey, 2020). Tables and graphs are provided alongside the data analysis overview to help simplify the identification of data patterns and trends. The Spearman rank correlation statistical analysis was computed on the SPSS Version 29 using secondary data from the Bill and Melinda Gates Foundation's (BMGF) Gates Millennium Scholar Survey (2021). This secondary data was stratified to include 344 Native American college students who earned an associate's degree or higher between 1999 to 2016. Figures 1 and 2 from Appendix B provide the participant responses on their perceived faculty support behaviors from the Gates Millennium Scholar Survey conducted in 2018 (BMGF, 2021). Table 3 provides an

additional summary of the Likert-scaled responses from 344 Native American college students with undergraduate and graduate degrees. Each survey question showed two missing response values.

**Table 3**

*Participant Response Summary for Likert Scaled Survey Questions for Faculty Support*

*Behaviors*

<i>Scaled Response</i>	<i>My Instructor Cared About Me</i>	<i>I Had at Least One Instructor that Excited Me to Learn</i>
	<i>Undergraduate</i>	
Strongly Disagree	5	3
Disagree	16	5
Neutral	29	7
Agree	49	22
Strongly Agree	56	120
		<b>n=157</b>
	<i>Graduate/Postgraduate</i>	
Strongly Disagree	6	0
Disagree	12	4
Neutral	34	6
Agree	51	22
Strong Agree	84	153
		<b>n=187</b>
<i>Total</i>	<i>n=344</i>	

*Note. Survey summary from Gates Millenium Scholar Survey (BMGF, 2021).*

### Internal Consistency Test

Cronbach's alpha was first measured to ensure the internal consistency of the Likert scale survey was reliable. Creswell and Creswell (2018) stated that internal consistency that is between 0 and +1 demonstrates reliable survey data. The closer the value to +1, the more reliable the data is (Creswell & Creswell, 2018). Reliability in quantitative studies is important for the consistent use of similar data instruments over time (Sürücü & Maslakçı, 2020). Figure C1 in Appendix C provides the statistical equation calculated by SPSS Version 29 for Cronbach's alpha. The survey data used in this study had an internal consistency of 0.839, as shown in Table 4. The survey consists of a 98.8% response validity. There are missing survey responses from four respondents, which did not harm the survey's validity. Based on the statistical output from Cronbach's alpha calculation, this data is determined to have a positive internal consistency.

**Table 4**

*Cronbach's alpha for Internal Consistency*

<b>Cronbach's alpha</b>	<b>Responses</b>	<b>Valid Responses</b>	<b>Survey Responses Measured</b>	<b>% of Response Validity</b>	<b>Internal Consistency Strength</b>
.839	344	340	2	98.8%	Strong

*Note. Cronbach alpha results from SPSS 29 determined that this study's data has strong validity (Gates Millenium Scholar Survey Responses/BMGF, 2021)*

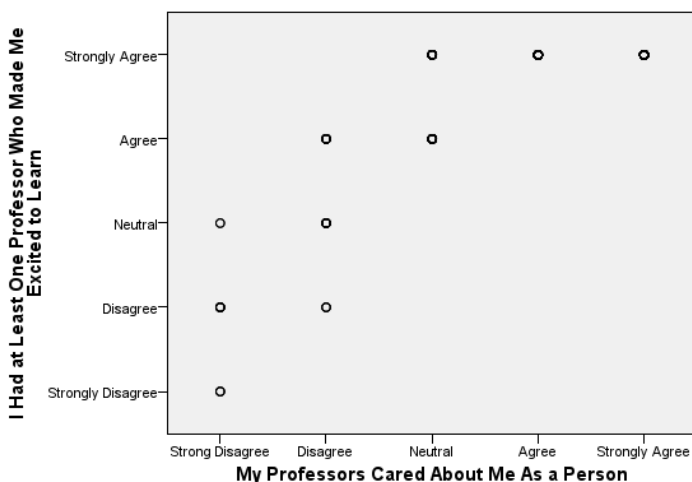
### Assumption Tests

Assumption tests must be met in correlational analyses for the research findings to be valid and accurate (Verma & Abdel-Salam, 2019). The Spearman correlation rank test is nonparametric. Nonparametric statistical tests do not require normal distribution when analyzing and measuring the relationship of the data (Polti et al., 2021). The assumption tests were

performed in SPSS Version 29 to ensure the Spearman rank correlation test is most appropriate for this study that measures the relationship between perceived faculty supportive behaviors on the Native American college student degree persistence. The first assumption test is met because both faculty supportive variables are measured on an ordinal 5-point Likert scale. Polti et al. (2021) stated that nonparametric tests are best for ordinally ranked data. Figure 4 shows the ordinally ranked variables on a simple scatterplot.

#### Figure 4

##### *Ordinally Ranked Variables Assumption Test*



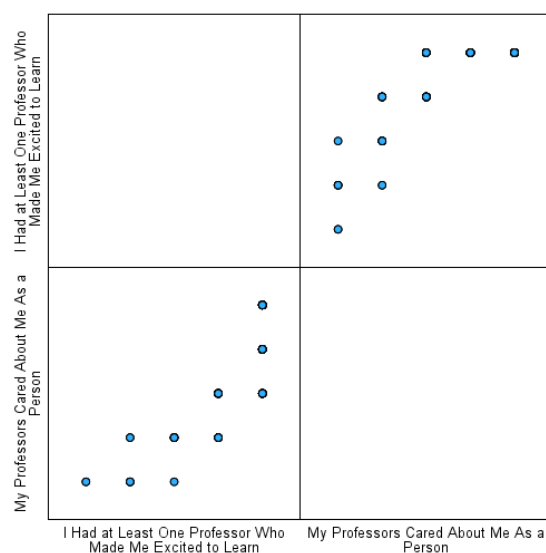
*Note. A simple scatterplot from SPSS 29 showing a curvilinear relationship between the ordinally ranked faculty support behavior variables (Gates Millenium Scholar Survey Responses/BMGF, 2021)*

The second assumption test is met, as illustrated in Figure 5. The matrix scatterplot (Figure 5) demonstrates a positive monotonic relationship. Monotonic relationships in correlational analyses find that as one variable moves in a certain direction, the other variable tends to follow in that same direction (Kumar & Reddi, 2023). Figure 5 shows a positive relationship between the independent variables in this study because both variables move in an

upward direction together. The variable relationship direction does not always demonstrate linearity. Figure 5 also shows that there is curvilinearity in this study's variable relationship. The Spearman rank correlation test is determined to be the most appropriate to measure the relationship between the faculty's supportive behaviors on the Native American college students' degree persistence.

**Figure 5**

*Monotonic Relationship Assumption Test*



*Note. A matrix scatterplot from SPSS 29 showing a positive monotonic curvilinear relationship between the faculty supportive behaviors (Gates Millenium Scholar Survey Responses/BMGF, 2021)*

### **Inferential Statistics**

Inferential statistical tests are used in research to answer the defined hypotheses (Creswell & Creswell, 2018). The assumption tests calculated in SPSS 29 determined that the Spearman rank correlation test is most appropriate for examining the relationship of perceived faculty support behaviors on Native American college degree persistence. This inferential

statistical test helped determine the relationship and its correlational significance on the dependent variable to examine whether the null and alternative hypotheses were accepted or rejected (Creswell & Creswell, 2018). A null hypothesis predicts that no relationship or significance occurs between the variables, whereas the alternative hypothesis predicts a potential outcome or direction based on similar research studies (Creswell & Creswell, 2018).

The Spearman rank correlation test was performed in SPSS 29 using the nonparametric bivariate correlation analysis function to calculate the correlation direction and significance on strongly agree (5) and agree (4) survey responses. Calculating these two survey responses for this study's faculty-supportive behavior construct helps to mitigate common method bias. Common method bias in self-administered surveys occurs when inferential tests overestimate or underestimate variable relationships because response parameters are outside the research construct (Kock et al., 2021). Based on the parameters of this study, it is determined that excluding the strongly disagree (1), disagree (2), and neutral (3) ordinal ranked data from the Spearman rank correlation test was more informative for rejecting or accepting the null hypotheses. Tanujaya et al. (2022) stated that neutral responses on a Likert-scaled survey might indicate perceived indifference to the question. Table 4 provides a visual of the survey response stratification to mitigate common method bias to determine a more informed correlation between the variables.

**Table 5**

*Participant Response Summary for Likert Scaled Strongly Agree (5) and Agree (4) Survey Questions for Faculty Support Behaviors*

<i>Scaled Response</i>	<i>My Instructor Cared About Me</i>	<i>I Had at Least One Instructor that Excited Me to Learn</i>
<i>Undergraduate</i>		
Agree	49	22
Strongly Agree	56	120
<i>Graduate/Postgraduate</i>		
Agree	51	22
Strong Agree	84	153
<i>Total</i>	<i>n=315</i>	<i>*4 missing response values removed</i>

*Note. Stratified Survey summary from Gates Millenium Scholar Survey (BMGF, 2021).*

### **Spearman Rank Correlation Test**

The formula used in SPSS Version 29 to calculate the Spearman rank correlation is shown in Appendix C, Figure C1. The Spearman rank correlation reporting structure is  $r(df) = [r \text{ value}], p \text{ value}$ . The degrees of freedom (df) refer to the datapoint availability for estimating statistical modeling (Rodgers, 2019). The degrees of freedom (df) are calculated as  $n-2$ .

Statistical significance testing is represented by the  $p$  value. Creswell and Creswell (2018) described the statistical significance testing to remove the chance effect on the results. SPSS 29 determines the statistical significance testing for Spearman rank correlation with a two-tailed alpha value of .01. The estimated effect or correlation coefficient in the Spearman rank correlation test interprets the absolute value of  $r_s$  from .00 to .19 as very weak, .20 to .39 as weak, .40 to .59 as moderate, .60 to .79 as strong, and .80 to 1.0 as very strong (Kumar & Reddi, 2023).

A Spearman's rank correlation was run to determine the relationship between faculty support behaviors on 140 Native American college students with undergraduate degrees who responded to perceived levels of faculty support with an agree (4) or strong agree (5). There is a strong, positive correlation between perceived faculty support behaviors on the Native American undergraduate college students' persistence to graduation, which is statistically significant ( $r_s(138) = .617, p < .001$ ). Table 6 represents the SPSS 29 correlation output for this study.

**Table 6**

*Spearman rank correlation test on Native American students with Undergraduate Degrees*

<b>Spearman's rho</b>	<b>Correlation Coefficient</b>	<b><math>p</math> value</b>	<b>Relationship Strength</b>
Faculty Supportive Behaviors	.617*	$p < .001$	Strong
Total	n=140	<i>*Correlation is significant at .01 level (two-tailed alpha)</i>	

*Note. Results of the Spearman Correlation rank test as computed by SPSS 29 (Survey date from*

*BMGF, 2021)*

A Spearman's rank correlation was run to determine the relationship between faculty support behaviors on 175 Native American college students with graduate degrees who responded to perceived levels of faculty support with an agree (4) or strong agree (5). There is a moderately strong, positive correlation between perceived faculty support behaviors on the Native American graduate college students' persistence to graduation, which is statistically significant ( $r_s(173) = .566, p < .001$ ). Table 7 represents the SPSS 29 correlation output for this study.

**Table 7**

*Spearman rank correlation test on Native American students with Graduate Degrees*

<b>Spearman's rho</b>	<b>Correlation Coefficient</b>	<b>p value</b>	<b>Relationship Strength</b>
Faculty Supportive Behaviors	.566*	$p < .001$	Moderately Strong
Total	n=175	<i>*Correlation is significant at .01 level (two-tailed alpha)</i>	

*Note. Results of the Spearman Correlation rank test as computed by SPSS 29 (Survey data from BMGF, 2021)*

## **Results**

### **Hypotheses**

Inferential statistics were able to report whether a hypothesis in this study was rejected or accepted. The first null hypothesis for this study states that there is no significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test. This

hypothesis is rejected based on the results of the inferential statistical test. The estimated effect or coefficient finds a .617 correlation strength. Kumar and Reddi (2023) stated that coefficients between .60 to .79 are strong relationships. The second null hypothesis that states there is no significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test is also rejected. The estimated effect or coefficient finds a .566 correlation strength. Coefficient strengths between .40 and .50 are moderately strong relationships (Kumar & Reddi, 2023). The inferential statistical analysis calculated the two-tailed alpha value at  $p < .001$  for both null hypotheses testing. This determines that there is a .001% or less chance that the null hypotheses are true. Lower bound  $p$  values generate confidence in the evidence against the null hypothesis (Bickel, 2021). Table 8 provides an overview of the null and alternative hypotheses based on the results from the Spearman rank correlation statistical test.

