

Leveraging Institutional Research to Scaffold Data Sensemaking
and Understanding of Student Equity
Among Community College Administrators

by

Alejandra Villalobos Meléndez

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Approved October 2023 by the
Graduate Supervisory Committee:

Elisabeth Gee, Chair
Kevin Correa
Lisa Jasinski

ARIZONA STATE UNIVERSITY

December 2023

ABSTRACT

Institutional researchers (IRs) at higher education institutions fulfill a crucial role in identifying, processing, and disseminating data to administrators. Identifying effective ways for leaders to make sense of data is essential to advancing the most critical institutional issues, including achieving equitable student outcomes. However, leaders face barriers to effectively interpreting and using institutional data, such as time, tools, and resources. Historically, institutional researchers are primarily quantitative data analysts. Hence, IRs must rethink their roles and fundamentally change their analytical and dissemination processes to effectively support leaders at their institutions. IRs are particularly positioned to engage leaders and facilitate discussions about existing student inequities.

This action research study illustrates how the institutional research function can be leveraged to advance the understanding of inequitable student outcomes among leaders at a community college (Hispanic Serving Institution, small, rural, public 2-year college in Northern New Mexico). The inquiry used Weick's Theory of Sensemaking and the construct of data equity to inform the development of Critical Sensemaking Data Briefs (CSDBs). Specifically, this phenomenological single embedded-unit case study was focused on understanding how senior administrators engage in data sensemaking while participating in the CSDBs.

The study findings support the assertion that IR can be positively leveraged to advance data sensemaking and student equity understanding. Administrators describe their experience engaging in collective data sensemaking and conceptualizing their professional responsibility toward equitable student outcomes. Findings from this study show that engaging in collective data sensemaking expands understanding through

diverse perspectives, added context, and negotiated meaning. Additionally, this action research illustrates how IRs can lead the scaffolding of data sensemaking by providing guidance, context, a structure for dialogue, and the integration of reflection.

DEDICATION

A mis padres.

ACKNOWLEDGEMENTS

To My Family

First and foremost, this achievement would have never been possible without my parents' sacrifices, dedication, and inculcating in me the value of education. I wish you were still here with us, papá. I wish I could see your face at commencement. Mamá, gracias por tu luz y apoyo incondicional. Te amo.

To my daughter, Zoé, you are my motivation, my inspiration, my heart walking about on this earth. I know it has been a challenging journey taking away time from you, and for that, I thank you. I hope you can make all of your dreams come true. I cannot wait to see all of the amazing things you will keep doing.

To my husband, thank you for your ever-present support. It was a long and bumpy road to make this happen, but we figured it out every time. We did it!

To My Colleagues & Committee

To my colleagues, I could not have done this without your generosity and support. I appreciate your willingness to take this leap with me and our collaborative work to serve our community and help our students succeed.

To my committee, Drs. Jasinski and Correa, thank you for your willingness to be part of this journey and for your helpful guidance and feedback. Your input was always clear and actionable, and you made me feel genuinely supported. Your input strengthened my thinking, writing, and the entire inquiry. Your care and support made it a great experience!

To my dissertation Chair, Dr. Gee, I cannot thank you enough for your availability, flexibility, and guidance. For all the weekends and evenings you spent reading and rereading my drafts and always sharing your helpful advice.

Land Acknowledgements

As an ASU student, I acknowledge that the Tempe campus sits on the ancestral homelands of those American Indian tribes that have inhabited this place for centuries, including the Akimel O’odham (Pima) and Pee Posh (Maricopa) peoples.

Similarly, as a part of The University of New Mexico—Taos community, I acknowledge that UNM-Taos sits on the traditional homelands of the Red Willow People of Taos Pueblo. The original peoples of current-day New Mexico Pueblo, Navajo, and Apache since time immemorial, have deep connections to the land and have made significant contributions to the broader community statewide. We honor the land itself and those who remain stewards of this land throughout the generations and also acknowledge our committed relationship to Indigenous peoples. We gratefully recognize our history and work to maintain healthy, fruitful relationships with our neighbors for generations to come.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ix
LIST OF FIGURES	x
CHAPTER	
1 INQUIRY & CONTEXT	1
Larger Context.....	3
Local Context.....	11
Purpose of the Inquiry	22
Summary.....	34
2 CONCEPTUALIZATION OF THE IR PROCESS AND ANCHORING	
THEORETICAL CONSTRUCTS	35
Current Practices & Epistemological Paradigm in IR	35
My Conceptualization of the IR Process.....	37
Anchoring Theoretical Constructs	39
Summary.....	54
3 RESEARCH DESIGN	56
Theoretical Alignment to the Research Design.....	56
The Ladder of Inference & Reflexive Loop.....	58
Photovoice	61
The Innovation	62
Case Study Design	64
Setting & Participants	67
Role of the Researcher	68
Proposed Data Sources	70

CHAPTER	Page
Reporting the Case Study	79
Trustworthiness	79
Summary.....	83
4 DATA ANALYSIS & FINDINGS	84
Data Analysis Process	85
Data Analysis Phase One: Phenomenological Analysis.....	87
Data Analysis Phase Two: Thematic Analysis.....	110
Summary.....	122
5 DISCUSSION & IMPLICATIONS	123
Theoretical Connections	123
Boundaries of the Study.....	127
Lessons Learned.....	129
Implications for Practice	130
Implications for Research.....	132
Closing	134
REFERENCES	136
APPENDIX	
A CRITICAL SENSEMAKING DATA BRIEF PROTOCOL	150
B CSDB OBSERVATION PROTOCOL	153
C INTERVIEW PROTOCOL	155
D PHOTOVOICE PROTOCOL	158
E CSDB No. 6 HANDDOUT PROTOCOL	160
F SHARED MEANING UNITS AND MEANING CLUSTERS	162
G MEANING CLUSTERS AND PORTRAYALS OF EXPERIENCE	164

APPENDIX	Page
H PHOTOVOICE IMAGES AND REFLECTIONS METADATA	166
I SAMPLE OF INVIVO AND VALUES CODES, CATEGORIES AND CLUSTERS .	169
J SAMPLE CATEGORIES AND CLUSTERS	173
K IRB APPROVAL	176

LIST OF TABLES

Table		Page
1.	UNM-Taos Student, Employee, and County Population Demographics	14
2.	Confidence in Data Literacy Among UNM-Los Alamos Administrators	31
3.	Alignment of Weick’s Sensemaking Properties to Theoretical Perspectives	49
4.	Theoretical Alignment to the Research Design	57
5.	Critical Sensemaking Data Briefs Schedule	64
6.	Study Participants	67
7.	Alignment of Research Questions, Propositions, Data Sources, and Analyses ...	78
8.	CSDB Duration and Total Participants	85
9.	Interview Duration and Transcript Quality Before Corrections	87
10.	Responsibility for Advancing Equitable Outcomes: Feelings Reported and Frequencies	105
11.	Thinking About Systemic Outcome Gaps: Feelings Reported and Frequencies	106
12.	Research Questions and Corresponding Portrayals of Experience	108
13.	Alignment of Case Study Propositions and Themes	116

LIST OF FIGURES

Figure	Page
1. Timeline of Selected Key Organizational Changes at UNM-Taos	16
2. IPEDS 150% Graduation Rates	18
3. IPEDS 150% Graduation Rates by Race/Ethnicity	18
4. One-year Retention Rates for First-time, Full-time Students	20
5. One-year Retention Rates for First-time, Full-time Students by Race/Ethnicity	20
6. UNM-Taos within Garcia's Typology of HIS Identities	21
7. The Ladder of Inference with Critical Questions	60
8. The Researcher's Journey Toward the Fusion of Horizons	89
9. Image Submitted by Participant: Color Pencils	100
10. Image Submitted by Participant: Gardener	100
11. Examples of Feelings Leaders Might Feel	103

The real voyage of discovery consists not in seeking new landscapes,
but in having new eyes.

—Marcel Proust, *The Prisoner: In search of lost time*, 1923

CHAPTER 1

INQUIRY & CONTEXT

Introduction

Institutional researchers at higher education institutions fulfill a crucial role in identifying, processing, and disseminating data and information to administrators. As an institutional researcher at a small rural Hispanic-serving college, I collaborate with administrators, faculty, and staff to better understand the student population and the institution's challenges and opportunities. Historically, institutional researchers are primarily quantitative data analysts. However, information dissemination is also critical to institutional research (IR) practice (Saupe, 1990). Institutional researchers must find new eyes and fundamentally change the analytical and dissemination process for discovery and insight to be consequential and meet current challenges in higher education. Institutional researchers must find ways to communicate effectively and efficiently with the campus community, particularly with executive leaders. My inquiry seeks to understand how senior administrators at my institution (a small, rural, public 2-year college in Northern New Mexico) engage in the data sensemaking process, specifically while participating in Critical Sensemaking Data Briefs.

The pace of change and the need to swiftly react to unexpected situations have increased significantly over the last few decades and accelerated in the previous three years due to the COVID-19 pandemic (Levine, 2021; Passerini, 2022). The need to plan for and adjust to change will continue. For example, the 2022 Survey of College and

University Presidents by Inside Higher Ed and Hanover Research found that 72% of chief executives agree that “their institution needs to make fundamental changes in its business model, programming or other operations” (Jaschick & Elderman, 2020, p. 33). The pandemic had numerous ripple effects on instruction and operations. It also continued increased attention to academic and social inequities and the role of education in contributing to social justice (Espinosa et al., 2016; Kirwan, 2016; Nuñez, 2016; Association for American Colleges & Universities, 2018; Office of Civil Rights, 2021). At the same time, technological advancements have resulted in vast amounts of data available. The use of data and pressures to use data to inform decisions have become the norm. However, higher education leaders rely on fragmented and imperfect data to inform decisions. They face barriers such as time, tools, and resources to develop and consume institutional data effectively (Cox et al., 2017).

Optimizing how leaders consume and make sense of data is essential to make the institutional research function more strategic and effective at focusing and advancing improvement efforts on the most critical issues facing the institution and higher education in general. Typically, data and information flow in discrete pieces where a requester asks IR for a particular piece of information needed to be included in a report, proposal, grant-related documents, or specific operational task (e.g., course scheduling, obtaining lists of students, etc.). Infrequently, at small colleges, IR may perform analyses to share with administrators via reports, tables, or graphs. The receiver is left to review and interpret the data based on the reader’s understanding of the issue, the source, and the definition of the data. Data is a resource; its value depends on how it is used (McNair et al., 2020). “Data does not speak for itself. Rather, people must actively make meaning of data and construct implications for action” (Coburn & Turner, 2011, p. 177). Institutional researchers are uniquely positioned to improve how senior leadership at

higher education institutions use data to inform strategic decisions to improve student outcomes.

Larger Context

What Is Institutional Research?

Institutional research has a unique place in higher education. It is presented using different names; its staff is housed in various departments (from the college president's office to information technology departments) and tasked with a broad scope of responsibilities. It is generally an unknown entity or a mystery to most of the campus community. Nevertheless, it is a dynamic and ever-evolving field. Saupe (1990) explains it is "research conducted within an institution of higher education in order to provide information which supports institutional planning, policy formulation, and decision making" (p.1). Institutional research is "concerned with knowledge about a specific institution, or system of institutions, and the generalizability of findings to other settings is not a primary concern" (Terenzini,1999, p. 22).