**Table 8**

*Inferential Statistical Results for Hypotheses*

Hypothesis	Description	Statistical Output	Reject or Accept
H <sub>01</sub>	There is no significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test.	$(r_s(138) = .617, p < .001)$	Reject

H <sub>a1</sub>	There is a significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman rank correlation test.	( $r_s(138) = .617$ , $p < .001$ )	Accept
H <sub>02</sub>	There is no significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test.	( $r_s(173) = .566$ , $p < .001$ )	Reject
H <sub>a2</sub>	There is a significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman rank correlation test.	( $r_s(173) = .566$ , $p < .001$ )	Accept

*Note. Hypotheses Results of the Spearman Correlation rank test as computed by SPSS 29*

*(Survey data from BMGF, 2021)*

## Summary

The secondary data from the Bill and Melinda Gates Foundation's (BMGF) Gates Millennium Scholar Survey (2021) conducted in 2018 informed this study's research questions and hypotheses. The purpose of this quantitative study is to test the relationship between faculty's perceived supportive classroom behaviors and the Native American student's college degree completion experience. The survey responses were stratified to only include Native American college students who earned a college degree, whether undergraduate or graduate. This stratification resulted in a sample size of 344. Cronbach's alpha was computed, and it determined that the survey validity was 98.8%. The Spearman rank correlation test is utilized to find the relationship correlation and strength between the independent and dependent variables. This study's independent variables are perceived faculty supportive behaviors in the classroom. The dependent variable is Native American college student degree persistence.

The Spearman rank correlation test is used as inferential statistics to examine the research hypotheses. The positive monotonic relationship and ordinal ranked variable pairs are met, ensuring the Spearman rank correlation test is most appropriate for rejecting or accepting the null hypotheses. The ordinal ranked data is stratified to  $n=315$  to include only strongly agree (5) and agree (4) survey responses in the Spearman rank correlation test to help mitigate common method bias. The exclusion of the other ordinal ranks provides a stronger examination of this study's faculty support relationship parameters. The Spearman rank correlation test was run and finds that there is a strong, positive correlation between perceived faculty support behaviors on the Native American undergraduate college students' persistence to graduation, which is statistically significant ( $r_s(138) = .617, p < .001$ ). It also finds that there is a moderately strong, positive correlation between perceived faculty support behaviors on the Native American

graduate college students' persistence to graduation, which is statistically significant ( $r_s(173) = .566, p < .001$ ). These findings provide a rejection of both null hypotheses, which state there is no significant relationship strength between perceived faculty supportive behaviors on the Native American undergraduate and graduate college degree experience. This data analysis provides an expansion to the current literature that favored qualitative methods for determining faculty support behaviors and models on the Native American college student experience.

## **CHAPTER FIVE: CONCLUSIONS**

### **Overview**

The purpose of this quantitative study is to test the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience. This study analyzed Gates Millennium Scholars and finalists who identified as Native American from 1999 to 2017 and who responded with positively perceived levels of instructor support. The data in this study is provided by the 2018 Gates Millennium Scholars (GMS) Survey distributed by the Inter-university Consortium for Political and Social Research (ICPSR). This chapter will provide a discussion of the statistical findings, literature implications for the Native American college student experience, research limitations, recommendations for future research, and a summary of final thoughts.

### **Discussion**

The purpose of this quantitative study is to test the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience. The publicly available data in this study is provided by the 2018 Gates Millennium Scholars (GMS) Survey distributed by the Inter-university Consortium for Political and Social Research (ICPSR). This study analyzed Gates Millennium Scholars and finalists who identified as Native American from 1999 to 2017 and who responded with positively perceived levels of instructor support during their degree experience. The participants from this secondary survey data were full-time college students in a university or college who demonstrated a 3.3 or higher GPA on a 4-point scale, were Pell Grant eligible, and were outstanding in community service. The Gates Millennium Scholar survey was selected for this study because it included various degree levels, tribal affiliations, geographical locations, and higher education institutions. The

current literature on the Native American college experience favored studies using specific tribal affiliations, degree programs, and higher education institutions. Additionally, qualitative methods were also favored as the preferred research approach. These gaps in the current literature create this study's significance and impact on addressing the gaps.

This quantitative study to test the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience was performed using SPSS 29. After Cronbach's alpha was computed to determine that the survey validity was 98.8% and the assumption tests for a nonparametric statistical analysis showed a positive monotonic relationship between the ordinally ranked variable pairs, the Spearman rank correlation test was most appropriate to find the relationship correlation and strength between the independent and dependent variables. The independent variables are perceived faculty supportive behaviors in the classroom and the dependent variable is Native American college student degree persistence. The correlation test was performed on the strongly agree (5) and agree (4) survey responses to mitigate a potential response bias. Additionally, the strongly agree (5) and agree (4) were selected in the correlation test because they align with this study's concepts on perceived faculty supportive behaviors. The Spearman rank correlation test conducted in SPSS 29 revealed a statistical significance of perceived faculty support behaviors on the Native American undergraduate ( $r_s(138) = .617, p < .001$ ) and graduate ( $r_s(173) = .566, p < .001$ ) degree experience. The statistical significance rejected both null hypotheses in this study. The following sections will address the results of each research question and its corresponding hypotheses, along with the alignment of other studies conducted in the current literature. No opposition to this study's findings is found in the current literature.

### **Research Question 1 and Hypthoses Discussion**

This quantitative study first asked, “What is the relationship between faculty’s perceived supportive classroom behaviors and undergraduate Native American college students’ self-reported persistence to graduation?” The Spearman rank correlation test was used as inferential statistics to examine the null hypothesis which states there is no significant relationship between faculty’s perceived supportive classroom behaviors on the undergraduate Native American degree completion. The Spearman rank correlation test rejected the null hypothesis and accepted the alternative hypothesis which states that there is a significant relationship between faculty’s perceived supportive classroom behaviors on the undergraduate Native American degree completion. Kumar and Reddi (2023) stated that coefficients or estimated effects of .60 to .79 are considered strong relationships in significance. The Spearman rank correlation test calculated .617 for the coefficient strength with a two-tailed alpha value at  $p < .001$ , which means there is a significantly strong relationship with a very low  $p$  value. Bickel (2021) described low  $p$  values for statistically ensuring the chance of the null hypothesis being true.

The findings from this study’s first research question determine a strong relationship strength between faculty supportive behaviors on the undergraduate Native American college student experience. These findings added to the limited current literature on this topic and although the literature is limited, this study does align with several current research studies that determined frequent faculty interactions, faculty emotional support, trustworthy relationships, and hands-on learning increased Native American undergraduate students' sense of belonging and persistence (Chow-Garcia et al., 2022; Mosholder et al., 2016; Oxendine et al., 2020; Strayhorn et al., 2016). This alignment is present with current studies because the independent variables in this study measured self-perceived faculty support behavior responses from the

Gates Millennium Scholar survey that asked if a student had an instructor who cared about them as a person and if they had at least one instructor that excited them to learn (BMGF, 2021).

Chow-Garcia et al. (2022) determined that faculty using hands-on instruction with undergraduate Native American college students in science programs persisted. Furthermore, the trustworthy relationships built by the supportive faculty in this science program added to the increased persistence posited by Chow-Garcia et al. (2022). Oxendine et al. (2020) found similar study results in a public, four-year higher education institution and the importance of academic relationships for a sense of belonging for Native American undergraduate students. Data was used from the Multi-Institutional Study of Leadership (MSL) that conducted the quantitative study, using a larger sample size compared to other studies in the current literature (Oxendine et al., 2020). The study conducted by Oxendine et al. (2020) on the importance of belonging for Native American undergraduate college students provides alignment to this study because of the supportive instruction provided by many faculty and staff members. Furthermore, Mosholder et al. (2016) presented results that were similar to this study's findings regarding informal faculty interactions that helped support Native American undergraduate college students. The faculty behaviors created a welcomed and valued perception by the Native American undergraduate students, which positively impacted their persistence (Mosholder et al., 2016). Lastly, Strayhorn et al. (2016) concluded that frequent supportive faculty interactions increased Native American undergraduate students' sense of belonging and persistence rate.

Ferguson and Huffman (2018) connected with this study's Two-Eyed Seeing research approach because they found that Native American college students valued a college education to reinforce their Indigenous cultural traditions. This cultural reinforcement was the intrinsic motivation for enrolling, persisting, and graduating from college (Ferguson & Huffman, 2018).

The Two-Eyed Seeing research approach looks at both Indigenous knowledge and Western knowledge to complement the conceptual and theoretical framework used in studies with Indigenous people (Leighton, 2019). Studies by Wilkie (2020) and Guillory (2009) provided further alignment with this study's results on faculty support positively influencing Native American college student success. Wilkie (2020) found that first-year pre-nursing students increased their academic success when they consistently connected with faculty, academic advisors, and tutoring. Furthermore, Guillory (2009) reported that cultural institutional support improved retention strategies for Native American students attending three public universities.

Additionally, two more research studies from two-year higher education institutions found similar results with faculty supportive behaviors on the Native American college undergraduate experience. Schmidtke (2016) found that consistent faculty interactions significantly helped Native American college students at a technical institution persist in their last semester. Students valued faculty who acted as advocates for them during their undergraduate experience (Schmidtke, 2016). McKinsey (2016) found that faculty who acted as advocates and mentors empowered their undergraduate students to see their own potential. Fong et al. (2019) also found similar results with Native American undergraduate students at 156 community colleges, which showed that their academic relationships significantly fostered a sense of belonging and helped with degree persistence. These additional studies showed gaps in the current literature albeit their alignment with this study on the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience. The study conducted by Schmidtke (2016) was approached using a qualitative interview method to collect responses from a small sample of 17 Native American two-year undergraduate students. A larger sample size from the Fong et al. (2019) study helped close the gaps on the smaller sample sizes

when researching Native American college students but was limited to just community college students. Table 9 provides a summary of the discussion for the first research question's hypotheses in this study.

**Table 9**

*RQ1-Discussion Summary*

<b>Research Question 1</b>	<b>Summary Details</b>
What is the relationship between faculty's perceived supportive classroom behaviors and undergraduate Native American college students' self-reported persistence to graduation?	
<b>Null Hypothesis</b>	Rejected
<b>Alternative Hypothesis</b>	Accepted
<b>Statistical Output</b>	$(r_s(138) = .617, p < .001)$
<b>Relationship Strength</b>	Faculty supportive behaviors have a <i>strong</i> relationship on the undergraduate Native American college students's degree completion.
<b>Aligned Studies</b>	(Chow-Garcia et al., 2022; Ferguson & Huffman, 2018; Fong et al., 2019; Guillory, 2009; Mosholder et al, 2016; Oxendine et al, 2020; Schmidtke, 2016; Strayhorn et al., 2016; Wilkie, 2020)

### **Research Question 2 and Hypotheses Discussion**

Next, this quantitative study asked, "What is the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation?" The Spearman rank correlation test also rejected the null hypothesis and accepted the alternative hypothesis, which states that there is a significant relationship

between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion. Compared to the first research question and its corresponding hypotheses, this alternative hypothesis accepted a moderately strong relationship ( $r_s(173) = .566, p < .001$ ) between the variables. The Spearman rank correlation test calculated the relationship strength between faculty perceived behaviors on the graduate Native American degree completion with a .566 correlation strength. Kumar and Reddi (2023) stated that a coefficient between .40 to .59 is moderately strong in statistical significance testing. These findings also note a two-tailed alpha  $p$  value of  $< .001$ , ensuring a significant chance that the null hypothesis is not true.

The quantitative findings for the research question on the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation align with several studies found in the current research. Two of these studies from the current literature were most like this study's purpose and results. The current research demonstrated alignment with this study based on the significant strength of faculty relationships, faculty cultural support, faculty emotional care, and quality faculty feedback on the Native American graduate student college experience (Brazill et al., 2023; Heavy-Runner et al., 2018; Keith et al., 2016; Lundberg & Lowe, 2016). The study by Heavy-Runner et al. (2018) was most like this study's purpose, significance, and results because they found that cultural identity, complemented with faculty relationships, significantly impacted persistence for 54 Native American graduate students. The Two-Eyed Seeing research approach was most apparent in the study by Heavy-Runner et al. (2018) because tribal community and cultural identity were surveyed in the persistence factorial study. Similarly, STEM graduate students who attended doctoral-granting institutions in the Midwest and western parts of the United States found that academic confidence significantly increased because of the culturally

supportive campus environment (Brazill et al., 2023). Mentors and faculty that valued, cared for, and respected Native American graduate students positively impacted the student's sense of belonging (Brazill et al., 2023).

There were very few quantitative and qualitative studies in the current research that looked at Native American graduate student's college experience, as described in the literature review of this study. The lack of Native American graduate student research supports this study's results to address the literature gap. Additional studies by Keith et al. (2016) and Lundberg and Lowe (2016) found alignment with this study's purpose and results but did not specifically look at Native American graduate students. Personalized academic support was found to have a significant positive influence on Native American college success, as reported by Keith et al. (2016). Lundberg and Lowe (2016) found that Native American college students significantly increased learning through frequent and quality feedback from their faculty. The 2007 National Survey of Student Engagement was used to collect 647 responses from Native American college students on engagement factors that helped them persist (Lundberg & Lowe, 2016). Table 10 provides a summary of the discussion for the first research question's hypotheses in this study.

**Table 10**

*RQ2-Discussion Summary*

<b>Research Question 2</b>	<b>Summary Details</b>
What is the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation?	
<b>Null Hypothesis</b>	Rejected
<b>Alternative Hypothesis</b>	Accepted
<b>Statistical Output</b>	$(r_s(173) = .566, p < .001)$

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<b>Relationship Strength</b>	Faculty supportive behaviors have a <i>moderately strong</i> relationship on the graduate Native American college student's degree completion.
<b>Aligned Studies</b>	(Brazill et al., 2023; Heavy-Runner et al., 2018; Keith et al., 2016; Lundberg & Lowe, 2016).

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### Research Questions and Hypotheses Summary

The results from this study were consistent with the current literature and reinforced the significant correlation between faculty interactions, support, and instruction on the Native American college students' self-reported persistence to graduation. Research studies that demonstrate consistency with the existing literature findings strengthen results validity (Mandasini, 2022). No current studies in the literature find opposition to this study's results, albeit the current literature is limited on the Native American college student experience. The research alignment to previous studies and the correlational significance consistency will be further discussed in the research implications section of this chapter.

### Implications

The statistically significant results of this quantitative study that measure the relationship between faculty supportive behaviors and the Native American college student degree experience add to the limited literature. The problem statement in Chapter 1 of this study identified the lack of research on the Native American college student experience (King & Brigham, 2022; Martorelli et al., 2018; Tachine et al., 2016). This study found a strong correlation between faculty supportive behaviors on Native American undergraduate college student degree persistence. Additionally, this study found a moderately strong correlation between faculty supportive behaviors on Native American graduate college student degree

persistence. These results align with several current related studies from the literature, which confirms that this study's results are confidently valid. Implications for the Two-Eyed Seeing research approach, along with implications for faculty support models on Native American undergraduate and graduate students, are provided in this discussion section.

The Sociocultural Learning Theory by Vygotsky (1978) and the Social Integration Model by Tinto (1993) are the theoretical frameworks used in this study. These theoretical frameworks provide the lens for reviewing current related literature to find research gaps. The crux of these theories states that social relationships are an integral part of learning and persistence for students (Tinto, 1993; Vygotsky, 1978). These theoretical frameworks also provide calibration for research results alignment. Furthermore, the Two-Eyed Seeing research approach is used in this study to allow for Indigenous knowledge and Western knowledge to complement the literature review, research gaps, and results alignment.

### **Theoretical Implications for the Two-Eyed Seeing Research Approach**

The Two-Eyed Seeing research approach finds collaboration between Western and Indigenous knowledge, acknowledging that each holds strengths that can be applied to all learners (Matthews, 2021). The Sociocultural Learning Theory and the Social Integration Model are Western worldviews. Indigenous knowledge is learning performed within the tribal community, group work, elder wisdom, observation, emulation, reflection, experiences, visuals, games, and earth-based curriculum (Mercurieff & Roderick, 2013). Two studies by Heavy-Runner et al. (2018) and Ferguson and Huffman (2018) used the Two-Eyed Seeing research approach. The limited studies connecting research with this approach reinforce that this study fills in the gap for expanding the Two-Eyed Seeing approach with research on Native American or Indigenous college students.

### **Practical Implications for Faculty Support Models**

The findings from this study suggest that Native American undergraduate and graduate college students perceive their faculty's supportive behaviors as an integral part of their degree persistence. The responses collected from the Gates Millennium Survey (BMGF, 2021) included faculty support behaviors on faculty who cared about the Native American college student as a person and having at least one faculty member who excited them to learn. The strong and moderately strong correlation, as calculated by the Spearman rank correlation test for Native American undergraduate/graduate college students, has implications for faculty support models in higher education institutions. This study added to the existing scholarly literature on the Native American college student experience because of its alignment with several relevant study results (Brazill et al., 2023; Chow-Garcia et al., 2022; Heavy-Runner et al., 2018; Keith et al., 2016; Lundberg & Lowe, 2016; Mosholder et al., 2016; Oxendine et al., 2020; Strayhorn et al., 2016) and addressed the research gaps determined in the literature review. The literature gaps addressed in this study are findings from a Native American college student sample population that was representative of various degree levels, a ten-year span of degree completion dates, geographical locations, and increased federally recognized tribal affiliations. Additionally, this study performed quantitative, correlative analyses on ordinal ranked data stratified to n=315 Native American participants to find the relationship strength of faculty supportive behaviors on their degree persistence. There were only three peer-reviewed research studies out of 22 relevant studies that used a quantitative methodology and statistical analysis with over 300 Native American college student participants (Fong et al., 2019; Lundberg & Lowe, 2016; Oxendine et al., 2020). Cech et al. (2019) discussed the importance of increasing the limited scholarship on

the Native American college student experience to serve this historically underrepresented student population better.

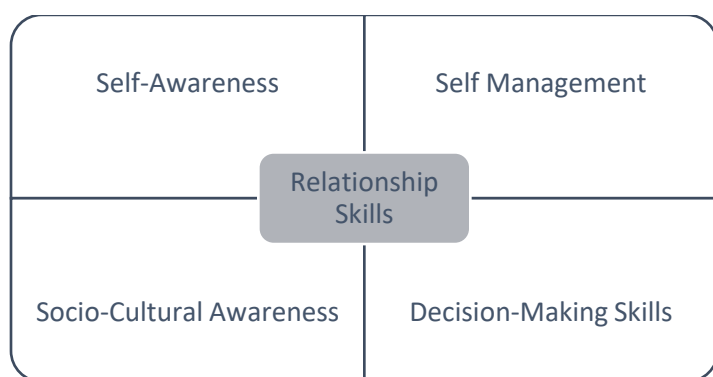
The implications in this study are also important as higher education institutions have seen an increase in diverse student populations from political reformations on college access (Mishra, 2020). Furthermore, the increase in underrepresented minority groups in higher education institutions has led to the development of student success programs and initiatives to address the educational disparities in this student population (Culler & Gándara, 2021). Native American college students are identified as an underrepresented minority student group that tends to have lower college completion rates compared to nonminority college peers (Silver Wolf et al., 2021). College degree attainment is important for Native American college students because of relationality and reciprocity in tribal nation-building (Lopez & Tachine, 2021). This nation-building refers to giving back to tribal communities through increased professional and diverse career representation. Lopez and Tachine (2021) recommended that institutional support models align their Native American student success initiatives with nation-building. This study concluded that faculty supportive behaviors have a significant relationship to Native American college student persistence.

The results from this study and its alignment with other relevant studies suggest that Native American college success programs and initiatives in higher education institutions should ensure faculty are educated and trained on support behaviors that strongly correlate to Native American college persistence. These faculty supportive behaviors correlated in this study were showing care and exciting students to learn. Caring faculty behaviors are described as empathetic concern, motivational empathy, and compassion (Lunn et al., 2022). The Collaborative for Academic, Social, and Emotional Learning (CASEL) (2023) described socio-emotional learning

(SEL) as managing emotions, showing empathy to others, and being culturally aware. Gimbert et al. (2023) concluded that SEL education training programs on creating and sustaining healthy student relationships should be encouraged in the education institutional setting. Figure 6 provides a visual for a faculty training framework for creating and sustaining healthy student relationships. The empathy and care demonstrated by faculty in the classroom connect with the Indigenous cultural ethos of relationality and interconnectedness. Trolian and Parker (2022) asserted that faculty should engage in culturally responsive instructional training to foster their cultural awareness as higher education institutions experience continual increases in underrepresented student minority groups. Cultural awareness in faculty training programs was also found to increase self-awareness, capacity for empathy, and self-efficacy (Hutchins & Goldstein-Hode, 2021). Higher education decision-makers and faculty may find value in offering student feedback surveys to collect perceptions of the empathy demonstrated by faculty for insightful data on the effectiveness of the socio-emotional learning trainings.

### Figure 6

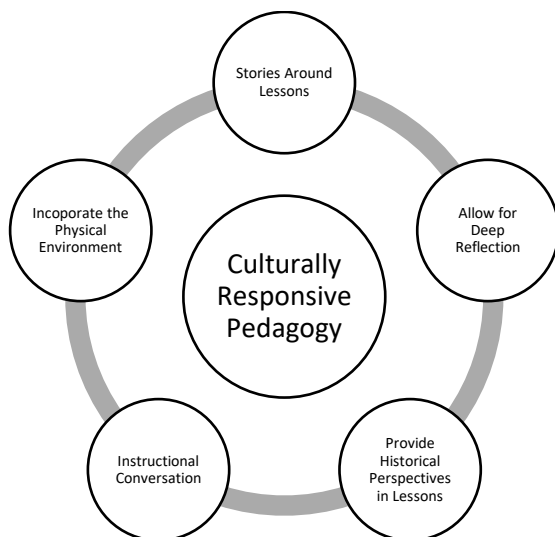
*Faculty Training Framework for Creating and Maintaining Healthy Student Relationships*



*Note. Educator relationship skills framework training (CASEL, 2023; Gimbert et al., 2023)*

This study also found a significant relationship between the faculty's supportive behavior on embedding instructional excitement in the classroom and Native American college student

degree persistence. Implications for this correlation suggest that faculty must provide a classroom experience that actively connects students to the learning. Seemiller et al. (2021) found in the literature that factors in the classroom that demonstrate a connection to the content, enthusiastic instructors, active learning, and applied skills bring pedagogical enjoyment. These factors also relate to Indigenous pedagogy, where learning occurs through creating, storytelling, reflecting, observing, and listening (Barkaskas & Gladwin, 2021). Faculty may find value in incorporating Indigenous cultural stories, involving family, and welcoming tribal communities into the classroom to enhance culturally responsive instruction. This culturally responsive instruction may help Native American college students to connect to the content. Barkaskas and Gladwin (2021) discussed how pedagogical talking circles in the classroom helped with decolonizing Eurocentric pedagogy in a Canadian educational setting. These talking circles provide a space for all students to share perspectives, insights, challenges, and opportunities in their learning. Singh & Espinoza-Herold (2019) suggested that culturally based education and instruction empower students to be successful learners. The researcher recommends that higher education institutions take an active role in training faculty on culturally responsive pedagogy to provide a learning environment that ensures belongingness for their Native American college students. Increasing a sense of belonging for Native American college students can positively influence their enrollment, engagement, and persistence (LaFromboise et al., 2023). Figure 7 shows ways that faculty can bring culturally responsive pedagogy into the classroom that creates learning enjoyment for Native American college students (Smith & Babich, 2021).

**Figure 7***Culturally Responsive Pedagogy*

*Note. Instructional approaches adapted from Smith and Babich (2021)*

### **Limitations**

Granted, this study adds to the existing scholarship and addresses gaps with its insights gained from the significance between faculty supportive behaviors on the Native American college student experience; limitations are present within the research. Limitations refer to weaknesses in all research studies that can impact the implications and conclusions of the study (Ross & Zaidi, 2019). These limitations may occur in any of the methodological research approaches and are important to disclose for study credibility. This section provides details on the methodological and research process limitations of the study. These methodological limitations include a small sample size and a lack of detailed data. The research process limitations include secondary data access and analysis. Additionally, the researcher describes the steps taken to minimize the limitations.

## **Methodological Limitations**

The secondary data used in this study resulted in a small sample size after two iterations of data stratification. Stratification refers to data that has been sorted into groupings based on the parameters of the research (Creswell & Creswell, 2018). In this study, the initial data stratification included removing any Gates Millennium Scholar survey respondents who did not identify as Native American or American Indian. This resulted in n=344 survey respondents. To mitigate common method bias, the second data stratification iteration was performed in the data analysis by removing any survey responses that were selected as strongly disagree (1), disagree (2), and neutral (3). After this second stratification, the sample size results in n=315. A large sample size provides a robust representation of the population and increases the accuracy of the results for that specific population being researched (Andrade, 2020). To minimize the internal threat validity from the smaller sample size limitation used in this study, Slovin's formula (see Appendix A) was calculated and found that the minimum sample size for a reliable research study was met.

An additional limitation of this study is the lack of detailed variable data. The secondary dataset used in this study was collected from the 2018 Gates Millennium Scholars Survey (BMGF, 2021) and distributed by the Inter-university Consortium for Political and Social Research (ICPSR). This dataset provided only two survey responses that met the parameters of the appreciative inquiry-based research this study uses. Appreciative inquiry-based research is an inclusionary approach that highlights strengths, positive attributes, and best practices (Garrett, 2022). These survey responses were listed as having a faculty member who cared and at least one faculty member who made learning exciting in the classroom. These responses are vague in detail and could potentially threaten construct validity. Construct validity relates to the

interpretation of the constructs captured in the survey data (Matthay & Glymour, 2020). To minimize this construct validity threat, the researcher used the Two-Eyed Seeing research approach. The Sociocultural Learning Theory (Vygotsky, 1978) and the Social Integration Model (Tinto, 1993) connect with Indigenous knowledge on the importance of interpersonal relationships, culture, and community on learner success. Faculty care and instructional practices that enhance learner excitement align with these theoretical frameworks.