Institutional research as a recognized area of practice emerged in the early 1960s when the first professional organization, the Association for Institutional Research¹, was established (Terenzini, 1999; Swing, 2009). It has defied a static or clear definition throughout its history as the profession is dynamic, multifaceted, and constantly evolving. Terenzini (1999) conceived institutional research as "institutional intelligence" composed of "three mutually-dependent but distinct forms," which included "technical and analytical competence," organizational and issues intelligence, and "contextual

¹ The Association for Institutional Research remains the largest and most visible professional organization for institutional researchers. <https://www.airweb.org/>

intelligence” (pp. 28-29). A decade later, Swing (2009) argued that the emerging future for institutional researchers was stepping into a role as institutional “change agents” (p. 5). This has become a current necessity and a role that continues to be advocated (Wiley, 2022). Later, in 2016, Swing and Ross extended and redefined the institutional research role as “managing institution-wide data and analytical requirements, and orchestrating “the economics of institutional research” in balancing information supply and demand” (p. 6). Over the last two decades, the demand for data-informed decisions and institutional research services has multiplied as technological advances allowed institutions to collect ever-growing amounts of data, and the demand to speed up the pace to produce analysis to inform decisions also increased (Swing & Ross, 2016b). In the Statement of Aspirational Practice published by the Association for Institutional Research, Swing and Ross (2016a) placed student outcomes at the center of focus for institutional research, calling researchers to embrace and further a “student-focused perspective” and support “smart people to make smart decisions to improve student success” (Swing & Ross, 2016b, p. 3). To summarize, institutional researchers are data analysts and key “change agents” who support decision-makers by illuminating strategic insights (Wiley, 2022, p.1).

Despite these increased pressures and demands on the institutional research function, staff and resources dedicated to these efforts are relatively small, constraining institutional researchers’ ability to meet institutional needs (Swing et al., 2016). Gagliardi and Wellman (2015) note that institutional researchers are commonly “deluged by demands for data collection and report writing that blot out time and attention for deeper research, analysis, and communication” (p. 3). The AIR 2016 National Survey of Institutional Research Offices found that 17% of IR offices at 2-year institutions had a staff of one to less than two FTEs and that during the prior three years,

52% of staff sizes at IR offices “were unchanged...and 14% reported losses in staff positions” (Swing et al., 2016, p. 9). This issue is not unique to 2-year institutions. The survey found similar staffing distributions for 4-year colleges and universities, where 80% of IR offices have less than five staff members (Swing et al., 2016). One of the consequences of having a highly constrained IR resource is that it becomes transactional—campus community members request specific data points for a specific purpose. Another consequence is that data is delivered via passive dissemination methods—emails, workbooks, brief reports, dashboards, or other means limiting explanations and contextualization. As a result, the recipient’s interest in and knowledge of the data become critical factors that significantly affect how information is interpreted. Together, these two practices increase the risk of confusion or misinterpretation. Balancing “the changing landscape of higher education, the impact of evolving technologies, and an insatiable appetite for data to inform management decisions” (Swing et al., 2016, p.4) with limited staff is and will continue to be one of the biggest challenges for IR practitioners in the foreseeable future.

The challenge for IR to provide the necessary data to support decision-makers reaches another level of importance when considering student success and outcomes. Felix et al. (2021) argue that “Offices of Institutional Research (OIRs) find themselves in a central position to identify and address educational inequities faced by racially minoritized students” and call institutional researchers “to reimagine their role within the community college they serve by becoming race-conscious and equity-minded in the ways they articulate their role and function as major hubs of institutional data” (p. 9). As researchers heed the call to take a student-centered perspective, engaging in deeper analysis and understanding differences across student groups becomes imperative.

Furthermore, the authors locate IR as critical in helping close student success gaps. Finally, they urge that institutional researchers take a more active approach in ensuring that decision-makers receive, engage, and carefully interpret data and information and that researchers illuminate differences in equity and how institutions deliver different student experiences for different student populations.

Diversity, Equity, Inclusion, and Belonging in Higher Education

A Brief Historical Overview

Paradoxes in higher education are everywhere; diversity, equity, inclusion, and belonging (DEIB) efforts are no exception. Higher education institutions were created, among other aims, to contribute to developing and maintaining a democratic country in the United States (The Aspen Institute, 2017). At the same time, when first created, universities excluded African Americans, people of color, and women. Universities were places created entirely by and for White males (Center for Social Solutions, 2021). Nevertheless, since the American civil rights movement in the 1960s, colleges, and universities have played a critical role in advancing ideas of social justice and racial equity (Center for Social Solutions, 2021). Like other minoritized communities, the Hispanic community has sought access to quality higher education (Rutgers Center for MSIs, 2014).

Much progress has been gained through legislative efforts. To highlight a few, Title VI of the Civil Rights Act of 1964 prohibited discrimination based on race, color, or national origin in federally funded programs, including colleges and universities (Rutgers Center for MSIs, 2014). A year later, the landmark legislation of the Higher Education Act of 1965, signed by President Lyndon B. Johnson, authorized numerous student and institutional aid programs aimed at minoritized and economically disadvantaged populations (Fountain, 2023). The act has undergone comprehensive

amendments and reauthorizations eight times; the most recent in 2008, provided recognition and support for minority-serving institutions (Fountain, 2023). Examples of widely known programs resulting from this act include Pell Grants and Perkins loans, other federal financial aid programs, TRiO programs, and Title V, which authorizes the Hispanic Serving Institution program (Fountain, 2023). The Americans with Disabilities Act of 1990 prohibits discrimination based on disability and mandates that colleges and universities make reasonable accommodations for students with disabilities (Dragoo & Cole, 2019; Graber, 2022).

Valdez (2015) describes the critical legislative moments between 1972 and 1992 that led to the policies creating Hispanic-Serving Institutions (HSI) federal designation. HSIs are higher education institutions with explicit aims to serve specific underserved student populations in the U.S. Specifically, to be eligible to apply for the HSI designation, institutions must enroll at least 25% of Hispanic full-time equivalent undergraduate students, and 50% must be recipients of Title IV federal aid (U.S. Department of Education, n.d.). Garcia (2019) argues that, in the case of HSIs, these institutions are racially minoritized based on the race of the students they serve and, by extension, are perceived and treated as lower-class institutions. Notably, the HSI designation is solely based on enrollment demographics, not outcomes or the quality of education provided to Hispanic students. Hence, Garcia (2019) also proposes an organizational typology of HSI identities that distinguishes between *Hispanic-enrolling* and *Hispanic-serving* institutions.

Community colleges have played an essential role in expanding access to higher education in the U.S. and thus increasing diversity, equity, and inclusion (Drury, 2003). They serve as a mechanism for upward social mobility and “serve as a ladder for maintaining equity in our communities” (Heelan & Mallow, 2017, p. 19; Schudde &

Goldrick, 2015). Navigating tensions is a hallmark of the history of community colleges. Their creation resulted in unprecedented access to higher education for the vast majority of the population who previously had been denied entry. However, paradoxically, the motivation for their creation was to preserve elitism and highly selective access to universities (Drury, 2003). Today, community colleges continue to provide open and the most affordable access to higher education. They continue to navigate the tension between providing a transfer path to university baccalaureate and vocational programs for direct entry into the labor market. They serve primarily underserved communities (economically disadvantaged and minoritized students). Although the community college is “the first step into or a reentry into the middle class” for many students, it is also “a contested site in which inequality is simultaneously ameliorated by increasing educational opportunity and exacerbated by failing to improve equity in college completion across key demographics, such as race and socioeconomic status” (Heelan & Mellow, 2017, p. 19; Schudde & Goldrick, 2015, p. 28). Latino students enroll primarily in 2-year public institutions (41%), and most Latino undergraduates (54%) enroll at HSIs (Latino Students in Higher Education, 2022).

Despite gaining more access to education and increasing rates of Latino student enrollment in higher education, outcome gaps persist. Among Latino adults, 28% have earned an associate degree or higher, compared to 48% among those who identify as White. Latino students have lower graduation rates for 2-year and 4-year degrees by 5 and 13 percentage points, respectively (iExcelencia in Education!, 2019). New Mexico has the 12th largest Hispanic population. Still, lower graduation rates exist, 5%-points lower for two-year degrees and 9%-points lower for four-year degrees (iExcelencia in Education!, 2023).

As an institutional researcher at a small and rural HSI, it is indispensable to understand the racialization of the students my institution serves and how the historical inequities of educational resources have impacted student academic outcomes and opportunities.

Beyond institutional structures, DEIB reaches every aspect of college life, such as student access, enrollment, and academic outcomes; representation and tokenism of minoritized populations among faculty, staff, and administrators; microaggressions among and across campus populations; and the traumatic experiences of faculty of color in academia to name a few (The Aspen Institute, 2017). For example, little has changed in areas such as representation—only 31% of faculty and 17% of leadership positions are people of color, and those percentages have changed minimally over decades (Center for Social Solutions, 2022).

However, rhetoric and awareness have experienced a surge in the last few years, especially in the aftermath of the racial reckoning of the summer of 2020 as the American society responded to the police murder of George Floyd, an unarmed Black man, followed by the global pandemic (Mitchell & O'Brien, 2020; Office for Civil Rights, 2021; Taylor et al., 2020). DEIB leadership positions have become ubiquitous, and most universities (67%) now have designated diversity officers at senior leadership levels (Center for Social Solutions, 2022). Institutions are allocating and pledging substantial budgets to advance those efforts through dedicated programs and resources allocated for DEIB (Center for Social Solutions, 2022). Many institutions also reference diversity in their mission statement or have additional diversity statements. For example, Wilson et al. (2012) found that 75% of the institutions' mission statements in their sample referenced diversity, and 65% had a separate diversity statement. Higher education leaders are pressured to move from reactiveness and diversity rhetoric to intentionally

enter and lead the conversations about inequitable student outcomes, racial tensions, and violence (The Aspen Institute, 2017).

Institutional Research Role in DEIB

Although scholars and practitioners have identified the role of data in illuminating and addressing equity gaps in educational outcomes, advocacy for transforming the institutional researchers' role “to move beyond their roles of stewards of data to become proactive stakeholders in identifying and addressing educational inequities afflicting racially minoritized students at their home campus” is recent (Felix et al., 2021, p. 9). A decade ago, Dowd et al. (2012) identified institutional researchers as having a unique role in advancing equity at colleges and universities. However, they presented their findings as implications for the future, stating, “the institutional researcher *will be* [emphasis added] a central figure in attempts to integrate data into decision-making and improved practice” and highlighted the “implications for conceptualizing and structuring the institutional researcher role to include a teaching and organizational change function” (p. 211). However, institutional researchers generally still primarily function as suppliers of data, and recent publications continue to advocate for institutional researchers to transform their roles (Felix et al., 2021; Franco & Hernández, 2018; Carmona et al., 2018). In 2020, motivated by the recent visibility of the public discourse about racial injustice in the United States and the inequitable effects of the global pandemic among minoritized college students, the Association for Institutional Research called the profession to be “responsive and relevant” and to “focus on equity” and formally released a Statement on Racial Injustice to express “commitment to advancing diversity, equity, and inclusion in higher education” (Kelly & Keller, 2020, p.10).

This call further advances the AIR’s aspirational statement of being student-centered to advocating for all students. Therefore, researchers should not avoid bringing light to institutional issues of equity and inequitable outcomes. Institutional researchers have a moral and professional responsibility to advance the practice, develop equity-mindedness among practitioners, and become comfortable and proficient at interrogating data with an equity lens. Institutional researchers are particularly positioned to engage leaders and find effective ways to facilitate discussions about existing student inequities among administrators and decision-makers (Dowd et al., 2012; Franco & Hernández, 2018; Carmona et al., 2018; Felix et al., 2021).

Local Context

My professional role is as an institutional researcher at the University of New Mexico-Taos (UNM-Taos), a small rural community college in north-central New Mexico. Below, I briefly describe the institution, the student population, and the institutional research function at UNM-Taos. My action research inquiry is located at UNM-Taos within its organizational context.

The University of New Mexico and the Taos Branch

UNM-Taos History and Current Environment

The University of New Mexico (UNM) is a 4-year public university with a Carnegie classification as R1 (very high research activity) located in Albuquerque, NM (College Navigator, n.d.). UNM has four branch campuses in Gallup, Los Alamos, Taos, and Valencia, along with online and special programs. The University of New Mexico-Taos (UNM-Taos) has an almost century-old history, yet it received status as a branch only two decades ago.