### **Research Process Limitations**

The secondary data from the 2018 Gates Millenium Scholars Survey (BMGF, 2021) offers an additional limitation to this study. Secondary data analysis can cause researcher biases through prior knowledge of data constructs along with data flexibility (Baldwin et al., 2022). This data was distributed by the Inter-university Consortium for Political and Social Research (ICPSR). The ICPSR removed all sensitive identifiers from the public dataset. A limitation of this dataset is the lack of information on the higher education institution the Native American college student attended. This information may have enhanced the implications of the study's results by capturing institutional demographics. Additional research questions may have been identified with this information. The internal threat to validity regarding researcher bias is minimized by conducting an appreciative inquiry literature review first to determine the gaps. Once the gaps in the existing literature were determined, datasets that met the research construct were searched. The 2018 Gates Millenium Scholars Survey (BMGF, 2021) was found to be aligned with the gaps and parameters of this study.

### **Recommendations for Future Research**

The limitations discussed in this study provide recommendations for future research on the relationship between faculty supportive behaviors on the Native American college student

degree experience. The first recommendation for future research is to collect primary data on a larger sample size that includes additional faculty supportive behaviors to expand on the significance these have on the Native American college student's degree persistence. These independent variables may include perceptions of faculty instructional methods, faculty interaction frequency, faculty's cultural awareness, and faculty's involvement with students' families. Responses and correlational insights from these additional variables may help reinforce the researcher's assumptions discussed in the implications of this study.

An additional recommendation to enhance future studies on faculty supportive behaviors on the Native American college degree experience is to include higher education institutional data. A quantitative approach using a *t*-test may be valuable in comparing (Creswell & Creswell, 2018) public higher education institutions and tribal colleges and universities on the correlation of faculty supportive behaviors. Furthermore, data on the higher education institutions attended by Native American college students may assist in addressing the gaps present in the existing literature. Many studies were conducted at specific institutions or geographical locations.

Lastly, a recommendation for future research is to conduct a mixed method research approach to compare different perspectives from the quantitative and qualitative data (Creswell & Creswell, 2018). Creswell and Creswell (2018) stated that mixed methods may also provide a deeper understanding of social research with marginalized groups. This mixed method approach may perform a Likert-scaled survey to collect faculty supportive behaviors complemented with participant interviews to collect phenomenological insights into Native American college students' lived experiences.

## Conclusion

Native American college student research continues to lack in scholarly literature. The current literature found only 22 peer-reviewed articles that related to the Native American college student experience. This study used a Two-Eyed Seeing research approach that connects Indigenous knowledge and Western knowledge for complementary insights into the research constructs. Furthermore, an appreciative inquiry was used in the literature review to ensure inclusionary constructs were identified in the existing literature. Gaps in the existing literature include sample sizes below 300 participants, qualitative methodologies favored, specific degree levels, degree program variety, fixed geographical demographics, and limited tribal affiliation representation. To address this problem, this quantitative study's purpose was to test the correlation between perceived levels of faculty support behaviors on the Native American student's college degree completion experience. The following research questions and their corresponding hypotheses that guided this study tested n=344 nationwide Gates Millennium Scholar recipients and finalists who identified as Native American and earned a college degree from 1999 to 2017 (BMGF, 2021) to ask:

**RQ1:** What is the relationship between faculty's perceived supportive classroom behaviors and undergraduate Native American college students' self-reported persistence to graduation?

**H<sub>0</sub>1:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman Rank Correlation test.

**H<sub>a</sub>1:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the undergraduate Native American degree completion, as measured by the Spearman Rank Correlation test.

**RQ2:** What is the relationship between faculty's perceived supportive classroom behaviors and graduate Native American college students' self-reported persistence to graduation?

**H<sub>02</sub>:** There is no significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman Rank Correlation test.

**H<sub>a2</sub>:** There is a significant relationship between faculty's perceived supportive classroom behaviors on the graduate Native American degree completion, as measured by the Spearman Rank Correlation test.

The Spearman rank correlation is determined to be the most appropriate data analysis test for this study. The data met nonparametric assumptions with evidence of a positive monotonic relationship between the variables and ordinaly ranked data. The data was stratified to include n=315 strongly agree (5) and agree (4) survey responses to mitigate common method bias and connect with this study's parameters. The Spearman rank correlation test conducted in SPSS 29 revealed a statistical significance of perceived faculty support behaviors on the Native American undergraduate ( $r_s(138) = .617, p < .001$ ) and graduate ( $r_s(173) = .566, p < .001$ ) degree experience. The statistical significance rejected both null hypotheses (H<sub>01</sub> and H<sub>02</sub>) in this study. Additionally, these statistical findings aligned with several related studies in the literature, increasing the validity of these results.

Implications from this study's statistical significance findings assume that higher education institutions may find opportunities to train faculty on socio-emotional learning (SEL), cultural awareness, and culturally responsive pedagogy. These recommendations may enhance faculty supportive behaviors toward Native American college students and potentially mitigate educational disparities. Furthermore, this quantitative study addresses the gaps in the existing

literature because it provides a larger sample size compared to most related studies. These addressed gaps also include participants who obtained various degree levels, were located geographically across the United States and attended various higher education institutions.

Research credibility is important so limitations are provided by the researcher, including methodological and research process limitations. This study performed a correlational test on a  $n=315$  sample size. This internal threat to validity is minimized by calculating Slovin's formula, which ensures the sample size is large enough to generalize findings on the sample population. Construct validity is also determined as a limitation in this study. The researcher used the Two-Eyed Seeing research approach, which complements Indigenous knowledge with the Sociocultural Learning Theory and the Social Integration Model. These theoretical frameworks provided a lens for the literature review and secondary data selection to help external validity threats. Research bias is also minimized by determining the existing literature gaps before selecting a secondary dataset to meet the parameters of this study.

Recommendations for future research on faculty supportive behaviors on the Native American college experience include a larger sample size with additional variables on faculty supportive behaviors. Future research may find value in collecting detailed data on higher education institutional demographics to perform  $t$ -test analyses. Lastly, a mixed methods research approach with a Likert scale survey on perceived faculty supportive behaviors and qualitative interview questions may add robust findings to the existing literature.

**REFERENCES**

- Abdul-Rahaman, N., Terentev, E., & Arkorful, V. E. (2022). The tertiary experience: Of social integration, retention, and persistence – A Review. *Public Organization Review*, 23(1), 133–147. <https://doi.org/10.1007/s11115-022-00603-2>
- Adams, D. R., Meyers, S. A., & Beidas, R. S. (2016). The relationship between financial strain, perceived stress, psychological symptoms, and academic and social integration in undergraduate students. *Journal of American College Health*, 64(5), 362–370. <https://doi.org/10.1080/07448481.2016.1154559>
- Ahn, M. Y., & Davis, H. H. (2020). Students’ sense of belonging and their socio-economic status in higher education: A quantitative approach. *Teaching in Higher Education*, 28(1), 136–149. <https://doi.org/10.1080/13562517.2020.1778664>
- Ajayi, A. A., Mitchell, L. L., Nelson, S. C., Fish, J., Peissig, L. H., Causadias, J. M., & Syed, M. (2021). Person–environment fit and retention of racially minoritized college students: Recommendations for faculty, Support Staff, and administrators. *Education Sciences*, 11(6), 271. <https://doi.org/10.3390/educsci11060271>
- Ali, T., Buergelt, P. T., Maypilama, E. L., Paton, D., Smith, J. A., & Jehan, N. (2021). Synergy of systems theory and symbolic interactionism: A passageway for non-Indigenous researchers that facilitates better understanding Indigenous worldviews and knowledges. *International Journal of Social Research Methodology*, 25(2), 197–212. <https://doi.org/10.1080/13645579.2021.1876300>

- Alkholly, S. O., Gendron, F., McKenna, B., Dahms, T., & Ferreira, M. P. (2017). Convergence of Indigenous science and western science impacts students' interest in stem and identity as a scientist. *Ubiquitous Learning: An International Journal*, *10*(1), 1–13.  
<https://doi.org/10.18848/1835-9795/cgp/v10i01/1-13>
- Alkhudiry, R. (2022). The contribution of Vygotsky's sociocultural theory in mediating L2 knowledge co-construction. *Theory and Practice in Language Studies*, *12*(10), 2117–2123.  
<https://doi.org/10.17507/tpls.1210.19>
- American Indian College Fund. (2019). *Creating visibility and healthy learning environments for Native Americans in higher education*. [https://resources.collegefund.org/wp-content/uploads/Creating-Visibility-and-Healthy-Learning-Environments-for-Natives-in-Higher-Education\\_web.pdf](https://resources.collegefund.org/wp-content/uploads/Creating-Visibility-and-Healthy-Learning-Environments-for-Natives-in-Higher-Education_web.pdf)
- American Indian Higher Education Consortium. (2018). *TCU roster and profiles*.  
<https://www.aihec.org/tcu-roster-and-profiles/>
- Andrade, C. (2020). Sample size and its importance in research. *Indian Journal of Psychological Medicine*, *42*(1), 102–103. [https://doi.org/10.4103/ijpsym.ijpsym\\_504\\_19](https://doi.org/10.4103/ijpsym.ijpsym_504_19)
- Andrade, C. (2021). A Student's Guide to the classification and operationalization of variables in the conceptualization and design of a clinical study: Part 1. *Indian Journal of Psychological Medicine*, *43*(2), 177–179. <https://doi.org/10.1177/0253717621994334>

- Antoine, A., Mason, R., Mason, R., Palahicky, S., & Carmen, R. M. del. (2018). *Pulling together: A guide for curriculum developers*. BCcampus, BC Open Textbook Project.
- Arum, R., Eccles, J. S., Heckhausen, J., Orona, G. A., von Keyserlingk, L., Wegemer, C. M., Wright, C. E., & Yamaguchi-Pedroza, K. (2021, May). *Ensuring a more equitable future: Assessing student learning and growth in higher education*. Postsecondary Value Commission.
- Asenahabi, B., & Ikoha, P. (2023). Scientific research sample size determination. *The International Journal of Science and Technology*, *11*(7), 8–12.  
<https://doi.org/10.24940/theijst/2023/v11/i7/ST2307-008>
- Baik, C., Larcombe, W., & Brooker, A. (2019). How universities can enhance student mental wellbeing: The student perspective. *Higher Education Research & Development*, *38*(4), 674–687. <https://doi.org/10.1080/07294360.2019.1576596>
- Baldwin, J., Pingault, J.-B., Schoeler, T., Sallis, H., & Munafò, M. R. (2022). Protecting against researcher bias in secondary data analysis: Challenges and potential solutions.  
<https://doi.org/10.31234/osf.io/md5pe>
- Barkaskas, P., & Gladwin, D. (2021). Pedagogical talking circles: Decolonizing education through relational Indigenous frameworks. *Journal of Teaching and Learning*, *15*(1), 20–38. <https://doi.org/10.22329/jtl.v15i1.6519>
- Beuving, J., & de Vries, G. (2015). *Doing qualitative research: The craft of naturalistic inquiry*. Amsterdam University Press.