The history of UNM-Taos began in 1923 when the Hardwood Foundation started offering art classes (UNM-Taos Strategic Plan, 2015). Over the next 70 years, through legislative funding efforts and partnerships with existing institutions, educational services, including academic courses, were offered in the region. In 1993, the Klauer family donated 80 acres of land to establish a community college (UNM-Taos Strategic Plan, 2015). Ten years later, in 2003, the organization became an official branch campus of the University of New Mexico under the Branch Community College Act (UNM-Taos Strategic Plan, 2015). Unlike the main campus in Albuquerque, UNM-Taos is a small, 2-year public institution located in the rural north-central portion of the state (College Navigator, n.d.). The institution awards associate degrees and certificates; 11 and 23 programs are available. On average, UNM-Taos grants 160 awards annually, two-thirds of which are associate degrees.

UNM-Taos has two primary sites. The Klauer campus is located in Ranchos de Taos, NM (six miles outside Taos). It is a beautiful, contemporary campus with classrooms, faculty, and staff offices across six buildings. Most associate and certificate programs are housed on this campus. Additionally, the adult education program and Children's campus are located at the Klauer campus. The Civic Plaza Drive site is two blocks north of the historic Taos Plaza. It houses the nursing and health sciences programs.

The institution has experienced much change in recent years. In addition to coping with the COVID-19 pandemic disruptions, in December 2020, the existing chancellor resigned, ending his almost four-year tenure. Over the subsequent seven months, UNM-Taos had an interim chancellor (the chancellor of our sister institution, UNM-Los Alamos). In August 2021, UNM-Taos hired a new permanent chancellor. After arriving, the new Chancellor began changing the organizational structure and

introducing initiatives. As a result of these changes, institutional research is currently a direct report to the Chancellor and a leadership team member. Existing turnover in positions across the institution has continued, but it is stabilizing. Moreover, growth and restructuring have resulted in new positions. Beyond organizational reasons, low housing inventory, high housing prices, and low wages have contributed to the difficulty in attracting and retaining faculty and staff. This organizational state of flux continues as the chancellor enters her third year.

Population Demographics

UNM-Taos is a designated Hispanic-Serving Institution (HSI) that serves primarily underserved populations. The campus is located in a rural and remote area where it is the only higher education institution within a 50-mile radius. The local economy depends on tourism, outdoor recreation, education, government, health care, retail entrepreneurship, construction, and real estate (UNM-Taos Strategic Plan, 2015). Fall enrollment averages over 1,200 students, of which 38% are visiting students—students from the main campus or other branches taking an online course at UNM-Taos on a given term. The racial composition of the student population includes 56% Hispanic, 29% White, and 5% Native American students (Villalobos Meléndez, 2022). The student population is predominantly (66%) female (Villalobos Meléndez, 2022). Among the home student population, 50% are concurrent (high school) students, and 36% are degree-seeking, of which 63% receive financial aid, and 58% are Pell Grant-eligible (Villalobos Meléndez, 2022). Though the student population is relatively proportional to the county population regarding race and ethnicity, it is not in terms of gender, as males are underrepresented (see Table 1). Notably, Native Americans are significantly underrepresented among the staff and not represented among the faculty. Additionally, female and Hispanic staff are overrepresented, as are White faculty. UNM-

Taos has a diverse population and cultures. As an organization, UNM-Taos is proud of its HSI status and benefits financially from the designation as it is a successful competitor in securing federal grants.

Table 1

UNM-Taos Student and Employee and County Demographics

	Students	Faculty	Staff	Taos County
Female	66%	64%	75%	51%
Hispanic	56%	29%	62%	57%
White	29%	57%	34%	30%
Native American	5%		1%	8%

Note. Student, faculty, and staff distributions reflect institutional data. The Taos County distribution is from the 2021 U.S. Census American Community Survey 5-year estimates.

Institutional Research at UNM Taos and My Role

At UNM-Taos, I am the first full-time institutional researcher. As the sole institutional researcher, I am responsible for transforming data into information to support decision-making and planning among executive administrators, faculty, and staff. Before my hiring, a consultant (0.25 FTE) was hired to complete compulsory reporting on an as-needed basis, and existing staff in shared roles provided a minimal supply of data on an ad-hoc basis. Due to the relative newness of this position and the IR function at UNM-Taos, my practice and responsibilities are defining the IR function for the institution.

The IR function at UNM-Taos is in its infant stage. The main UNM campus has a well-established Office of Institutional Analytics (OIA). However, institutional researchers at branch campuses work independently. OIA fulfills some mandatory reporting for branch campuses, such as some of the Integrated Postsecondary Education

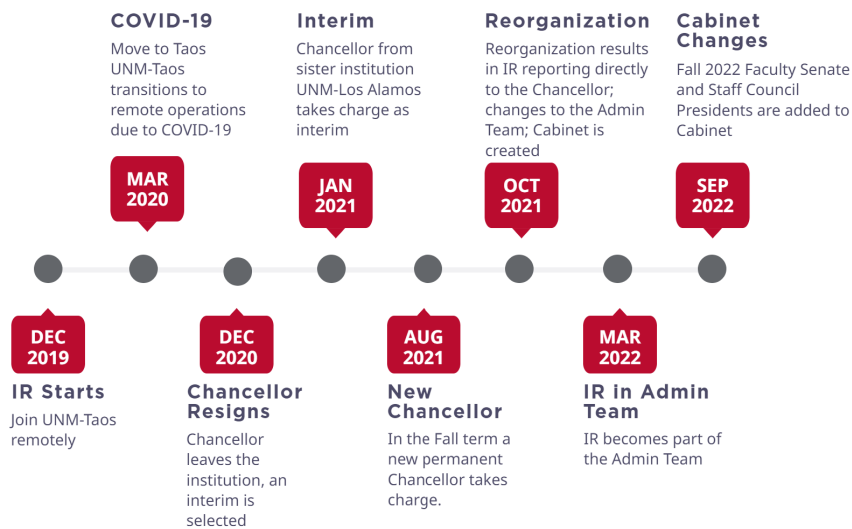
Data System (IPEDS) reporting and reporting to the New Mexico Higher Education Department (NMHED) Electronic Data Editing and Reporting System (eDear). However, OIA provides no oversight, training, or IR coordination across campuses. Institutional researchers are the de facto IR directors for their institutions. The Valencia and Taos branches all have 1 FTE for IR, while Gallup and Los Alamos have 0.5 FTE.

UNM-Taos has experienced leadership transitions, organizational structure, and personnel changes over the last three years (see Figure 1). In December 2019, I joined the institution working remotely. Three months later, as I arrived in Taos, the institution pivoted to remote work and instruction to cope with the COVID-19 pandemic. In addition, leadership changes have meant constant change across the campus, but also for IR. When I was hired, the position was structured to report to the Strategic Support Manager and the Chancellor. In October 2021, two months after the arrival of the new Chancellor, changes to the organizational chart included IR reporting directly and solely to the Chancellor. Additionally, the new Chancellor made membership changes to the executive administration group, internally called 'The Admin Team,' which provides leadership for operational decisions. More recently, in Spring 2022, IR was added to the Admin Team. Another early change the Chancellor made was to create a new body called 'Cabinet' to provide strategic thinking, leadership, and vision for the institution. The Cabinet includes some Admin Team members (the Chancellor, Strategic Support Manager, Dean of Academic Affairs, Director of Student Affairs, Business Manager, and Development Officer) and IR. In Fall 2022, the faculty senate and staff council presidents were added to the Cabinet. Reorganization is likely to continue for some time. When I joined the institution, the former Chancellor gave me the charge to build the IR function at UNM-Taos, grow capacity among staff and administrators, and disrupt the status quo (with data). The new Chancellor also seeks to grow capacity and provide

leadership anchored in research and data. The IR function will continue to grow and mature over the next few years.

Figure 1

Timeline of selected key organizational changes at UNM-Taos



Over the first two years, my efforts focused on establishing routines for mandatory reporting, building relationships across departments, data collection, computing and disseminating traditional IR metrics, developing an institutional survey plan, fulfilling ad-hoc requests, and developing a research agenda. Additionally, IR supports the development of grant proposals and grant reporting. The institution has successfully leveraged its HSI status to access federal Title V and Title III funding. Grants are a significant contributor to institutional funding and are a central mechanism for funding student support services, professional development, and other resources. IR provides essential data to secure grants and fulfill mandatory progress reports.

Student Diversity and Outcomes at UNM-Taos

Despite UNM-Taos being an HSI and having a diverse student population that is racially representative of the community’s population, student outcomes paint a

different picture. Graduation rates for students who complete their program within 150% of standard time show a positive trend over the last five years, with the most recent 2021 rate at 28% (*UNM-Taos IPEDS Data Feedback Report, 2021*). However, the rate is eight percentage points below the 2-year public institution nationwide and New Mexico averages (see Figure 2). Despite closing the gap in graduation rates by gender, the gaps by race are measurable, with White students typically graduating at higher rates. For example, as shown in Figure 3, the 2021 graduation rate for White students was 42%, while Native American and Hispanic students graduated at lower rates of 33% and 22%, respectively (National Center for Education Statistics, 2022). Additionally, graduation rates have not been stable and show considerable variability. This is partly due to the institution's small population, which by nature of the small numbers may reflect as large percentage changes. Traditional student outcome metrics are four-year institution-centric and do not reflect the majority of UNM-Taos students. For example, federal guidelines define graduation and retention rates as calculated based on fall-term first-time, full-time student cohorts. The majority of UNM-Taos students are not first-time or full-time students. In fall 2022, 7% of the total home student population were first-time, full-time students. Therefore, the UNM-Taos graduation and retention rate cohorts represent only a few dozen students (Villalobos Meléndez, 2022). The great majority of UNM-Taos home students are part-time (79%), and notably, 50% of our home students are concurrent students (high school dual credit) (Villalobos Meléndez, 2022). Therefore, the few students reflected in these cohorts to calculate traditional metrics adds to their variability. Nevertheless, UNM-Taos student outcomes have consistently underperformed the state and national averages.

Figure 2

IPEDS 150% Graduation Rates

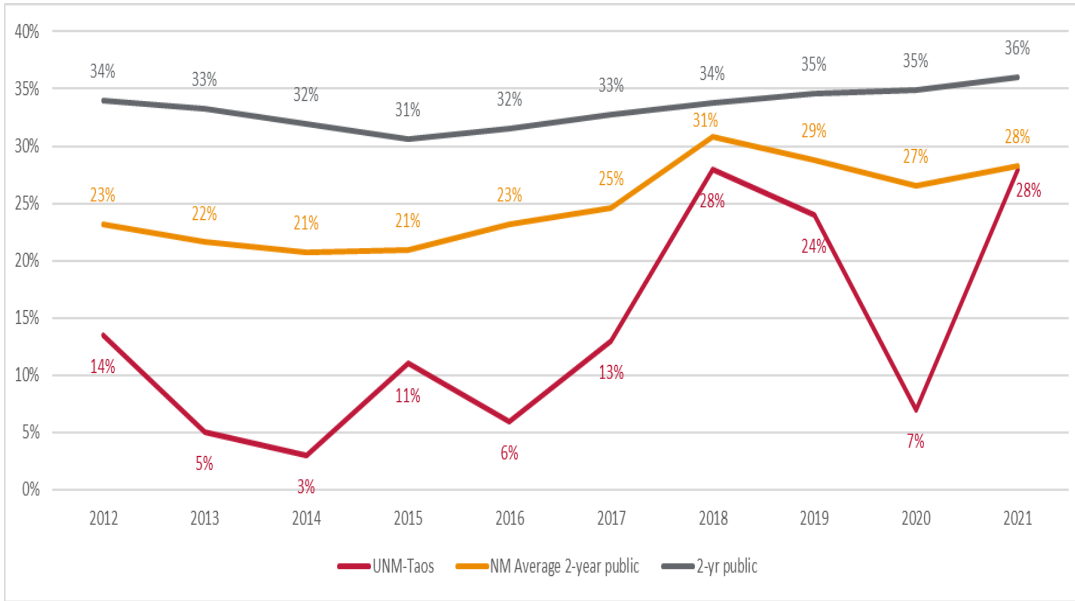
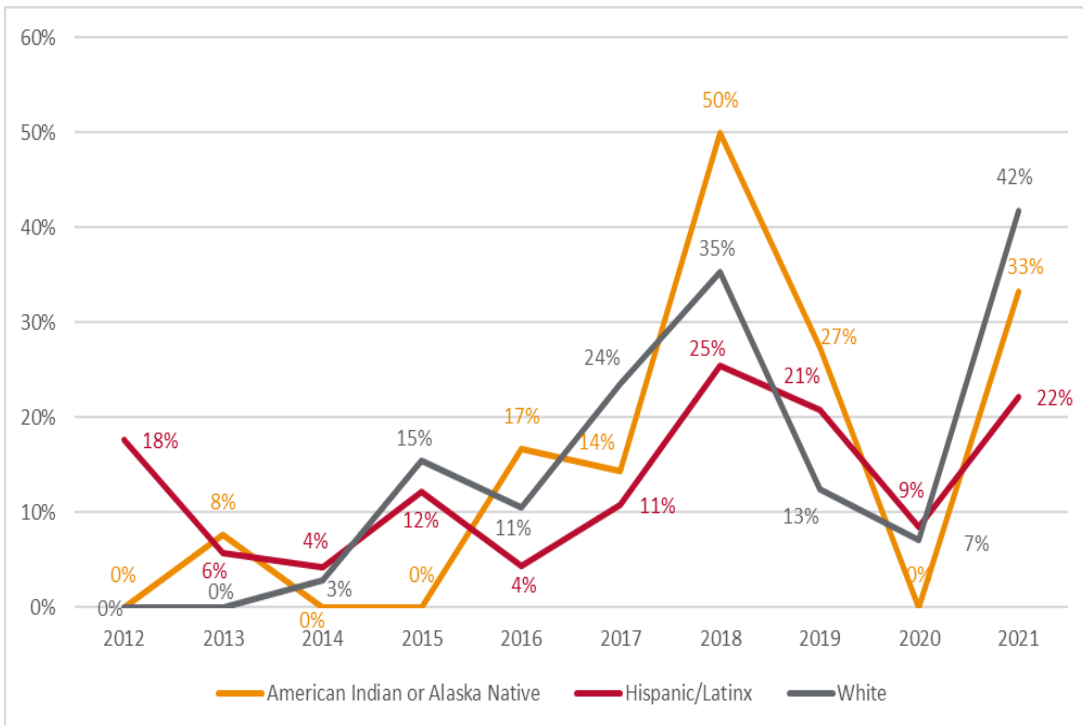