- Bickel, D. R. (2021). Interval estimation, point estimation, and null hypothesis significance testing calibrated by an estimated posterior probability of the null hypothesis. *Communications in Statistics - Theory and Methods*, 52(3), 763–787.  
<https://doi.org/10.1080/03610926.2021.1921805>
- Biin, D., Simcoe, J., Erickson, M., Antoine, A., Cull, I., Hancock, R. L. A., McKeown, S., Pidgeon, M., & Vedan, A. (2018). *Indigenous ways of knowing and being. Pulling together a guide for front line staff student services and advisors.*  
<https://opentextbc.ca/indigenizationfrontlineworkers/chapter/indigenous-ways-of-knowing-and-being/>
- Bill and Melinda Gates Foundation. (2021). *Gates Millennium Scholars (GMS) Survey, United States, 2018* [dataset]. Inter-university Consortium for Political and Social Research [distributor]. <https://doi.org/10.3886/ICPSR37665.v1>
- Bombardieri, M. S., & Horwedel, D. M. (2022, November 18). *For Native Americans, tribal colleges tackle the “present-day work of our ancestors.”* Center for American Progress.  
<https://www.americanprogress.org/article/for-native-americans-tribal-colleges-tackle-the-present-day-work-of-our-ancestors/>
- Bonato, S. (2018). *Searching the grey literature: A handbook for searching reports, working papers, and other unpublished research.* Rowman & Littlefield.
- Bonilla-Silva, E., & Peoples, C. E. (2022). Historically white colleges and universities: The unbearable whiteness of (most) colleges and universities in America. *American Behavioral Scientist*, 66(11), 1490–1504. <https://doi.org/10.1177/00027642211066047>

- Bordelon, T. D., & Atkinson, A. (2020). A pathway for Native American students to access a mainstream university for social work education. *Journal of Social Work Education, 56*(1), 91–104. <https://doi.org/10.1080/10437797.2019.1642272>
- Bowden, J. L.-H., Tickle, L., & Naumann, K. (2019). The four pillars of tertiary student engagement and success: A holistic measurement approach. *Studies in Higher Education, 46*(6), 1207–1224. <https://doi.org/10.1080/03075079.2019.1672647>
- Brazill, S. C., Myers, C. B., Myers, S. M., & Johnson, C. M. (2023). Cultural congruity and academic confidence of American Indian graduate students in stem: Peer interactions, mentor cultural support, and university environment fit. *Journal of Diversity in Higher Education, 16*(4), 425–436. <https://doi.org/10.1037/dhe0000353>
- Brey, de C., Musu-Gillette, L., & McFarland, J. *Status and trends in the education of racial and ethnic groups, 2018* (2019). Washington, DC; U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences.
- Brockie, T. N., Hill, K., Davidson, P. M., Decker, E., Krienke, L. K., Nelson, K. E., Nicholson, N., Werk, A. M., Wilson, D., & Around Him, D. (2022). Strategies for culturally safe research with Native American communities: An integrative review. *Contemporary Nurse, 58*(1), 8–32. <https://doi.org/10.1080/10376178.2021.2015414>
- Bryan, R. (2019). The influence of tribal colleges and universities on Native American student persistence. *New Directions for Student Services, 2019*(167), 49–62. <https://doi.org/10.1002/ss.20320>

Bryant, J. (2021, March 18). *American higher education has failed Native American students again and again, and colleges and universities must critically examine their campuses and curricula*. Inside Higher Ed. <https://www.insidehighered.com/advice/2021/03/19/colleges-must-critically-examine-how-they-educate-native-american-students-opinion>

Bunkowski, L., & Shelton, K. (2019). Misson, vision, and core values through online education: A Case study on tribal college leadership. *Quarterly Review of Distance Education*, 20(4), 1–26.

CASEL. (2023). *Fundamentals of sel*. <https://casel.org/fundamentals-of-sel/>

Cech, E. A., Smith, J. L., & Metz, A. (2019). Cultural processes of ethnoracial disadvantage among Native American college students. *Social Forces*, 98(1), 355–380.  
<https://doi.org/10.1093/sf/soy103>

Center for Community College Engagement. (2019). An Exploration of student experiences at tribal colleges. *Center for Community College Engagement*. Retrieved 2023, from [https://cccse.org/sites/default/files/Tribal\\_Colleges.pdf](https://cccse.org/sites/default/files/Tribal_Colleges.pdf).

Charbonneau-Dahlen, B. K. (2015). Hope: The dream catcher-medicine wheel retention model for diverse nursing students. *Journal of Theory Construction & Testing*, 19(2), 47–54.  
Academic Search Complete.

Chelberg, K., & Bosman, L. (2020). American Indian college student mentoring: A study to measure changes in self-efficacy. *Education Sciences*, 10(2), 38.  
<https://doi.org/10.3390/educsci10020038>

- Chow-Garcia, N., Lee, N., Svihla, V., Sohn, C., Willie, S., Holsti, M., & Wandinger-Ness, A. (2022). Cultural identity central to Native American persistence in science. *Cultural Studies of Science Education*, 17(2), 557–588. <https://doi.org/10.1007/s11422-021-10071-7>
- Chung, W., Jiang, S.-F., Milham, M. P., Merikangas, K. R., & Paksarian, D. (2023). Inequalities in the incidence of psychotic disorders among racial and ethnic groups. *American Journal of Psychiatry*. <https://doi.org/10.1176/appi.ajp.20220917>
- Clayton, T. B. (2021, January 13). *Refocusing on diversity, equity, and inclusion during the pandemic and beyond: Lessons from a community of practice*. Higher Education Today. <https://www.higheredtoday.org/2021/01/13/refocusing-diversity-equity-inclusion-pandemic-beyond-lessons-community-practice/>
- Cong-Lem, N. (2022). Vygotsky's, Leontiev's and Engeström's cultural-historical (activity) theories: Overview, clarifications and implications. *Integrative Psychological and Behavioral Science*, 56(4), 1091–1112. <https://doi.org/10.1007/s12124-022-09703-6>
- Conrad, C., & Lundberg, T. (2022). *Learning with others: Collaboration as a pathway to college student success*. Johns Hopkins University Press.
- Cooksey, R. W. (2020). Descriptive statistics for summarising data. In R. W. Cooksey (Ed.), *Illustrating Statistical Procedures: Finding Meaning in Quantitative Data* (pp. 61–139). Springer Singapore. [https://doi.org/10.1007/978-981-15-2537-7\\_5](https://doi.org/10.1007/978-981-15-2537-7_5)
- Council for Higher Education Accreditation. (n.d.). *About accreditation*. CHEA. <https://www.chea.org/about-accreditation>

- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.
- Cuellar, M. G., & Gándara, P. (2021). Promoting access and equity for underrepresented racial minorities? An examination of policies and practices in community college baccalaureate programs. *Community College Review, 49*(1), 52–75.  
<https://doi.org/10.1177/0091552120964877>
- Daneshfar, S., & Moharami, M. (2018). Dynamic assessment in Vygotsky's sociocultural theory: Origins and main concepts. *Journal of Language Teaching and Research, 9*(3), 600.  
<https://doi.org/10.17507/jltr.0903.20>
- Darlington, R. B., & Hayes, A. F. (2017). *Regression analysis and linear models concepts, applications, and implementation*. The Guilford Press.
- Davis, L. P., & Museus, S. D. (2019). What is deficit thinking? An analysis of conceptualizations of deficit thinking and implications for scholarly research. *NCID Currents, 1*(1).  
<https://doi.org/10.3998/currents.17387731.0001.110>
- de Bray, C., Musu, L., McFarland, J., Wilkenson-Flicker, S., Diliberti, M., Zhang, A., Bransetter, C., & Wang, X. (2019, February). *Status and trends in the education of racial and ethnic groups 2018*. National Center for Education Statistics.  
<https://nces.ed.gov/pubs2019/2019038.pdf>

- Echohawk, C. (2021). Stolen land, stolen bodies, and stolen stories. *Stanford Social Innovation Review*.  
[https://doi.org/https://ssir.org/articles/entry/stolen\\_land\\_stolen\\_bodies\\_and\\_stolen\\_stories](https://doi.org/https://ssir.org/articles/entry/stolen_land_stolen_bodies_and_stolen_stories).
- Elliott-Groves, E., Hardison-Stevens, D., & Ullrich, J. (2020). Indigenous relationality is the heartbeat of Indigenous existence during COVID-19. *Journal of Indigenous Social Development*, 9(3).
- Engel, L. C. (2019). Pathways of internationalization in US schooling: Local innovations in inclusive global education. *Policy Futures in Education*, 17(6), 699–714.  
<https://doi.org/10.1177/1478210319833241>
- Fandino, W. (2019). Formulating a good research question: Pearls and pitfalls. *Indian Journal of Anaesthesia*, 63(8), 611. [https://doi.org/10.4103/ija.ija\\_198\\_19](https://doi.org/10.4103/ija.ija_198_19)
- Felten, P., & Lambert, L. M. (2020). *Relationship-rich education how human connections drive success in college*. Johns Hopkins University Press.
- Ferguson, R., & Huffman, T. (2018). Factors associated with the post-college aspiration to serve reservation communities among Native American college students. *Educational Research: Theory and Practice*, 29(1), 1–14.
- Fetter, A., & Thompson, M. (2023). The impact of historical loss on Native American college students' mental health: The protective role of ethnic identity. *Journal of Counseling Psychology*. <https://doi.org/10.31234/osf.io/jx8z4>

- Fish, J., & Syed, M. (2018). Native Americans in higher education: An ecological systems perspective. *Journal of College Student Development, 59*(4), 387–403.  
<https://doi.org/10.1353/csd.2018.0038>
- Fong, C. J., Alejandro, A. J., Krou, M. R., Segovia, J., & Johnston-Ashton, K. (2019). Ya'at'eeh: Race-reimagined belongingness factors, academic outcomes, and goal pursuits among Indigenous community college students. *Contemporary Educational Psychology, 59*, 101805. <https://doi.org/10.1016/j.cedpsych.2019.101805>
- Freire, C., Ferradás, M. del, Regueiro, B., Rodríguez, S., Valle, A., & Núñez, J. C. (2020). Coping strategies and self-efficacy in university students: A person-centered approach. *Frontiers in Psychology, 11*. <https://doi.org/10.3389/fpsyg.2020.00841>
- Gallup. (2019). *Alumni of tribal colleges and universities better their communities*. <https://www.gallup.com/education/265871/tribal-college-university-alumni-outcomes.aspx>. [https://collegefund.org/wp-content/uploads/2020/03/Gallup\\_Report\\_Final\\_8-1-192.pdf](https://collegefund.org/wp-content/uploads/2020/03/Gallup_Report_Final_8-1-192.pdf)
- Garrett, M. D. (2022). Applying appreciative inquiry to research in the field of inclusive education. *Canadian Journal for New Scholars in Education, 13*(1), 104–115.
- Gates millennium scholars program*. GMSP. (n.d.). <https://gmsp.org/>
- Gillen-O'Neel, C. (2019). Sense of belonging and student engagement: A daily study of first- and continuing-generation college students. *Research in Higher Education, 62*(1), 45–71.  
<https://doi.org/10.1007/s11162-019-09570-y>

- Gimbert, B. G., Miller, D., Herman, E., Breedlove, M., & Molina, C. E. (2023). Social emotional learning in schools: The importance of educator competence. *Journal of Research on Leadership Education*, 18(1), 3–39. <https://doi.org/10.1177/19427751211014920>
- Glăveanu, V. P. (2020). A sociocultural theory of creativity: Bridging the social, the material, and the psychological. *Review of General Psychology*, 24(4), 335–354. <https://doi.org/10.1177/1089268020961763>
- Gonzalez, M. (2022). The enduring flame: Stress, epigenetics, and the California Indian 1769–2000. *The American Indian Quarterly*, 46(4), 299–322. <https://doi.org/10.1353/aiq.2022.0021>
- Gopalan, M., & Brady, S. T. (2019). College students' sense of belonging: A national perspective. *Educational Researcher*, 49(2), 134–137. <https://doi.org/10.3102/0013189x19897622>
- Guillory, R. M. (2009). American Indian/Alaska Native College student retention strategies. *Journal of Developmental Education*, 33(2), 12–38. Education Source.
- Gusenbauer, M., & Haddaway, N. R. (2019). Which academic search systems are suitable for systematic reviews or meta-analyses? Evaluating retrieval qualities of Google Scholar, Pubmed, and 26 other resources. *Research Synthesis Methods*, 11(2), 181–217. <https://doi.org/10.1002/jrsm.1378>
- Harris, M. A., & Orth, U. (2020). The link between self-esteem and social relationships: A meta-analysis of longitudinal studies. *Journal of Personality and Social Psychology*, 119(6),

1459–1477. <https://doi.org/10.1037/pspp0000265>

Henne-Ochoa, R., Elliott-Groves, E., Meek, B. A., & Rogoff, B. (2020). Pathways forward for Indigenous language reclamation: Engaging Indigenous epistemology and learning by observing and pitching in to family and community endeavors. *The Modern Language Journal*, *104*(2), 481–493. <https://doi.org/10.1111/modl.12652>

Hershbein, B., Kearney, M. S., & Pardue, L. (2020). College attainment, income inequality, and economic Security: A simulation exercise. *Upjohn Institute for Employment Research*, 20–319. <https://doi.org/10.3386/w26747>

Howard, J. L., Bureau, J. S., Guay, F., Chong, J. X., & Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspectives on Psychological Science*, *16*(6), 1300–1323. <https://doi.org/10.1177/1745691620966789>

Howard, T. C. (2021). Culturally Responsive Pedagogy. In *Transforming multicultural education policy and practice: Expanding educational opportunity* (pp. 137–163). essay, Teachers College Press.

Howard, M. A., & Kern, A. L. (2019). Conceptions of wayfinding: Decolonizing science education in pursuit of Native American success. *Cultural Studies of Science Education*, *14*(4), 1135–1148. <https://doi.org/10.1007/s11422-018-9889-6>

Huang, Y.-C. (2021). Comparison and contrast of Piaget and Vygotsky's theories. *Advances in Social Science, Education and Humanities Research*, *554*, 28–32.