Figure 3

IPEDS 150% Graduation Rates by Race/Ethnicity



Graduation rates are not the only outcome metric where UNM-Taos performs lower than state and national averages. Retention rates at UNM-Taos are typically lower than the national and New Mexico rates for 2-year public institutions (see Figure 4). Examining closely, retention rates by gender have averaged 11 percentage points lower for males than females over the last five years. Differences are also measurable by race and ethnicity. Retention rates for Hispanic students declined measurably between 2018 and 2021 (see Figure 5). The pandemic disproportionately affected students of color and those from economically disadvantaged backgrounds (Shapiro, 2022). At UNM-Taos, this was reflected in the Fall 2021 retention rate, with White students retaining at 43%, compared to 36% for Hispanics and 0% for Native American students. In the Fall of 2022, as the pandemic effects subsided, retention rates appeared to return to normal levels, and there was a narrower gap between White and Hispanic students. Notably, the retention rate for Native American students requires context. Enrollment of first-time, full-time Native American students has decreased by 32% over the last five years, particularly during the pandemic. In Fall 2021, there were only two first-time Native American students and only one enrolled full-time who was still enrolled in Fall 2022. However, the steep enrollment decline among Native American students at UNM-Taos reflects state and national trends (Villalobos Meléndez, 2022).

Figure 4

IPEDS One-Year Retention Rates for First-time, Full-time Students

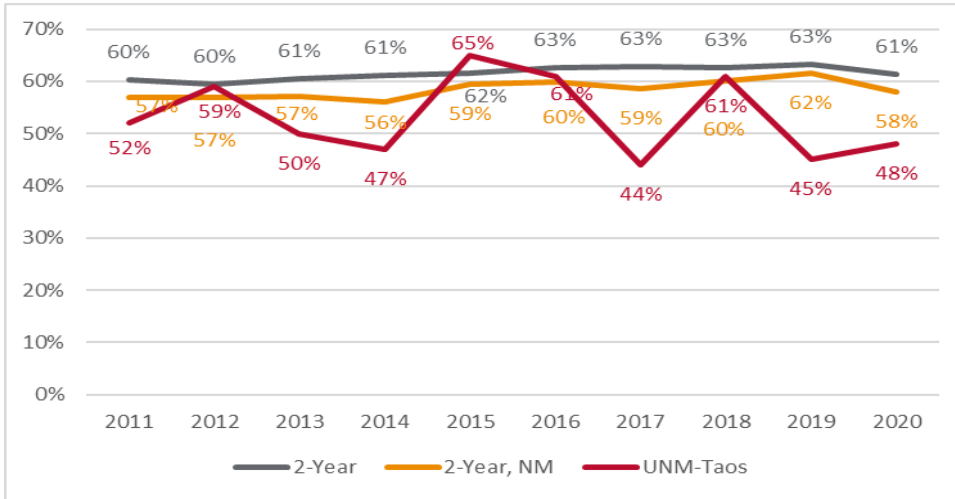
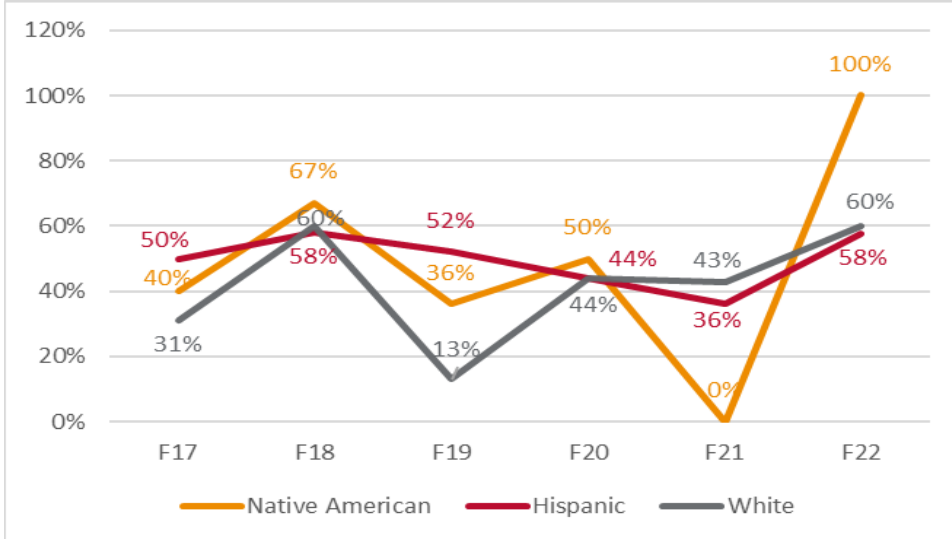


Figure 5

IPEDS One-Year Retention Rates for First-time, Full-time Students by Race/Ethnicity



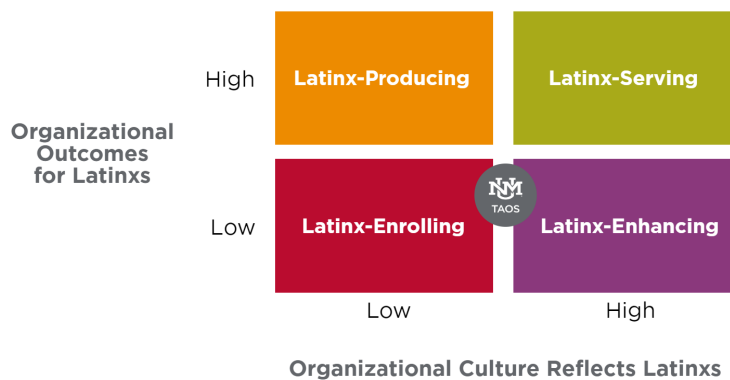
Course completion is critical to student progression and outcomes. One way to examine course success is by analyzing the rate of students who earn grades D, F, and W (withdrawal). Although there are no gender gaps in DFW rates at UNM-Taos, in the Fall

of 2021, White students had a DFW rate of 9%. In contrast, the rate for Hispanic students was almost double (17%), and for Native Americans was more than double (22%).

Therefore, in the case of UNM-Taos, attending an HSI with a student population representative of the community and primarily of people of color (71%) does not translate into equitable student outcomes (Villalobos Meléndez, 2022). The federal HSI designation is based on the share of Hispanic students enrolled at the institution and those who receive federal aid—attained when the institution reaches or passes the threshold of 25% Hispanic (U.S. Department of Education, n.d.). However, Garcia (2019) situates her typology of HSIs by considering the outcomes for Latinx students and the level of culturally relevant practices at the institution. Locating UNM-Taos within Garcia’s framework, the institution is positioned between Latinx-enrolling and Latinx-enhancing, but unequivocally not in the Latinx-serving identity (Figure 6).

Figure 6

UNM-Taos within Garcia’s Typology of HSI Identities



Note: Adapted from Garcia (2019).

Senior leaders and administrators are central in examining institutional policies and systems that lead to success gaps. Because college systems were created and

developed to exclude people of color, “we need to change systems and policies and change the hearts and minds of people who perpetuate unjust systems” (Williams, 2019, p. 3). Data reflect the biases in the systems that generate them, and how data and analyses are presented “play a key role in how inequality is shaped, legitimized, and protected” (Gillborn et al., 2018, p.161). Higher education leaders must be savvy, curious, and critical data consumers to understand and change systems. “Systems are meant to replicate themselves, so if you are not careful, you become blinded by your bright spots and the ways in which your own institution perpetuates social inequities” (Williams, 2019).

Purpose of the Inquiry

In this research, I seek to understand how UNM-Taos senior administrators engage in the data sensemaking process, particularly when quantitative analyses are crafted using a data equity lens and disseminated through team discussion. I posit that integrating an equity-minded lens in the IR analytical processes and actively engaging the institution’s leadership in self-reflection and data sensemaking through group discussion will lead them to consider the equity implications of their decisions more comprehensively. When practices such as highlighting and studying differences in the data by race, engaging in dialogue about the implications of the data, and reflecting on how institutional practices and systems can be modified to improve student outcomes become common and ongoing in the institutional culture, they have the potential to help close the equity gap in student outcomes (McNair et al., 2020).

Other institutions have adopted varied approaches to closing student equity gaps. The University of Southern California Center for Urban Education (CUE) coined the concept of equity-mindedness and has developed a framework and tools to engage in

large institutional change (McNair et al., 2020). CUE highlights the importance of dedicated time and reflection in higher education and the connection to studying disaggregated data and evaluating everyday practices. The Aspen Institute College Excellence Program identified “strategic data use to improve practice and close equity gaps” as one of the five Lessons from the Aspen Prize for Community College Excellence (2014, p. 10). They recommend that “faculty and staff are given structured time and space to meet, analyze, and discuss data on student outcomes” (The Aspen Institute, 2014, p. 46). Similarly, the Community College Research Center at the Teachers College at Columbia University provides guidance for analyzing data “with equity in mind” by studying disaggregated data and having reflective discussions (Fink & Jenkins, 2020, p. 10).

These, however, are examples of large-scale institutional initiatives typically initiated by executive leadership. In contrast, my study explores the data sensemaking process among senior leaders. My inquiry situates institutional research as a starting point for this change process, in which the institutional researcher accepts the role of change agent and equity advocate. The inquiry seeks to provide an example of specific practices of how institutional researchers could pursue these roles, especially those at small institutions in which the IR function faces substantial resource constraints. Carmona et al. (2018) argue that “institutional researchers have profound power in university governance as they operationalize constructs, frame evaluative and research questions, organize and collect data, and disperse analytical findings” (p. 140). They offer a hypothetical example of how an institutional researcher may “promote recognition, interruption, and reparation to change and challenge exclusionary power dynamics in educational settings” that can improve servingness of Latinx students (p.150). My research seeks to explore the real-world implications of this hypothesized proposition by

documenting how senior campus leaders at UNM-Taos make sense of data and demonstrate how IR professionals can integrate equity-mindedness into their practice. Below, I briefly define constructs and theories that inform my inquiry.