- Hunt Institute. (2022, Spring). *Supporting Native American students*. <https://hunt-institute.org>.  
<https://hunt-institute.org/wp-content/uploads/2022/04/Hi-Indigenous-Student-Brief-2022.pdf>
- Hunziker, S., & Blankenagel, M. (2021). Multiple case research design. In S. Hunziker & M. Blankenagel (Eds.), *Research design in business and management: A Practical guide for students and researchers* (pp. 171–186). Springer Fachmedien Wiesbaden.  
[https://doi.org/10.1007/978-3-658-34357-6\\_9](https://doi.org/10.1007/978-3-658-34357-6_9)
- Hutchins, D., & Goldstein Hode, M. (2021). Exploring faculty and staff development of cultural competence through communicative learning in an online diversity course. *Journal of Diversity in Higher Education*, *14*(4), 468–479. <https://doi.org/10.1037/dhe0000162>
- Hutchison, L., & McAlister-Shields, L. (2020). Culturally responsive teaching: Its application in higher education environments. *Education Sciences*, *10*(5), 124.  
<https://doi.org/10.3390/educsci10050124>
- Iagulli, P. (2019). Interactionism and the sociology of emotions. *Italian Sociological Review*, *9*(2), 195–208. <https://doi.org/10.13136/isr.v9i2.276>
- Iannario, M., Manisera, M., Piccolo, D., & Zuccolotto, P. (2018). Ordinal data models for no-opinion responses in attitude survey. *Sociological Methods & Research*, *49*(1), 250–276. <https://doi.org/10.1177/0049124118769081>
- Institute of American Indian Arts. (2023, January). *About*. Institute of American Indian Arts (IAIA). <https://iaia.edu/about/>

Indian Affairs Bureau. (2021). *Indian Entities recognized by and eligible to receive services from the United States Bureau of Indian Affairs*. Federal Register .

<https://www.federalregister.gov/documents/2022/01/28/2022-01789/indian-entities-recognized-by-and-eligible-to-receive-services-from-the-united-states-bureau-of>

Integrated Postsecondary Education Data System. (2019). *Indicator 23: Postsecondary Graduation Rates*. IPEDS. <https://nces.ed.gov/ipeds/>

Ismail, I., Pernadi, N., & Febriyanti, A. (2022). How to grab and determine the size of the sample for research. *International Journal of Academic and Applied Research (IJAAR)*, 6(9), 88–92.

Jarrett, K. (2022). The utility of game-based approaches within the PE curriculum design and implementation process to develop “more knowledgeable others.” *Strategies*, 35(3), 3–10. <https://doi.org/10.1080/08924562.2022.2052774>

JEC. (n.d.). *Native American communities continue to face barriers to opportunity*. Joint Economic Committee. [https://www.jec.senate.gov/public/\\_cache/files/9a6bd201-d9ed-4615-bc32-9b899faf5627/nativeamericanscontinuetofacepervasiveeconomicdisparaties-final.pdf](https://www.jec.senate.gov/public/_cache/files/9a6bd201-d9ed-4615-bc32-9b899faf5627/nativeamericanscontinuetofacepervasiveeconomicdisparaties-final.pdf)

Jenkins, D. G., & Quintana-Ascencio, P. F. (2020). A solution to minimum sample size for regressions. *PLOS ONE*, 15(2). <https://doi.org/10.1371/journal.pone.0229345>

Kahlke, R., Bates, J., & Nimmon, L. (2018). When I say ... sociocultural learning theory. *Medical Education*, 53(2), 117–118. <https://doi.org/10.1111/medu.13626>

- Kang, H., & Huh, S. (2021). Sample size determination and power analysis using the G\*Power software. *Jeehp*, *18*(0), 17–0. <https://doi.org/10.3352/jeehp.2021.18.17>
- Kayira, J., Lobdell, S., Gagnon, N., Healy, J., Hertz, S., McHone, E., & Schuttenberg, E. (2022). Responsibilities to decolonize environmental education: A co-learning journey for graduate students and instructors. *Societies*, *12*(4), 96. <https://doi.org/10.3390/soc12040096>
- Keith, J. F., Stastny, S. N., & Brunt, A. (2016). Barriers and strategies for success for American Indian college students: A Review. *Journal of College Student Development*, *57*(6), 698–714. <https://doi.org/10.1353/csd.2016.0069>
- Keith, J. F., Stastny, S. N., Brunt, A., Agnew, W., & Aune, P. (2017). Effects of a culturally-relevant educational intervention on college retention and self-efficacy for healthy choices among American Indian college students. *Journal of the Academy of Nutrition and Dietetics*, *115*(9). <https://doi.org/10.1016/j.jand.2015.06.018>
- Kerk, C., & Kellogg, S. (2014). Developing a culture of support for recruitment and retention of American Indian students. *2014 IEEE Frontiers in Education Conference (FIE) Proceedings*. <https://doi.org/10.1109/fie.2014.7044271>
- Kim, S. (2019). Cross-sectional and longitudinal studies. *Encyclopedia of Gerontology and Population Aging*, 1–4. [https://doi.org/10.1007/978-3-319-69892-2\\_576-1](https://doi.org/10.1007/978-3-319-69892-2_576-1)
- Kimmons, R., & Caskurlu, S. (2020). *The Students' guide to learning design and research* (1st ed.). EdTech Books.

King, A. E., & Brigham, S. M. (2022). "I was like an alien": Exploring how Indigenous student succeed in university studies. *The Canadian Journal of Higher Education*, 52(4), 41-55.

<https://www.proquest.com/scholarly-journals/i-was-like-alien-exploring-how-indigenous/docview/2845111041/se-2>

Kock, F., Berbekova, A., & Assaf, A. G. (2021). Understanding and managing the threat of common method bias: Detection, prevention and control. *Tourism Management*, 86, 104330. <https://doi.org/10.1016/j.tourman.2021.104330>

Kumar, K., & Reddi, V. (2023). Significance of Spearman's rank correlation coefficient. *International Journal For Multidisciplinary Research*, 5(4).

<https://doi.org/10.36948/ijfmr.2023.v05i04.5203>

Kumar, R. (2023). Challenges and strategies for improving minority education access and success. *Sage Science Review of Educational Technology*, 6(1), 48–58.

<https://doi.org/journals.sagescience.org/index.php/ssret/article/view/59>

Kvam, P. H., Vidakovic, B., & Kim, S.-J. (2023). *Nonparametric statistics with applications to science and engineering with R*. John Wiley & Sons Inc.

LaFromboise, T., Rosales, O., & Hosseini, Z. (2023). Effects of bicultural competence and racial identity on intrinsic motivation: The mediating role of belonging to Native American tribal colleges. *Contemporary Educational Psychology*, 74, 102203.

<https://doi.org/10.1016/j.cedpsych.2023.102203>

- Lai, W.F. (2023). Integrating sociocultural perspectives into a university classroom: A case study of students' experience. *Heliyon*, 9(6). <https://doi.org/10.1016/j.heliyon.2023.e17228>
- Lawrence, E. M. (2017). Why do college graduates behave more healthfully than those who are less educated? *Journal of Health and Social Behavior*, 58(3), 291–306.  
<https://doi.org/10.1177/0022146517715671>
- Leighton, E. (2019). *Two-eyed seeing: The gift of multiple perspectives*. Schulich Communications - Western University.  
[https://www.schulich.uwo.ca/research/about\\_us/monthly\\_enewsletter/2019/march/the\\_gift\\_of\\_multiple\\_perspectives.html](https://www.schulich.uwo.ca/research/about_us/monthly_enewsletter/2019/march/the_gift_of_multiple_perspectives.html)
- Little, B. (2023, July 11). *How boarding schools tried to “kill the Indian” through assimilation*. History.com. <https://www.history.com/news/how-boarding-schools-tried-to-kill-the-indian-through-assimilation>
- Littletree, S., Belarde-Lewis, M., & Duarte, M. (2020). Centering relationality: A conceptual model to advance Indigenous knowledge organization practices. *Knowledge Organization*, 47(5), 410–426. <https://doi.org/10.5771/0943-7444-2020-5-410>
- Lopez, E. V. (2023, February 7). *Testing for measurement invariance using Lavaan (in R)*. UC Berkeley D Lab. <https://dlab.berkeley.edu/news/testing-measurement-invariance-using-lavaan-r>

- Lopez, J. D. (2020). Indigenous data collection: Addressing limitations in Native American samples. *Journal of College Student Development, 61*(6), 750–764.  
<https://doi.org/10.1353/csd.2020.0073>
- Lopez, J. D., & Tachine, A. R. (2021). Giving back: Deconstructing persistence for Indigenous students. *Journal of College Student Development, 62*(5), 613–618.  
<https://doi.org/10.1353/csd.2021.0060>
- Lundberg, C. A., & Lowe, S. C. (2016). Faculty as contributors to learning for Native American students. *Journal of College Student Development, 57*(1), 3–17.  
<https://doi.org/10.1353/csd.2016.0003>
- Lunn, S. J., Bell-Huff, C. L., & Le Doux, J. M. (2022). Learning to care: Faculty perspectives on developing empathy and inclusive mindsets in biomedical engineering. *Biomedical Engineering Education, 2*(2), 123–140. <https://doi.org/10.1007/s43683-022-00077-0>
- Mana, A., Saka, N., Dahan, O., Ben-Simon, A., & Margalit, M. (2022). Implicit Theories, Social support, and hope as serial mediators for predicting academic self-efficacy among higher education students. *Learning Disability Quarterly, 45*(2), 85–95.  
<https://doi.org/10.1177/0731948720918821>
- Mandasini, A. A. (2022). Improving the validity of scientific research results through research methodology management. *Kontigensi :Jurnal Ilmiah Manajemen, 10*(2), 439–447.  
<https://doi.org/10.56457/jimk.v10i2.389>

- Margolis, J., May-Varas, S., & Mead, T. (2022). *Educational learning theories* (3rd ed.). Education Open Textbooks.
- Martorelli, C. B., Eastman, A., Mook, N., Bott-Knutson, R. C., & Arminio, J. (2018). Sunka Wakan: The horse as a partner in welcoming American Indian students to the campus community. *Journal of College Student Development*, 59(6), 749–752.  
<https://doi.org/10.1353/csd.2018.0069>
- Matthay, E. C., & Glymour, M. M. (2020). A graphical catalog of threats to validity. *Epidemiology*, 31(3), 376–384. <https://doi.org/10.1097/ede.0000000000001161>
- Matthews, D. (2021, April 28). *Two-eyed seeing: What we all can learn from Indigenous perspectives on baseball and learning*. Psychology Today.  
<https://www.psychologytoday.com/us/blog/going-beyond-intelligence/202104/two-eyed-seeing>
- Mauldin, R. L., & DeCarlo, M. (2020). *Guidebook for social work literature reviews and research questions*. Guidebook for Social Work Literature Reviews and Research Questions. <https://uta.pressbooks.pub/literaturereviewsforsocialworkresearch/>
- May, A., & McDermott, V. (2021). Invisibility as modern racism: Redressing the experience of Indigenous learners in higher education. *Journal of Communication Pedagogy*, 5, 55–61.  
<https://doi.org/10.31446/jcp.2021.2.09>

- McKinsey, E. (2016). Faculty mentoring undergraduates: The nature, development, and benefits of mentoring relationships. *Teaching & Learning Inquiry The ISSOTL Journal*, 4(1).  
<https://doi.org/10.20343/teachlearningqu.4.1.5>
- McLeod, S. (2023, July 26). *Vygotsky's sociocultural theory of cognitive development*. Simply Psychology. <https://www.simplypsychology.org/vygotsky.html>
- Mehrad, A., Hossein, M., & Zangeneh, T. (2019). Comparison between qualitative and quantitative research approaches: Social sciences. *International Journal For Research In Educational Studies*, 5(7).
- Merculieff, L., & Roderick, L. (2013). *Stop talking: Indigenous ways of teaching and learning and difficult dialogues in Higher Education*. University of Alaska Anchorage.
- Miller, A. C., & Mills, B. (2019). 'If they don't care, I don't care': Millennial and generation Z students and the impact of faculty caring. *Journal of the Scholarship of Teaching and Learning*, 19(4). <https://doi.org/10.14434/josotl.v19i4.24167>
- Miller, A. L., Williams, L. M., & Silberstein, S. M. (2018). Found my place: The importance of faculty relationships for seniors' sense of belonging. *Higher Education Research & Development*, 38(3), 594–608. <https://doi.org/10.1080/07294360.2018.1551333>
- Minthorn, R. S., & Nelson, C. A. (2018). Colonized and racist Indigenous campus tour. *Journal of Critical Scholarship on Higher Education and Student Affairs*, 4(1), 73–88.  
<https://ecommons.luc.edu/cgi/viewcontent.cgi?article=1087&context=jcshesa>