Key Concepts

Data Equity & QuantCrit

Data equity refers to using an equity lens to examine how data is collected, analyzed, interpreted, and communicated. It is a label used by practitioners and activists. McNair et al. (2020) use the term “equity-minded data” to discuss the intersection of data and equity and how to advance equity goals in higher education. Equity-mindedness refers to a commitment to reflection and a mental model. McNair et al. (2020) define it as

the mode of thinking exhibited by practitioners who are willing to assess their own racialized assumptions, acknowledge their lack of knowledge of the history of race and racism, take responsibility for the success of historically underserved and minoritized student groups, and to critically assess racialization in their own practices as educators and administrators (p. 20).

The authors also offer three principles of equity:

- Equity is a means of corrective justice (McPherson, 2015) for the educational debt (Landson-Billings, 2006) owed to the descendants of enslaved people and the minoritized populations willfully excluded from higher education.
- Equity is an antiracist project to confront overt and covert racism embedded in institutional structures, policies, and practices (Pollock, 2009).
- Equity lets practitioners see whiteness as a norm that operates unperceived through structures, policies, and practices that racialize the culture and outcomes of higher education institutions (pp. 20-21).

In other words, through reflection and discussion (and informed by data), practitioners consciously examine their biases and assumptions, commit to adapting their practices, and pursue systemic institutional changes to eliminate the equity gap in students' educational access and outcomes. This understanding of equity-mindedness guides this inquiry and innovation design to engage senior administrators in a systematic examination and discussion of student data by race. Similarly, in the academic literature, QuantCrit is a developing subfield of Critical Race Theory (CRT) (Garcia et al., 2018). It refers to applying CRT tenets to quantitative methods (Garcia et al., 2018). It acknowledges that

statistics are socially constructed in exactly the same way that interview data and survey returns are constructed i.e. through a design process that includes, for example, decisions about which issues should (and should not) be researched, what kinds of questions should be asked, how information is to be analyzed, and which findings should be shared publicly. (Gillborn et al., 2018, p. 163)

QuantCrit challenges the perceived superiority and unbiasedness of the quantitative paradigm and seeks to identify ways quantitative methods can be utilized to advance social justice.

Critical Sensemaking

Sensemaking is a theory proposed by Weick (1995) in which he provides a framework to understand how we individually and socially construct meaning (Helms Mills et al., 2010). Weick (1995) identifies seven interrelated properties that interact with each other to create sensemaking. Sensemaking is an active process that exists through experiences, as "Sensemaking enables leaders to have a better grasp of what is going on in their environments, thus facilitating other leadership activities such as visioning, relating, and inventing" (Ancona, 2012, p. 3). Critical sensemaking is a critique and

extension of Weick's theory of sensemaking. Scholars such as Jean Helm Mills and Albert J. Mills expanded the construct of sensemaking into critical sensemaking. They critique Weick's work as incomplete because the seven properties of sensemaking "do not fully explain why some experiences, language, and events become meaningful for individuals while others do not" (Helms Mills et al., 2010, p. 189). Critical sensemaking extends the theory by integrating dimensions omitted from Weick's sensemaking framework: power, language, past relationships, and structure.

My Problem of Practice

Due to the emergent nature of the IR function at UNM-Taos, there is a unique opportunity to build a modern IR function that is not constrained by the traditional model of simply performing "data reporting, which is generally a reactive, transactional activity" (Peters, 2021, p. 1). In this study, I seek to demonstrate how institutional researchers are uniquely positioned to take an active leadership role as essential creators and disseminators of data and information to guide decision-making. In particular, IR can be leveraged to advance equitable outcomes. Beyond providing statistics or ad-hoc analyses, this project seeks to show how IR can lead by example, choose to be guided by QuantCrit principles in its routine practices, and go beyond being a supplier of information. Peters (2021) argues that "as institutional researchers, we hold a plethora of knowledge that would be helpful for our institutions, yet we often find ourselves in positions where we have little authority to actually make change" (p.1). Some of the most salient challenges higher education faces are understanding and advancing diversity, equity, inclusion, and belonging among students, faculty, and staff. I share Swing and Ross's (2016) view that "institutional researchers should be counted on to know and use the discoveries of others in forming a blended view of higher education relevant to real-world, locally-centered problems and opportunities" (p.9). Mitchell and O'Brien (2020)

accurately state that “aspirations for social equity and transformation of students’ lives have been the heart and soul of higher education from its inception...[however], despite idealistic aspirations and concrete progress, inequities in higher education persist.” (p.6). Institutional research has the resources and opportunity to be a meaningful contributor to closing that gap. By evolving and adapting routine IR practices, institutional researchers can develop ‘new eyes’ and ways of seeing and disseminating data that can advance student equity efforts at their institutions.

Therefore, I seek to develop a modern IR function at a small, rural, 2-year institution that 1) guides its operational practices using equity-mindedness and QuantCrit principles and 2) leads with data, providing the space and structure to facilitate active, collective, and guided data sensemaking among senior administrators.

The Innovation

My action research study is designed to assess how engaging in active and collective data sensemaking among administrators guided by IR and integrating the QuantCrit framework into institutional research operations impacts the sensemaking process among leadership. The intervention includes creating Critical Sensemaking Data Briefs (CSDB) where the institutional researcher presents data analyses framed through a data equity lens—providing a structure and time for administrators to review, reflect, interact, and engage in dialogue about the data. All analyses in these data briefs presented data disaggregated by race and gender. These data briefs also included an exercise where participants examined their assumptions and beliefs concerning the data and topic presented. The Critical Sensemaking Data Briefs were embedded in the leadership meetings every other week.

Research Questions

In my role as the institutional researcher at UNM-Taos, I seek to understand senior administrators' data sensemaking. The following questions specifically focus on the learning and experiences of administrators participating in the Critical Sensemaking Data Briefs. To better understand the CSDB experience, this study seeks to address the following:

RQ1. How do senior administrators describe their experiences engaging in group discussion and personal reflection to make sense of data (participating in the CSDB)?

RQ2. How do senior administrators at UNM-Taos describe their professional responsibility in achieving equitable student outcomes?

Exploratory Action Research Cycle

As action research, this study is anchored in the pragmatist paradigm. The traditional action research strand focuses on improving practices and efficiency (Herr & Anderson, 2005). It is a research approach that seeks to solve practical problems while rigorously informed by theory. Combining scientific and organizational knowledge bridges theory and practice (Given, 2008). Some strands of action research, such as critical or participatory action research, aim for emancipatory goals or use “research-as-activism” to achieve social change (Given, 2008, p. 5).

Because action research is an inquiry to identify actionable solutions, it takes a cyclical form (Dick, 2014). The researcher defines a problem, collects data, and researches the literature to identify some interventions to alleviate or solve the problem. Since the research aims to improve the researcher's praxis, it has the defining features of being conducted in the researcher's context and setting. Additionally, the researcher engages in constant reflection. It is a dynamic process that Nofke (2012) describes as

“careful reflection on data from one's practice as the basis for subsequent theorizing and actions.”

Exploratory Research Cycle at UNM-Los Alamos

In this section, I describe my project's exploratory action research cycle. In the reconnaissance phase, I sought to explore data use and perceptions of IR among administrators and benchmark data literacy, given that it conditions an individual's data sensemaking process. This exploratory cycle was conducted during the Fall 2021 term. My local context and unit of inquiry (executive administrators) at UNM-Taos are very small. To preserve the integrity of the inquiry, I conducted the reconnaissance phase at a sister institution, UNM-Los Alamos.

Four research questions guided the cycle:

C1-R1. What is the fluency level among UNM-Los Alamos administrators according to the Data Fluency Inventory? (Scale: basic vocabulary, working knowledge, partially fluent, fully fluent, bilingual)

C1-R2. How do senior administrators define the role of IR on their campus?

C1-R3. To what extent can senior administrators articulate how they review and interpret data (data sensemaking)?

C1-R4. What perceptions do they hold regarding data? (data-equity, QuantCrit related concepts: data as truth, and fixed versus data as socially constructed, interpretative).

The purpose of these research questions was to inform a preliminary conception of the innovation for my problem of practice. The research design followed a concurrent mixed-methods approach (Ivankova, 2015). The quantitative strand entailed conducting a Data Fluency Inventory (DFI)—an existing instrument published in *Data Fluency: Empowering Your Organization with Effective Data Communication* (Gemignani et al.,

2014). It is designed to measure "skills necessary for data fluency" and the value placed "on effective data communication" at the individual and organizational levels (Gemignani et al., 2014, p. 193). Participants included members of the Executive Committee and other faculty and staff in key leadership positions, such as program managers and department chairs. Fifteen of twenty-two administrators consented and responded to all DFI questions. The qualitative strand involved exploratory interviews of three executive leaders identified using a purposeful sample. I sought to interview the most senior leaders and those who make decisions most consequential to the student experience: the Chancellor, the Dean of Academic Affairs, and the Director of Academic Affairs. Below, I describe the insights from the first action research cycle that informed the conceptualization of my innovation.

Theme 1. Administrators are confident in their data literacy but less confident in their data skills. The DFI shows that administrators at UNM-Los Alamos are confident in their data literacy (see Table 2). However, disaggregation by constructs shows that they are least confident in their data skills as consumers (partially fluent, DFI score 71%) and as communicators (authors) of data (partially fluent, DFI score 64%). Similarly, administrators discussed and described their use of data fluidly and in detail but expressed what they perceived as limitations of their data skills. They described themselves as confident in their ability to interpret or understand data presented to them but not nearly as confident in their skills to organize and perform data analyses themselves.

Table 2

Self-reported Confidence in Data Literacy Among UNM-Los Alamos Administrators

DFI category	Percent
Bilingual	7%
Fully Fluent	60%
Partially Fluent	33%

Theme 2. Administrators describe IR in traditional terms but want more from IR. Administrators identify IR as responsible for official reporting and providing information for decision-making. However, participants voiced wishes for an increased and more sophisticated IR resource that engaged in more profound research and supported the contextualization of data and its appropriate use. One administrator expressed it this way: “In our current structure, that person fulfills reporting obligations, but I think the bigger responsibility of IR is to help provide information to strategize and solve problems.” This participant wished that the IR resource was more available to devote attention to not just do baseline functions but to spend time on the research. Asking the questions, answering the questions that are presented externally from the state, but also internally. Moreover, to helps us think of things we never thought of before (Interviewee #1).

Another participant expressed concerns about the typical way in which data and information are delivered.

I think it's important for [IR] to be providing us with data, but I also think, one drawback is that they often only provide the data, and not training in how to use the data. So, I would say that's probably the biggest fault that I have seen...I see very often when institutional research provides data that people then run with

that data without thinking about all of those contexts. And, I think in some respects, that can be as dangerous as having no data at all. And, sometimes, I wish people, especially in higher levels of decision-making, didn't have data since they aren't interpreting it correctly. So, I would like to see institutional research have more of a training arm as well than just pulling the numbers (Interviewee #2).

Theme 3. Administrators articulated their sensemaking as processes and engaging in interpretation. Participants described processes such as relying on their professional knowledge base, identifying “the big picture,” focusing on “the drivers,” questioning the questions and sources of data, and considering contextual factors. For example, one participant said,

I look for consistency. So, if there are results that are coming to me that are inconsistent, the numbers should make sense. If they don't make sense, it's either a problem with the data, or there's something going on that we didn't expect...What's going on and why? So, I guess it's the interpretation of the data that I see is important. (Interviewee #3)

Some acknowledged approaching the data from their lens and discussing findings with colleagues. One participant explained how she benefited from the technical knowledge her professional position provided: “I have a strong understanding of the background and the history about how the data is defined, or how the definitions have changed over time...I'm able to interpret data pretty quickly.” In some cases, their descriptions can be connected to some of the properties Weick's sensemaking theory identified, such as the role of identity, social activity, retrospection, and the ongoing nature of sensemaking. Though respondents describe reviewing data with curiosity and questioning approach, these exploratory interviews did not yield data where the

participants articulated concerns with understanding how data presented are affected by power structures or past relationships (critical sensemaking) or questioning beliefs (ladder of inference).