- Minthorn, R. S., & Shotton, H. J. (2018). *Reclaiming Indigenous research in higher education*. Rutgers University Press.
- Mishra, S. (2020). Social networks, social capital, social support and academic success in higher education: A systematic review with a special focus on ‘underrepresented’ students. *Educational Research Review*, 29, 100307. <https://doi.org/10.1016/j.edurev.2019.100307>
- Moore, C. (2019, April 27). *What is appreciative inquiry? (definition, examples & model)*. PositivePsychology.com. <https://positivepsychology.com/appreciative-inquiry/>
- Morales-Rodríguez, F. M., & Pérez-Mármol, J. M. (2019). The role of anxiety, coping strategies, and emotional intelligence on general perceived self-efficacy in university students. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.01689>
- Mosholder, R. S., Waite, B., Larsen, C. A., & Goslin, C. (2016). Promoting Native American retention and recruitment in higher education. *Multicultural Education*. <https://EJ1119399.pdf> (ed.gov)
- Motl, T. C., Multon, K. D., & Zhao, F. (2018). Persistence at a tribal university: Factors associated with second year enrollment. *Journal of Diversity in Higher Education*, 11(1), 51–66. <https://doi.org/10.1037/dhe0000034>
- Mullen, C. A., & Klimaitis, C. C. (2019). Defining mentoring: A literature review of issues, types, and applications. *Annals of the New York Academy of Sciences*, 1483(1), 19–35. <https://doi.org/10.1111/nyas.14176>

- Müller, L., & Klein, D. (2022a). Social inequality in dropout from higher education in Germany. towards combining the student integration model and rational choice theory. *Research in Higher Education*, 64(2), 300–330. <https://doi.org/10.1007/s11162-022-09703-w>
- NABS. (2023, August). *US Indian boarding school history*. The National Native American Boarding School Healing Coalition. <https://boardingschoolhealing.org/list/>
- National Center for Education Statistics. (2020). *Digest of education statistics*. Digest of Education Statistics Home. <https://nces.ed.gov/programs/digest/>
- National Center for Education Statistics. (2022). *Baccalaureate and beyond longitudinal study*. National Center for Education Statistics. <https://nces.ed.gov/surveys/b&b/>
- National Center for Education Statistics. (2022). *Postsecondary students postbaccalaureate enrollment*. Condition of Enrollment. [https://nces.ed.gov/programs/coe/pdf/2022/chb\\_508.pdf](https://nces.ed.gov/programs/coe/pdf/2022/chb_508.pdf)
- National Center for Education Statistics. (2018). *Status and trends in the education of racial and ethnic groups 2018*. <https://nces.ed.gov/pubs2019/2019038.pdf>
- National Center for Health Statistics. (2022). *NHIS-Adult Ssummary health statistics*. Centers for Disease Control and Prevention. [https://wwwn.cdc.gov/NHISDataQueryTool/SHS\\_adult/index.html](https://wwwn.cdc.gov/NHISDataQueryTool/SHS_adult/index.html)
- National Student Clearing House Research Center. (2022). *Persistence & retention*. National Student Clearinghouse Research Center. <https://nscresearchcenter.org/persistence-retention/>

- NCAI. (n.d.). *NCAI policy research center*. National Congress of American Indians.  
<https://www.ncai.org/policy-research-center/research-data/data>
- Nicoletti, M. do. (2019). Revisiting the Tinto theoretical dropout model. *Higher Education Studies*, 9(3), 52. <https://doi.org/10.5539/hes.v9n3p52>
- O'Connor, S. (2020). Secondary data analysis in nursing research: A contemporary discussion. *Clinical Nursing Research*, 29(5), 279–284. <https://doi.org/10.1177/1054773820927144>
- Oxendine, S. D., Taub, D. J., & Cain, E. J. (2020). Factors related to Native American students' perceptions of campus culture. *Journal of College Student Development*, 61(3), 267–280.  
<https://doi.org/10.1353/csd.2020.0027>
- Pannell, A. (2022). Embracing diversity: Immersing culturally responsive pedagogy in our school systems. *Penn GSE Perspectives on Urban Education*, 20(1), 55–60.
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112. <https://doi.org/10.1080/02673843.2019.1596823>
- Paterson, J. (2023). The college experience: What students want today. *Journal of College Admission*, 257, 22–27.
- Peltier, C. (2018). An application of two-eyed seeing: Indigenous research methods with participatory action research. *International Journal of Qualitative Methods*, 17(1).  
<https://doi.org/10.1177/1609406918812346>

- Politi, M., Ferreira, J., & Patino, C. (2021). Nonparametric statistical tests: Friend or foe? *Jornal Brasileiro de Pneumologia*. <https://doi.org/10.36416/1806-3756/e20210292>
- Postsecondary National Policy Institute. (2022, November). *Native American students in higher education factsheet*. PNPI. <https://pnpi.org/factsheets/native-american-students/>
- Pratt, I. S., Harwood, H. B., Cavazos, J. T., & Ditzfeld, C. P. (2017). Should I stay or should I go? Retention in first-generation college students. *Journal of College Student Retention: Research, Theory & Practice*, 21(1), 105–118.  
<https://doi.org/10.1177/1521025117690868>
- Preston, J. P., & Claypool, T. R. (2021). Analyzing assessment practices for Indigenous students. *Frontiers in Education*, 6. <https://doi.org/10.3389/feduc.2021.679972>
- Quaye, S. J., Harper, S. R., & Pendakur, S. L. (2020). *Student engagement in higher education: Theoretical perspectives and practical approaches for diverse populations*. Routledge.
- Rahmatirad, M. (2020). A review of socio-cultural theory. *SIASAT Journal of Social, Cultural and Political Studies*, 4(3), 23–31. <https://doi.org/10.33258/siasat.v4i3.66>
- Rajasekar, J., Al-Asfour, A., & Boomer, H. (2023). Talent development for faculty: The case of higher education minority-serving institutions. *Journal of Faculty Development*, 37(1).
- Ramaley, J. (2014). The changing role of higher education: Learning to deal with wicked problems. *Journal of Higher Education Outreach and Engagement*, 18(3).

- Reindl, M., Auer, T., & Gniewosz, B. (2022). Social integration in higher education and development of intrinsic motivation: A latent transition analysis. *Frontiers in Psychology*, *13*. <https://doi.org/10.3389/fpsyg.2022.877072>
- Ringland, V., Lewis, M. A., & Dunleavy, D. (2021). Beyond the p-value: Bayesian statistics and causation. *Journal of Evidence-Based Social Work*, *18*(3), 284–307.  
<https://doi.org/10.1080/26408066.2020.1832011>
- Rodgers, J. L. (2019). Degrees of freedom at the start of the second 100 years: A pedagogical treatise. *Advances in Methods and Practices in Psychological Science*, *2*(4), 396–405.  
<https://doi.org/10.1177/2515245919882050>
- Rodriguez, A. A., & Mallinckrodt, B. (2021). Native American-identified students' transition to college: A theoretical model of coping challenges and resources. *Journal of College Student Retention: Research, Theory & Practice*, *23*(1), 96–117.  
<https://doi.org/10.1177/1521025118799747>
- Rosado-May, F. J., Urietta, L., Dayton, A., & Rogoff, B. (2020). Innovation is a key feature of Indigenous ways of learning. In *Handbook of the Cultural Foundations of Learning* (pp. 79–96). essay, Routledge.
- Ross, P. T., & Zaidi, N. L. (2019). Limited by our limitations. *Perspectives on Medical Education*, *8*(4), 261–264. <https://doi.org/10.1007/s40037-019-00530-x>
- Ruben, B. D., Lisi, D. R., Gigliotti, R. A., & Lederman, D. A. (2017). *A guide for leaders in higher education: Core concepts, competencies, and tools*. Stylus Publishing.

- Salis Reyes, N. A. (2019). “What am I doing to be a good ancestor?”: An indigenized phenomenology of giving back among Native college graduates. *American Educational Research Journal*, 56(3), 603–637. <https://doi.org/10.3102/0002831218807180>
- Sarol, M. J., Liu, L., & Schneider, J. (2018). Testing a citation and text-based framework for retrieving publications for literature reviews. *BIR 2018 Workshop on Bibliometric-Enhanced Information Retrieval*, 22–33.
- Schmidtke, C. (2009). “That’s what really helped me was their teaching”: Instructor impact on the retention of American Indian students at a two-year technical college. *Journal of Industrial Teacher Education*, 46(1), 48–80.
- Schmidtke, C. (2016). The role of academic student services in the retention of American Indian students at a sub-baccalaureate technical college. *Journal of Career and Technical Education*, 31(1). <https://doi.org/10.21061/jcte.v31i1.1509>
- Schreiner, L. A., Louis, M. C., & Nelson, D. D. (2020). *Thriving in transitions: A research-based approach to college student success*. National Resource Center for The First-Year Experience & Students in Transition.
- Scott, D. (2021). Philosophies of Learning. In *On learning: A general theory of objects and object-relations* (pp. 159–172). essay, UCL Press.
- Seemiller, C., Grace, M., Campagnolo, P. D., Alves, I. M., & De Borba, G. S. (2021). What makes learning enjoyable perspectives of today’s college students in the U.S. and Brazil? *Journal of Pedagogical Research*, 5(1), 1–17. <https://doi.org/10.33902/jpr.2020065267>

- Seeram, E. (2019). An Overview of correlational research. *Radiologic Technology*, 91(2), 176–179. CINAHL Ultimate.
- Semega, J., Kollar, M., Creamer, J., & Mohanty, A. (2019, September 10). *Income and poverty in the United States: 2018*. Census.gov.  
<https://www.census.gov/library/publications/2019/demo/p60-266.html>
- Shotton, H. J., Lowe, S. C., & Waterman, S. J. (2023). *Beyond the asterisk understanding Native students in higher education*. Stylus.
- Shrestha, N. (2021). Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics*, 9(1), 4–11. <https://doi.org/10.12691/ajams-9-1-2>
- Silalahi, R. M. (2019). Understanding Vygotsky's zone of proximal development for learning. *Polyglot: Jurnal Ilmiah*, 15(2), 169. <https://doi.org/10.19166/pji.v15i2.1544>
- Silver Wolf, D. A., Taylor, F., Maguin, E., & Asher BlackDeer, A. (2021). You are college material—you belong: An underrepresented minority student retention intervention without deception. *Journal of College Student Retention: Research, Theory & Practice*, 23(3), 507–522. <https://doi.org/10.1177/1521025119848749>
- Silverstein, L. (2022). Culture at the heart: Cultivating native student success. *Dean and Provost*, 24(1), 7–8. <https://doi.org/10.1002/dap.31083>
- Simi, D., & Matusitz, J. (2022). Improving cultural diversity in U.S. higher education: General perspectives. *International Journal of Social Sciences & Educational Studies*, 9(4), 117–129. <https://doi.org/10.23918/ijsses.v9i4p117>

Sinclair, S. (2020, November 16). *Creating community: Native American student success in the university system*. Tribal College Journal of American Indian Higher Education.

<https://tribalcollegejournal.org/creating-community-native-american-student-success-in-the-university-system/>

Singh, N. K., & Espinoza-Herold, M. (2019). Culture-based education: Lessons from Indigenous education in the U.S. and southeast Asia. *NABE Journal of Research and Practice*, 5(1), 7–39. <https://doi.org/10.1080/26390043.2014.12067773>

Smith, C., & Babich, C. (2021). *Theories of individual and collective learning*.

Smith, W., Forbes, S., Robichaux-Davis, R., & Guarino, A. J. (2020). Self-monitoring as a personality variable in Tinto's theory of integration. *Advances in Social Sciences Research Journal*, 7(1), 406–408. <https://doi.org/10.14738/assrj.71.7702>

Spencer, M. B., Offidani-Bertrand, C., Harris, K., & Valez, G. (2020). Examining links between culture, identity, and learning. In *Handbook of the Cultural Foundations of Learning* (pp. 44–61). essay, Routledge.

Stanforth, A. (2020, September 11). *Why use peer reviewed articles in your research?*. Your Research Journey at Portland State University Library.

<https://pdx.pressbooks.pub/libraryresearchpsu/chapter/chapter-4-find-and-use-peer-reviewed-articles/>

Stevens, C., Liu, C. H., & Chen, J. A. (2018). Racial/ethnic disparities in US college students' experience: Discrimination as an impediment to academic performance. *Journal of*

*American College Health*, 66(7), 665–673.

<https://doi.org/10.1080/07448481.2018.1452745>

Stewart-Ambo, T. (2021). Higher education for California native nation building: A retrospective on college experience and completion. *The Journal of Higher Education*, 92(4), 499–521.

<https://doi.org/10.1080/00221546.2020.1841549>

Strayhorn, T. L. (2018). *College students' sense of belonging: A key to educational success for all students*. Routledge.

Strayhorn, T. L., Bie, F., & Williams, M. S. (2016). Measuring the influence of Native American college students' interactions with diverse others on sense of belonging. *Journal of American Indian Education*, 55(1), 49–73. <https://doi.org/10.1353/jaie.2016.a798950>

Sürücü, L., & Maslakçı, A. (2020). Validity and reliability in quantitative research. *Business & Management Studies: An International Journal*, 8(3), 2694–2726.