Theme 4. Administrators could not readily verbalize an understanding of data equity. They hesitated in responding to questions related to data equity and consistently conditioned their responses by stating they did not know or were providing their best ‘guess.’ For example, one respondent declined to respond, saying, “I’ll pass on that one because I have a real clear concept of what equity means in other areas but not when it comes to data” (Interviewee #1). Another participant expressed a lack of understanding in this way: “I assume, with regard to data equity, that’s ensuring that all of the data is equally representative of the different elements that you’re looking at, but I have no idea. I’ve never heard that term before” (Interviewee #3). Respondents could articulate their equity and inclusion efforts and concerns but not as related to data and data analysis. Administrators discussed how they valued data and provided rich examples that supported those claims. They also consistently seemed to include qualitative data in their definition of data and verbalize its importance and value.

The findings from the first action research cycle supported the need and importance of the innovation for this study and the Critical Sensemaking Data Briefs (CSDB). Though interested in and able to communicate their thoughts regarding equity, administrators were unaware and unable to express the connections between data and equity as proposed in the concepts of data equity and QuantCrit. Furthermore, they could readily recognize the IR function as one that produces and shares data and fulfills reporting responsibilities but expressed a desire for their IR function to engage in meaningful research, in-depth analysis, contextualization and interpretation, and support of the sensemaking process. The insights from the first cycle led me to decide on

embedding the CSDBs in the leadership meetings and informed the design of the innovation to include the examination of beliefs and biases and engaging in reflection.

Summary

In this chapter, I provided an overview of my inquiry. I described the need for the role of the institutional researcher to evolve from analyst and supplier of data to one of leadership engaging decision-makers to advance institutional change and support the data sensemaking process. I described the IR function and the need for it to actively play a role in advancing DEIB in higher education institutions. Additionally, I described my local context and how student outcomes for minoritized and underserved students at my institution are inequitable despite being representative of the population, their majority status, and the institution's HSI designation. Furthermore, I briefly described the findings from the initial exploratory phase of my action research, which informed the design of my proposed innovation. In the following chapter, I provide a more detailed discussion of the theoretical frameworks informing my inquiry.

CHAPTER 2

CONCEPTUALIZATION OF THE IR PROCESS AND ANCHORING THEORETICAL CONSTRUCTS

This chapter provides a brief overview of current practices in the IR profession and my conceptualization of the IR process. Then, I review the theoretical constructs informing my inquiry and how they relate to my study. First, I define, describe, and connect the concepts of QuantCrit and data equity. Secondly, I explain the theory of sensemaking and the theoretical extension of critical sensemaking.

Current Practices and Epistemological Paradigm in IR

In Chapter 1, I defined and described the historical progression of the institutional research profession. I briefly overview current practices in this chapter to provide context for my conceptualization of the IR process. The IR practice is deeply anchored in the use of quantitative methods, and that remains today. Qualitative methods remain minimally used in institutional research. Qualitative methods have entered the IR practice mainly in collaborations in assessment and accreditation efforts or through special projects, but not as part of the day-to-day practice. Dowd et al. (2012) explain that “the institutional researcher role has primarily been conceptualized and structured administratively in terms of the knowledge and technical skills required” (p. 193). Commonly, institutional surveys may include open-ended questions, but rigorous qualitative institutional research is still uncommon. Focus groups are infrequently used, and if used, they are used on special projects, but the advocacy for their use in this context continues. For example, Danner et al. (2018) wrote a book, “particularly for...institutional research and assessment staff”, outlining why and how focus groups should be used in the higher education context. Although written almost 30 years ago,

Hathaway's (1995) observations and discussion regarding methodological choices and epistemological consciousness in institutional research are still precisely relevant today. He notes that "often, the driving forces behind the choice of methods are time, money, resources, staff, and those requesting the study" and that "they [institutional researchers] often make their decisions without giving much thought to the assumptions underlying research methods" (Hathaway, 1995, p. 536). Rather than being perceived as a research department, IR is misguidedly seen as an administrative function.

Academic literature on institutional research is limited, and it is even more sparse in the contexts of small or rural institutions or community colleges (Felix et al., 2021; Hernandez et al., 2018; McArthur, 2016). I could identify only one American journal dedicated explicitly to institutional research. The quarterly issue of *New Directions for Institutional Research*, published by Wiley and sponsored by the Association for Institutional Research (AIR), published its last volume in Winter of 2021, marking the end of the publication. AIR currently publishes the AIR Professional File on its website, but it includes only two articles in each biannual release (spring and fall). These articles primarily concern technical procedures or methodological approaches to analyzing time series data, forecasting, or other quantitative-centric topics (e.g., Enrollment projection using Markov chains, published in the Fall 2019 volume). Over the last four years, one case study was published concerning establishing a business intelligence approach at an institution ([Community College Business Intelligence: A Case Study at Lone Star College–Tomball Campus on a Business Intelligence Approach to Community College Challenge](#)).

In 2019, AIR partnered with EDUCAUSE and the National Association of College and University Business Officers (NACUBO) to release "The Joint Statement on Analytics" to "stand together with a strong sense of urgency to reaffirm higher

education's commitment to the use of data and analytics to make better strategic decisions" (p.1). In this statement, data analytics is defined strictly in quantitative terms: "Analytics is the use of data, statistical analysis, and explanatory and predictive models to gain insight and act on complex issues" (p. 1). Current trends consider 'big data' as the frontier for higher education. It is also important to note that large, four-year institutions drive trends and narratives about institutional research. These institutions have larger datasets, staff, and technological and software resources.

Due to its origin, history, and the formal and professional education of its staff, positivism is the defacto epistemological approach in institutional research. As Hathaway (1995) posited, "institutional researchers tend to rely on empirical-analytic research more regularly. The reasons for the preference for empirical-analytic research are elusive" (p. 554). Nevertheless, "the choice embodies not a simple decision between methodologies, but an understanding of the philosophical assumptions concerning reality, the role of the researcher, what is knowledge, and what are data" (Hathaway, 1995, p. 555). Therefore, institutional researchers must concern themselves with aspects of the institutional research practice beyond statistical procedures and technicalities.

My Conceptualization of the IR Process

Institutional research (IR) can potentially engage senior administrators in examining their understanding of inequitable student outcomes and support the sensemaking process to lead institutional change, as described in Chapter 1. Hence, IR practices are of consequence because they can define or reframe institutional conversations (Carmona et al., 2018; Hernández et al., 2018). In transforming data into information, the researchers make decisions that directly shape the information produced, albeit within constraints (Gillborn et al., 2018; Crawford, 2019).

Nevertheless, as other researchers do, institutional researchers decide whether or not to pursue an inquiry and when to pursue it. As institutional researchers study a question, they decide what data is essential and how it enters the inquiry. Institutional researchers also make decisions about the analysis process. Once findings are constructed, institutional researchers decide how to deliver the findings, when to share the information, and with whom. Therefore, through these decisions, IR directly contributes to the sensemaking process. The institutional research function engages its potential to lead by attending to and modifying its practices. The data-to-information transformation and information delivery processes are two areas where this potential is most significant. By organizing, processing, integrating, summarizing, and analyzing data, researchers create information and identify actionable strategic insights that can improve decision-making. Nevertheless, this information must be delivered effectively to actualize the potential of improving decision-making. Accordingly, the intervention in this inquiry seeks to modify the transformation and delivery processes.

First, the data-to-information transformation process will be adjusted by integrating a QuantCrit/data equity lens as the researcher produces content. Then, the information delivery process will be modified by creating a defined space and structure for consuming information and engaging in dialogue as part of the sensemaking process. In short, this is operationalized by establishing a preference for active and contextualized delivery means rather than passive transfer of information. Consequently, IR will adjust its practices to modify the data ecosystem for administrators, intentionally contributing to the sensemaking process. These adjustments will be intentional and aimed not solely to contribute to the sensemaking process but to advance institutional goals toward equitable student outcomes to advance ‘servingness’ to move beyond simply enrolling a large number of Hispanic students. Garcia (2019, 2023) conceptualizes ‘servingness’ as a

complex approach where institutions rethink their processes, programs, and institutional culture to serve the specific Hispanic students they have intentionally.

Anchoring Theoretical Constructs

Quantitative Critical Race Theory

Critical Race Theory originates in critical legal studies literature (Ladson-Billings, 1998). CRT offers a set of five tenets to serve as a framework for analyzing inequities in policies and societal structures due to differences in race. The tenets are “counter-storytelling; the permanence of racism; Whiteness as property; interest conversion; and the critique of liberalism” (Hiraldo, 2010; Ladson-Billings, 1998). CRT starts with the premise that racism exists through institutionalized policies, social structures, and norms. Educational scholars and researchers use CRT as an analytical tool to illuminate educational inequities for various groups of students in a wide range of topics such as policy, funding, assessment, academic outcomes, curriculum, and more (Hiraldo, 2010; Ladson-Billings, 1998; Ladson-Billings, 2006; Gillborn, 2005; Solorzano & Yosso, 2002). As the use of CRT has expanded in the research literature to focus on specific groups or issues, several subfields have emerged, such as Latino CRT (LatCrit) (Bernal, 2002), Disability Critical Race Studies (DisCrit) (Annamma et al., 2018), American Indian Critical Race Studies (TribalCrit), among others (Viramontes, 2021). In the academic literature, a recent and emergent CRT subfield is Quantitative Critical Race Theory (QuantCrit) (Garcia et al., 2018). Despite being a relatively new term, efforts to use quantitative data for social justice aims are not new and can be traced back to the late 1800s in W.E.B. DuBois’ study of race in a Black community in the U.S. (DuBois, 1899; Morris, 2015). QuantCrit refers to applying CRT tenets to quantitative methods (Garcia et al., 2018). Gillborn et al. (2018) discuss the issues of claiming

quantitative data and quantitative methods as ‘truth.’ They provide specific examples of how ‘big data’ can serve as a tool for perpetuating inequity and racism. They show how “computer-generated quantitative analyses embody human biases...[and how] they also represent the added danger that their assumed objectivity can give the biases enhanced respectability and persuasiveness” (p. 159). Moreover, they argue that “numbers play a key role in how inequality is shaped, legitimized, and protected” (p. 161). The authors challenge the perceived superiority and unbiasedness of quantitative approaches because analysts and researchers make design decisions and decide the issues that should be analyzed or not, the methods used, and what, when, how, and with whom to share findings publicly, Gillborn et al. (2018) argue that statistics are, as qualitative methods are, socially constructed.

Furthermore, Gillborn et al. (2018) propose a set of first QuantCrit principles to help move towards a critical race theory of statistics:

- 1) the centrality of racism,
- 2) numbers are not neutral,
- 3) categories are neither ‘natural’ nor given: for ‘race’ read ‘racism,’
- 4) voice an insight: data cannot ‘speak for itself’,
- 5) using numbers for social justice (p. 168, 175).

The centrality of racism anchors an understanding that most systems and institutions are designed to perpetuate the dominant majority’s privilege. Therefore, the analyst must identify and understand when and where “misrepresentations of quantitative data are at the heart of an institutional process through which race and racism are produced, legitimized, and perpetuated in education” (Crawford, 2019, p. 423). Race is not a discrete variable that can be quantified or measured; it is a complex social process (Crawford, 2019; Gillborn et al., 2018). Hence, researchers should actively

seek the varied ways racism can manifest in the data. For example, are high dropout rates among Native American students interpreted as inadequate academic preparation or interest? Or, are they interpreted as a systemic misalignment of the academic calendar conflicting with important traditional or religious observances in their communities or conflicts with wildlife and agricultural harvesting for subsistence Native communities?

The concept of understanding ‘numbers as not neutral’ guides the researcher to examine how data collection and analysis processes that yield these numbers may have relied on assumptions that protect and perpetuate privilege for the majority (Crawford, 2019; Gillborn et al., 2018). For example, data identifying low-income and first-generation students are rarely collected comprehensively and systematically. These are strategic data that lower-resourced schools rely on to compete for grant funding to fund student services and academic support. However, in most cases, proxy variables such as Pell Grant eligibility or self-reported data are used. It is common for first-generation data to be poor estimations and extrapolations of self-reported data in admissions applications or institutional surveys. Furthermore, the label of first-generation is defined differently by different institutions or agencies. This commonly results in poor underestimations of the share of underserved students institutions are trying to support. Hence, whether through funding formula mechanisms or grant competitions, insufficient funding continues to be provided to institutions that serve these populations. Since larger or wealthier institutions are not as meaningfully dependent on those funding sources, broad or systemic solutions to improving these data collection and accuracy tend to fall under lower priorities.

Categories are constructed, not naturally determined. Institutional and social norms inform the crafting of labels used in quantitative research to organize and analyze social data. These labels originate within a historical context and may be contested.

Researchers must examine and question the terms they choose to use and the criteria they use to set boundaries (Crawford, 2019; Gillborn et al., 2018). For example, Teranishi (2007) shows how a broad grouping of Asian students in a single category obscures the reality of student outcomes and perpetuates inaccurate stereotypes. Data cannot “*speak for itself.*” Social statistics are interpretative information. For example, Gillborn et al. (2018) explain how “racism does not operate separately to factors such as prior attainment, income, and maternal education. Racism operates through and between many of these factors simultaneously” (p. 173). Hence, quantitative data analysis should be informed to the extent possible by the experience of the minoritized groups. Hence, quantitative data cannot live in isolation. Qualitative data and methods must be integrated to support a more accurate design and interpretation of quantitative data and to provide a voice for the marginalized populations the data seeks to depict.

Rather than rejecting quantitative approaches as flawed, the researcher acknowledges their use and prevalence in shaping policy and decisions. Instead, the researcher commits to using quantitative data from an anti-racist stance to help illuminate inequities and advocate to correct them.

Data equity is a label used by practitioners and activists, whereas QuantCrit reflects the discourse and label used by academics. Data equity refers to using an equity lens to examine how data is collected, analyzed, interpreted, and communicated. McNair et al. (2020) use the term ‘equity-minded data’ to discuss the intersection of data and equity and how to advance equity goals in higher education. The authors suggest actions like purposeful disaggregation but go beyond to outline “effective approaches and tools to use data to make equity gaps visible and encourage equity-minded sensemaking and action by practitioners”, such as highlighting their work with the University of Southern

California Center for Urban Education and the development of the Equity Score Card (McNair et al., 2020, p. 54). Purposeful disaggregation is not only about identifying data by demographic and socioeconomic characteristics like gender, race, or income. It also includes routinely and intentionally highlighting areas of disparity and leaning into intersectionality to deepen insights. Disaggregation is the first step because it makes gaps visible. Equity is thus achieved when minoritized students reflect proportional participation and outcomes (McNair et al., 2020). Additionally, McNair et al. (2020) argue that reviewing or analyzing the data “is insufficient” and that equal focus should be placed on “the process during which practitioners reflect on and make sense of data to inform their actions” (p. 54).

QuantCrit/Data Equity in Higher Education

Education has been a primary field through which QuantCrit emerged. Crawford (2019) describes QuantCrit as an “emerging quantitative sub-field of Critical Race Theory in education” (p. 423). It has been primarily applied to large sets of educational outcomes data in various countries. For example, QuantCrit has been used to examine educational attainment data in England (Crawford, 2019; Warmington, 2014; Gillborn, 2008), intersectionality and educational pipeline of Chicano/ students in the U.S. (Covarrubias, 2011), including using mixed methods approaches (Covarrubias et al., 2018); intersectionality and educational outcomes in the U.S. for Southeast Asian female college students (Jang, 2018); achievement gaps of college students in the southwest U.S. (Lopez et al., 2018); the value of a college degree for Latinx students beyond economic returns (Pérez Huber et al., 2018); and the role of sociopolitical context in ethnic identification among college students in the southern U.S. (Ramos et al., 2021) to name a few.

Others have engaged in this work without using the explicit QuantCrit label. Pre-dating the term, Teranishi (2007) describes how typical quantitative ways to study race lead to misrepresentation and inaccurate conclusions. He uses his research on Asian American higher education student outcomes to illustrate the issue. He argues that quantitative analyses benefit from having CRT “inform, guide, and design quantitative research on race in higher education” (p. 46). Covarrubias Velez (2013) describes using the CRT framework to inform, design, and guide quantitative research in education. More recently, Sablan (2019) used CRT and quantitative methods to quantify undergraduate students’ community cultural wealth.

Advocacy for using CRT to inform quantitative work continues. Schudde (2018) reviewed methodologies that can be used to incorporate the concept of intersectionality into quantitative analysis. Intersectionality is an analytical tool and a way to understand complexity in our social systems where individuals are understood to be subject to ‘axes of social division’ such as race, gender, class, ability, and many others. These dimensions are not singular but combine and compound to manifest differently for individuals (Hill Collins & Bilge, 2016). Schudde argued that to improve the exploration of intersectionality using quantitative data and approaches, researchers must engage in “breaking down silos that keep education researchers with similar interests—but different methodological approaches—from sharing knowledge” (p. 73). Curley (2019) expands and posits how QuantCrit can be applied to the studies of the college LGBTQIA community and proposes a framework to encourage researchers to blend paradigms into a Third Space, in which the First Space (objective/quantitative) and Second Space (subjective/qualitative) merge so that “positivistic and critical theories of space can be combined and recombined in infinite ways” (p.171).

QuantCrit and data equity application in the study

For this study, I consider QuantCrit and data equity parallel terms that guide my inquiry in two ways. First, it brings a conceptual understanding of quantitative methods as socially constructed and the role of the researcher during the analytical processes. Second, it guides the first step of the intervention, arguing that it is possible and necessary to apply a critical race theory lens to quantitative methods to reimagine and rectify quantitative methods (Garcia et al., 2018). By acknowledging the role of the researcher in the analytical process, this awareness can help the researcher make conscious analytical decisions that are not purely technical but also informed by social and ethical consciousness. Furthermore, the QuantCrit principles provide a framework to guide how institutional researchers can operationalize the call to “focus on equity” and the “commitment to advancing diversity, equity, and inclusion in higher education” (Kelly & Keller, 2020, p. 10). It provides a general map for how to engage with the data in a way that highlights inequities and can help identify systemic processes within the institution that are counterproductive to the institutional goals. Moreover, the data equity process, as conceptualized by McNair et al. (2020), guides the impetus for engaging administrators in dialogue and a reflective process that allows them to “ask themselves how their own practices create or exacerbate inequities in outcomes apparent in the data” (McNair et al., 2020, p. 54). This understanding guides the intervention as I seek to provide opportunities for active data sensemaking during the Critical Sensemaking Data Briefs. These aims are not outside the scope of institutional research. As Felix et al. (2021) urge, IR offices “are a critical department in community colleges to advance racial equity goals, but their articulated purpose and traditional functions minimize their role in being active participants in identifying and dismantling inequities on campus” (p. 10).

Sensemaking

Weick's sensemaking framework

The theory of sensemaking is a framework proposed by Karl Weick (1995) in which he describes the individual and organizational processes of interpreting and creating an understanding of our reality. Sensemaking is an active process that emerges through experiences. "Sensemaking enables leaders to have a better grasp of what is going on in their environments, thus facilitating other leadership activities such as visioning, relating, and inventing" (Ancona, 2012, p. 3).

Weick (1995) recognizes interpretation as part of the sensemaking process but separates the two concepts. He writes, "the key distinction is that sensemaking is about the ways people generate what they interpret...a focus on sensemaking induces a mindset to focus on process" (p. 13). Moreover, sensemaking involves creation; it "is about authoring as well as interpretation, creation as well as discovery" (p. 8). The sensemaking process is the act of giving meaning to a reality or action by processing all the data and information around you until it becomes sensible and allows you to make decisions. It is an ongoing and dynamic process.

Weick (1995) defines seven interrelated properties of the sensemaking process. These sensemaking properties provide an analytical tool for understanding "how and why different people can give the same event different meaning" (Helms Mills et al., 2010, p. 3). The sensemaking properties are (Weick, 1995, p. 17):

1) Grounded in identity construction - we are constantly adjusting our identity.

How we think of ourselves or place ourselves in a particular situation informs how we make sense of it and the decisions we make.

2) Retrospective - sensemaking is about giving meaning to action; however, that can only happen after the experience has occurred. Hence, it is reflecting and

giving meaning to lived experiences. It may be experienced as a flow while going through it (Nardon & Hari, 2022).

- 3) Enactive of sensible environments - The environment is a source of cues and stimuli. The individual senses and responds to the environment; as she does, she also contributes to making the environment. Therefore, it is a reciprocal relationship.
- 4) Social - Our meaning-making processes are “influenced by the actual, *imagined* or *implied* presence of others” (Allport, 1985, as cited in Weick, 1995, p. 39)
- 5) Ongoing - Sensemaking is constantly incorporating additional information and continuously readjusting.
- 6) Focused on and by extracted cues - We selectively extract and connect pieces of information to interpret and create meaning.
- 7) Driven by plausibility rather than accuracy - In the process of making sense, we eliminate or distort a datum or cue. In order to give meaning, we sort, reduce, and organize information in a way that is conceivable or that we deem feasible. This property helps explain why two people in the same situation may react differently or come to different conclusions when presented with the same information.

Maitlis and Christianson (2014) identified a dozen forms of sensemaking in their review of the sensemaking literature (constituent-minded, cultural, ecological, environmental, future-oriented, intercultural, interpersonal, market, political, prosocial, prospective, and resourceful sensemaking). Nevertheless, Koesten et al. (2021) highlight that “the behaviors involved in datacentric sensemaking” have received minimal investigation (p.1).

Two additional sensemaking-related constructs are *sensebreaking* and *sensegiving*. Sensebreaking relates to “the destruction or breaking down of meaning” (Pratt, 2000, p. 464). Sensegiving relates to “attempting to influence the sensemaking and meaning construction of others toward a preferred redefinition of organizational reality” (Gioia & Chittipeddi, 1991, p. 442). These constructs can help institutional researchers become more effective. In order to highlight and explain student equity issues at the institution, an institutional researcher might utilize data and analysis to create a sensebreaking of institutional narratives based on anecdotal evidence or personal opinions of an issue. Additionally, IR can support leadership by employing sensegiving based on data to redirect attention and efforts to critical areas and by providing the necessary context to make the use of information more effective and aim toward change (as in the hypothetical example described on page 23 offered by Carmona et al., 2018).

Weick’s sensemaking theory has social constructivism as a foundation (Helm Mills et al., 2010). Hershberg (2014) defines the constructivist paradigm as “a view of human beings as actively constructing knowledge, in their own subjective and intersubjective realities and in contextually specific ways” (p. 2). Within the constructivist paradigm, hermeneutic constructivism is salient to my inquiry. Per hermeneutic constructivism, “knowledge is a product of language and meanings developed through activity within a community, group, culture, and society” (Hershberg, 2014, p. 5).

Reviewing Weick’s (1995) seven sensemaking properties, there is significant alignment with social constructivism (see Table 3).

Table 3*Alignment of Weick's Sensemaking Properties to Theoretical Perspectives*

Weick's Sensemaking Properties		Aligned with
1.	Identity	
2.	Retrospective	Hermeneutics
3.	Focused on and extracted by cues	Social constructivism
4.	Plausibility over accuracy	Social constructivism
5.	Enactive environment	Social constructivism
6.	Social	Social/hermeneutic constructivism
7.	Ongoing	Social constructivism

Gergen (1985) explains that social constructionism “is principally concerned with explicating the processes by which people come to describe, explain, or otherwise account for the world (including themselves) in which they live” (p. 266). Therefore, in social constructionism, “the study of social processes could become generic for understanding the nature of knowledge itself” (p. 267). People’s understanding of the world and their knowledge base emanate from interacting with others within a specific time and place (Burr, 2003; Gergen, 2015).

A key concept in hermeneutic constructivism that does not appear as prominent among Weick’s seven properties is the role of language. Studying the role of language in the interactions of the leadership team as it relates to their data consumption would be insightful to my inquiry. Hence, hermeneutic constructivism, through its emphasis on understanding the use of language in creating meaning and knowledge, is vital.