<https://doi.org/10.15295/bmij.v8i3.1540>

Sumida Huaman, E., & Abeita, S. (2018). Indigenous teachers and learners: Higher education and social justice. *Anthropology & Education Quarterly*, 49(2), 201–209.

<https://doi.org/10.1111/aeq.12239>

Sumida Huaman, E. A., Chiu, B., & Billy, C. (2019). Indigenous internationalization: Indigenous worldviews, higher education, and tribal colleges and universities. *Education Policy Analysis Archives*, 27, 101. <https://doi.org/10.14507/epaa.27.4366>

- Tachine, A. R., Cabrera, N. L., & Yellow Bird, E. (2016). Home away from home: Native American students' sense of belonging during their first year in college. *The Journal of Higher Education*, 88(5), 785–807. <https://doi.org/10.1080/00221546.2016.1257322>
- Tanujaya, B., Prahmana, R., & Mumu, J. (2022). Likert scale in social sciences research: Problems and difficulties. *FWU Journal of Social Sciences*, 16(4), 89–101. <https://doi.org/10.51709/19951272/winter2022/7>
- Temizhan, E., Mirtagioglu, H., & Mendes, M. (2022). Which correlation coefficient should be used for investigating relations between quantitative variables? *American Academic Scientific Research Journal for Engineering, Technology, and Sciences*, 85(1), 265–277. <https://doi.org/2313-4402>
- Thomas, L. (2023, June 22). *Cross-sectional study: Definition, uses & examples*. Scribbr. <https://www.scribbr.com/methodology/cross-sectional-study/>
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). University of Chicago Press.
- Trolian, T. L., & Parker, E. T. (2022). Shaping students' attitudes toward diversity: Do faculty practices and interactions with students matter? *Research in Higher Education*, 63(5), 849–870. <https://doi.org/10.1007/s11162-021-09668-2>
- Turner, P., & Zepeda, E. M. (2021). Welcoming ain't belonging: A case study that explores how two-year predominantly white colleges can foster an environment of validation and

matter for men of color. *Higher Education Studies*, 11(2), 127.

<https://doi.org/10.5539/hes.v11n2p127>

Turner, S. L., McWhirter, E. H., Lee, H., Mason-Chagil, G., Smith, S., Jacobs, S. C., & Jackson, A. P. (2022). Barriers to stem efficacy and outcome expectations among Native American college students. *The Counseling Psychologist*, 50(7), 981–1008.

<https://doi.org/10.1177/00110000221108454>

UCLA. (2021, April). *Native American and Indigenous peoples faqs*. UCLA Equity, Diversity & Inclusion. <https://equity.ucla.edu/know/resources-on-native-american-and-indigenous-affairs/native-american-and-indigenous-peoples-faqs/>

US Bureau of Labor Statistics. (2020). *Learn more, earn more: Education leads to higher wages, lower unemployment : Career outlook*. U.S. Bureau of Labor Statistics.

<https://www.bls.gov/careeroutlook/2020/data-on-display/education-pays.htm>

US Bureau of Labor Statistics. (2022, January). *Unemployment rate for American Indians and Alaska Natives at 7.9 percent in December 2021*. U.S. Bureau of Labor Statistics.

<https://www.bls.gov/opub/ted/2022/unemployment-rate-for-american-indians-and-alaska-natives-at-7-9-percent-in-december-2021.htm>

US Department of Education. (2022, April 14). *Department of education releases equity action plan as part of Biden-Harris administration's efforts to advance racial equity and support underserved communities*. Department of Education Releases Equity Action Plan as Part of Biden-Harris Administration's Efforts to Advance Racial Equity and Support Underserved Communities | U.S. Department of Education. <https://www.ed.gov/news/press->

releases/department-education-releases-equity-action-plan-part-biden-harris-administrations-efforts-advance-racial-equity-and-support-underserved-communities

US Department of Education. (2021). *White House initiative on advancing educational equity, excellence, and economic opportunity for Native Americans and strengthening tribal colleges and universities*. White House Initiative on Advancing Educational Equity Excellence and Economic Opportunity for Native Americans and Strengthening Tribal Colleges and Universities. <https://sites.ed.gov/whiaiane/>

US Department of the Interior. (2017). *Why are American Indians and Alaska Natives also referred to as Native Americans?* Why are American Indians and Alaska Natives also referred to as Native Americans? | Indian Affairs. <https://www.bia.gov/faqs/why-are-american-indians-and-alaska-natives-also-referred-native-americans>

Uttley, J. (2019). Power analysis, sample Size, and assessment of statistical assumptions—improving the evidential value of lighting research. *LEUKOS*, *15*(2–3), 143–162. <https://doi.org/10.1080/15502724.2018.1533851>

Vable, A. M., Duarte, C. dP, Cohen, A. K., Glymour, M. M., Ream, R. K., & Yen, I. H. (2020). Does the type and timing of educational attainment influence physical health? A novel application of sequence analysis. *American Journal of Epidemiology*, *189*(11), 1389–1401. <https://doi.org/10.1093/aje/kwaa150>

van den Heuvel, E., & Zhan, Z. (2022). Myths about linear and monotonic associations: Pearson's, Spearman's, and Kendall's. *The American Statistician*, *76*(1), 44–52. <https://doi.org/10.1080/00031305.2021.2004922>

- van der Zijden, J. P., & Wubbels, T. (2023). Socio-emotional support in higher education: Evidence from first year learning communities. *Journal of University Teaching & Learning Practice*, 20(6).
- van Zon, S. K., Reijneveld, S. A., Mendes de Leon, C. F., & Bültmann, U. (2017). The impact of low education and poor health on unemployment varies by work life stage. *International Journal of Public Health*, 62(9), 997–1006. <https://doi.org/10.1007/s00038-017-0972-7>
- Verma, J. P., & Abdel-Salam, A.-S. G. (2019). *Testing statistical assumptions in research*. John Wiley & Sons.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wald, N., & Harland, T. (2022). Reconsidering Vygotsky’s ‘more capable peer’ in terms of both personal and knowledge outcomes. *Teaching in Higher Education*, 27(3), 417–423. <https://doi.org/10.1080/13562517.2021.2007474>
- Ward, C., Jepson, S., Jones, K., & Littlebear, R. (2014). Making math count: Tribal college leadership in education reform on the northern Cheyenne reservation. *American Indian Culture and Research Journal*, 38(3), 107–134. <https://doi.org/10.17953/aicr.38.3.xg78874811842n73>
- Waterman, S. J. (2019). New research perspectives on Native American students in higher education. *JCSCORE*, 5(1), 60–80. [https://doi.org/10.15763/issn.2642-2387.2019.5.1.60-](https://doi.org/10.15763/issn.2642-2387.2019.5.1.60-80)

Waterman, S. J., Lowe, S. C., & Shotton, H. J. (2018). *Beyond access: Indigenizing programs for Native American Student Success*. Stylus Publishing, LLC.

Wells, R. N. (1997). *The Native American experience in higher education: Turning around the cycle of failure II*.

Wickham, R. J. (2019). Secondary analysis research. *J Adv Pract Oncol*, 10(4), 395–400.  
<https://doi.org/https://doi.org/10.6004%2Fjadpro.2019.10.4.7>

Wilkie, M. L. (2020). Empowered by cultural identity and catalyzed by resilience: A path to support American Indian nursing student success. *Creative Nursing*, 26(1), 43–47.  
<https://doi.org/10.1891/1078-4535.26.1.43>

Williams, N. (2023, April 6). *How does education affect mental health?* News.  
<https://www.news-medical.net/health/How-does-Education-Affect-Mental-Health.aspx>

Willmott, K. E., Sands, T. L., Raucci, M., & Waterman, S. J. (2016). *Journal of Critical Scholarship on Higher Education and Student Affairs*, 2(1). <https://doi.org/https://ecommons.luc.edu/jcshesa/vol2/iss1/7>

Windchief, S., & Brown, B. (2017). Conceptualizing a mentoring program for American Indian/Alaska Native students in the stem fields: A review of the literature. *Mentoring & Tutoring: Partnership in Learning*, 25(3), 329–345.  
<https://doi.org/10.1080/13611267.2017.1364815>

- Wright, A. L., Gabel, C., Ballantyne, M., Jack, S. M., & Wahoush, O. (2019). Using two-eyed seeing in research with Indigenous people: An Integrative review. *International Journal of Qualitative Methods, 18*, 160940691986969. <https://doi.org/10.1177/1609406919869695>
- Yarbough, J. R. (2018). Adapting adult learning theory to support innovative, advanced, online learning - WVMD model. *Research in Higher Education, 35*.
- Zajacova, A., & Lawrence, E. M. (2018). The relationship between education and health: Reducing disparities through a contextual approach. *Annual Review of Public Health, 39*(1), 273–289. <https://doi.org/10.1146/annurev-publhealth-031816-044628>
- Zhou, M., & Brown, D. (2017). *Educational learning theories* (2nd ed.).

## APPENDIX A

### Slovin's Formula for Sample Size Calculation

This appendix describes the Slovin's formula used in this study explained by Asenahabi and Ikoha (2023) as:

$$n = \frac{N}{1+N(e)^2}$$

Where:

- $n$  is the sample size
- $N$  is the total population
- $e$  is the level of precision

## Appendix B

### Gates Millenium Scholar Survey Instrumentation

This appendix provides a snapshot of the survey variables and results used in this study. The dependent variable in the study includes Native American GMS program recipients and finalists who earned a college degree. Independent variables in this study are professors caring about the student as a person and at least one professor made learning exciting. The following survey data is publicly available for review and download at <https://www.icpsr.umich.edu/web/ICPSR/studies/37665>

**Figure B1**

Row: What is your highest completed level of education Q01\_REC  
 Column: My professors at [QID121-ChoiceGroup-SelectedChoices] cared about me as a person. Q24  
 Control: Which of the following describes your race? You may select one or more. American Indian or Alaska Native Q69\_4

Crosstabulation Data source: <https://doi.org/10.3886/ICPSR37665.v1>

Control Q69\_4: (1) American Indian or Alaska Native

Q24

Q01_REC	1 Strongly disagree (1)	2 (2)	3 (3)	4 (4)	5 Strongly agree (5)	Row Total
HIGH SCHOOL ONLY (1)	N=0 0	0	0	0	0	0
SOME COLLEGE, NO DEGREE (2)	N=1 1	1	5	7	6	20
ASSOCIATE'S (3)	N=1 2	2	2	2	5	12
BACHELOR'S (4)	N=4 14	14	27	47	51	143
POST GRAD (5)	N=6 12	12	34	51	84	187
COL TOTAL	N=12 29	29	68	107	146	362

**Figure B2**

Row: What is your highest completed level of education Q01\_REC  
 Column: I had at least one professor at [QID121-ChoiceGroup-SelectedChoices] who made me excited about learning. Q25  
 Control: Which of the following describes your race? You may select one or more. American Indian or Alaska Native Q69\_4

Crosstabulation Data source: <https://doi.org/10.3886/ICPSR37665.v1>

Control Q69\_4: (1) American Indian or Alaska Native

Q25

Q01_REC	1 Strongly disagree (1)	2 (2)	3 (3)	4 (4)	5 Strongly agree (5)	Row Total
HIGH SCHOOL ONLY (1)	N=0 0	0	0	0	0	0
SOME COLLEGE, NO DEGREE (2)	N=1 2	2	0	2	16	21
ASSOCIATE'S (3)	N=1 1	1	2	2	6	12
BACHELOR'S (4)	N=2 4	4	5	20	114	145
POST GRAD (5)	N=0 4	4	6	22	153	185
COL TOTAL	N=4 11	11	13	46	289	363

## Appendix C

### Data Analysis Formulas

#### Figure C1

##### *Cronbach's alpha Formula*

The Cronbach's alpha formula is used to determine internal consistency for survey reliability (Shrestha, 2021). The following formula is used to determine the survey's reliability:

$$\alpha = \frac{n\bar{r}}{1 + \bar{r}(n-1)}$$

#### Figure C2

##### *Spearman's rank correlation*

The Spearman rank correlation provides insights into linear relationships between two variables (Temizhan et al., 2022). The following formula is used in SPSS Version 29 to calculate this study's variable relationship:

$$r_{sr} = \frac{\sum(R_{ix} - \bar{R}_x)(R_{iy} - \bar{R}_y)}{\sqrt{\sum(R_{ix} - \bar{R}_x)^2 \sum(R_{iy} - \bar{R}_y)^2}}$$


## Appendix D

### ICPSR Dataset Permissions

The following images provide information related to the dataset permissions for the BMGF 2018 GMS 2018 Survey distributed by ICPSR.

#### Figure D1

ICPSR User Support USERS-7901 Public Use Data Question

AM Arun Mathur <jira@icpsr.atlassian.net>  Wed 2/7/2024 3:17 PM  
To: Jessica Bivens

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#### Figure D2

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