Language is a critical tool to make meaning of our experiences and process information

(Van Manen, 2016; Koesten et al., 2021). For example, Koesten and coauthors (2021) show that even among seasoned researchers and data professionals, collaboration and discussions with others are critical aspects of deeply engaging with data and placing it into broader contexts, which they identify as crucial patterns of activity in the data-centric sensemaking process.

Critical sensemaking

Helms Mills and Mills critique and extend Weick's theory of sensemaking into critical sensemaking. Helms Mills et al. (2010) critique Weick's conception of sensemaking as it does not illuminate "why some language, social practices, and experiences become meaningful for individuals, and others do not" (p. 188). Hence, Helms Mills and Mills expand the framework into critical sensemaking, which incorporates attention to the role of language, power, past relationships, and structure.

Helms Mills (2003) underscores how interpersonal, sociocultural, and institutional contexts impact sensemaking and recognizes the influence of differences in power. Critical sensemaking links dominant social values and individual action through the formative context (Helms Mills et al., 2010). The authors argue that identity does not only influence individual sensemaking, but it also influences "how individuals understand the other six properties" (p. 188). According to them, sensemaking is a framework researchers can use to understand "the process of structuration and the discursiveness of discourse" because of its explanatory properties. In contrast, "critical sensemaking has the potential for social change" (p. 193). Critical sensemaking can help analyze how the sensemaking process among individuals and the organization changes due to an event or other significant change (Mills et al., 2010). For this study, the event potentially affecting the sensemaking process is the innovation designed for this study, the Critical Sensemaking Data Briefs.

These perspectives align well with my inquiry into data sensemaking and the innovation's aim of seeking to affect the sensemaking process by providing a time and space for knowledge and meaning co-construction among senior leadership. McNair et al. (2020) argue that beyond the traditional means of data dissemination, "equally important...is the process during which practitioners reflect on and make sense of data to inform their actions. Simply consulting or examining data is insufficient" (p. 54). This directly relates to the hermeneutic constructivist understanding that knowledge is produced through communal activity, the importance of language, and the negotiation of language in the process of ascribing meaning (in this case, to data). Providing alternative processes to engage in collective data sensemaking can allow different meanings, knowledge, and sensemaking to emerge. This understanding is at the core of my inquiry and innovation.

Sensemaking literature in higher education

Literature on sensemaking in higher education continues to grow. Sensemaking has been used across industries as a conceptual framework for understanding emergencies, unexpected events, organizational processes, and change. Thus, most sensemaking literature is found in organizational theory, management, and leadership (Maitlis & Christianson, 2014). Nevertheless, sensemaking has been used as an analytical framework in several areas of study in higher education.

In the education literature, researchers lean on the theory of sensemaking when examining change, such as transformational institutional change (Kezar, 2013), reforms (Johnson, 2018; Mokher et al., 2020), new policy or practice (Bien & Sassen, 2020; Dellinger, 2019), implementation of programs (Almeida, 2016; Chadwick & Pawlowski, 2007), strategic planning (Steinberg, 2018), and more (O'Meara et al., 2014). The sensemaking framework has been used to explore how college students make sense of

college readiness program information (Almeida, 2016). However, more researchers have sought to understand sensemaking among faculty. Faculty play critical roles as instructors and middle managers; hence, researchers interested in sensemaking in higher education have sought to understand various aspects of their sensemaking, such as how faculty and administrators engage in the sensemaking process when coping with various internal and external pressures and changes (O'Meara et al., 2014; Deng, 2015a; Steinberg, 2018; Johnson, 2018).

Senior administrators have received attention as researchers seek to understand sensemaking among higher education leaders. However, the literature seems more limited than that, focusing on faculty. Still, the primary empirical focus is coping with change or reforms (Bien & Sassen, 2020; Mokher et al., 2020). Deng (2015b) studied how senior higher education administrators (rectors and deans) in two Danish universities make sense of the rapid change in their roles as strategic managers. The findings from this study are of particular interest to my inquiry because they show “how powerful...academic norms and values are—both in personal sensemaking and in organizational sensemaking” and that “scripts, routines, and institutions might be more significant in the ongoing sensemaking processes than is consciously recognized by the top level managers” (p. 910). Lastly, Deng also describes how sensemaking impacts goal setting and how external goals may serve as a sensegiving attempt. In contrast, personalized goals are more abstract and serve sensegiving and sensemaking. These findings underscore the importance of embedding my innovation in existing routines and structured spaces where norms are well established (i.e., the weekly Admin Team meetings). It also supports the proposition that as the Critical Sensemaking Data Briefs impact administrators' sensemaking, enactment could be manifested by creating or refining personal and organizational goals.

An important study by the proponents of critical sensemaking analyzes how a CEO at a Canadian community college successfully shepherded organizational change (Thurlow & Helms Mills, 2015). The CEO led an institution in a small province in Eastern Canada through a transformation from a vocational high school to a community college. Hence, the change was beyond restructuring the organization and required transforming the institution's identity, leadership, and organization. This study does not highlight the empirical findings but instead uses the case study to advance the framework and application of critical sensemaking and underscores "the importance of narrative practices of legitimation in sensemaking" (Thurlow & Helms Mills, 2015, p. 246). This highlights an area of potentially significant importance to my inquiry. It spotlights the need to pay particular attention to understanding how sensemaking is negotiated among the group and how power influences the legitimation process through the narratives and language members choose to communicate.

Dellinger (2019) examined how collaborative data-focused teams engaged in the sensemaking process to address institutional problems at a community college in California. Dellinger agrees that "institutional data alone do not answer the questions that institutions are asking about student outcomes, equity, and achievement" (p. 11). Utilizing a single case study design, Dellinger (2019) examined how two formal communities of practice, "data-focused inquiry groups," composed of faculty, staff, and administrators, engage in a one-year initiative established by the institution's Chancellor. The group's charge was to make "evidence-based" decisions to advance the institution's implementation of the Guided Pathways framework and "address the student equity gap in achievement" (p. 8-11). This research provides an example of using the sensemaking framework to examine the sensemaking process as it relates to using data, student equity, and its connection to strategic decisions at a community college.

Dellinger explains that “additional research is required to more deeply understand how individuals learn from one another and co-construct knowledge, how this process impacts the sensemaking process, and the outcomes of decisions made in this context” (p. 137). Additionally, Dellinger (2019) emphasizes the need “to better understand who has access to the data, how it is selected for use, what actions are taken and why” (p. 138). Moreover, she highlights the importance for “those who work with the data intimately, such as institutional researchers, need to be able to provide data in a way that tells the story rather than assume data literacy is high enough across the membership to ensure complete understanding” (Dellinger, 2019, p. 138).

Summary

In closing, current institutional research practices are anchored in the positivist, quantitative paradigm, and the needs and discourses of large, four-year institutions set trends. I have described my conceptualization of the IR process, where institutional researchers embrace their role as change agents and equity advocates. To guide my inquiry, I identified QuantCrit, data equity, and the sensemaking frameworks as useful analytical tools for examining how senior administrators at UNM-Taos engage in data sensemaking and conceptualize their professional responsibility for understanding student equity issues.

The use of these frameworks contributes to understanding and expanding their application in the higher education context. My inquiry illustrates the empirical use of these frameworks in the higher education, action research, and institutional research areas, as well as relating data to the sensemaking process and addressing equitable student outcomes. Specifically, it contributes to this literature by exploring the executive leadership group's engagement to make sense of data, focusing not on a one-time event

or initiative but as an ongoing practice. Additionally, beyond understanding how data sensemaking happens, my research examines the impact of formally scaffolding the sensemaking process. Lastly, my inquiry will contribute to understanding the role of data in the sensemaking process and how administrators' sensemaking relates to their professional role in advancing student equity outcomes.

CHAPTER 3

RESEARCH DESIGN

In Chapter 1, I provided an overview of the institutional research function and described the need for the role of the institutional researcher to evolve. Mainly, I emphasized how institutional researchers have a unique opportunity to lead the data sensemaking process at their institutions and actively play a role in advancing DEIB objectives. Additionally, I described my local context and the findings from the initial exploratory phase of my action research, which informed the design of the innovation, creating the Critical Sensemaking Data Briefs.

In the previous chapter, I explained that current institutional research practices remain quantitative-centric. Additionally, I presented my conceptualization of the IR process in which institutional researchers embrace their role as change agents and equity advocates. Furthermore, I provided an overview of the theoretical concepts guiding my inquiry, QuantCrit/data equity, and sensemaking.

In this section, I begin by briefly describing the theoretical alignment to the research design. Then, I detail the research and innovation design and explain the concept of the ladder of inference and how it is relevant to and used in my innovation. Additionally, I describe the setting and participants, my role in the inquiry, and the data collection and analysis methods. Furthermore, I outline the innovation's specifics and address the inquiry's trustworthiness, transferability, and boundaries.

Theoretical Alignment to the Research Design

As a researcher seeking to improve my practice and within my specific professional context, my inquiry is anchored in the action research framework (Herr & Anderson, 2005). Specifically, I draw from action science primarily associated with

Argyris (Argyris et al., 1985), focusing on communication as a central mechanism for organizational change (Herr & Anderson, 2005). Action research is located within a pragmatist paradigm, aiming to solve problems or improve practice. This is true of my inquiry. Due to the nature of my research questions, I employ a qualitative research design informed by a hermeneutical theoretical perspective concerned with the participants' experiences and their meaning-making processes (as explained in Chapter 2).

RQ1. How do senior administrators describe their experiences engaging in group discussion and personal reflection to make sense of data (participating in the CSDBs)?

RQ2. How does sensemaking through the CSDBs inform senior administrators' conceptions of professional responsibility toward student equity outcomes at UNM-Taos?

Below, I present a research design alignment table adapted from Bhattacharya (2017) to provide an overview of the inquiry design (see Table 4).

Table 4

Theoretical Alignment to The Research Design

Epistemology	Interpretivism (hermeneutical approach) Social constructivism (hermeneutical approach)
Theoretical Perspective	Phenomenology, Interpretivism
Theoretical Lenses	Sensemaking/Critical Sensemaking to ground RQs and data analysis QuantCrit/Data Equity to guide the innovation
Methodology	Phenomenological Single Case Study

Method and data sources:	Interviews, observations, field notes, researcher’s journal, photo voice (images and participants’ reflections)
Analysis Approach	Interpretivist Phenomenology
Re-presentation	Thematic descriptions of how senior administrators experience the collective sensemaking of quantitative data and how they experience their professional responsibility for equitable student outcomes.

The Ladder of Inference and Reflexive Loop

To explain why new insights or good strategies fail to be translated into action or changes in practice, Senge (1990) explains the importance of “mental models” in driving actions. The gap originates not from lack of conviction or resolve but because those new understandings “conflict with deeply held internal images of how the world works, images that limit us to familiar ways of thinking and acting” (p. 174). In short, mental models drive what we pay attention to or the information we focus on. This is part of the human condition and how the brain quickly processes large amounts of information. Hence, he points out, “this is no less true for supposedly “objective” observers such as scientists than for people in general” (p. 175). This is why “the inertia of deeply entrenched mental models can overwhelm even the best systemic insights” (pp.177-178).

Senge is a global and thought leader in systems thinking and organizational learning. His work focuses on identifying ways to understand complexity effectively. His writing on mental models is partly anchored on the theorist Argyris’ body of work, and the tools he developed for engaging with mental models (Senge, 1990). Argyris is considered the father of organizational learning and a pioneer of action science and organizational development.

Argyris's work on action science provided insights into “how our background shapes our behavior” (CampbellJones et al., 2020, p. 84). Argyris’s (1982) ladder of inference and reflexive loop can serve as a helpful tool to illuminate how sensemaking properties are manifested among senior administrators and to engage in sensebreaking and sensegiving.

Senge (1990) warns that “the most crucial mental models in any organization are those shared by key decision makers. Those models, if unexamined, limit an organization’s range of actions to what is familiar and comfortable” (p. 186). Thus, engaging in conscious reflection on the leaders’ values and how they enter their sensemaking process (i.e., the ladder of inference) has the potential to transform the leaders’ sensemaking.

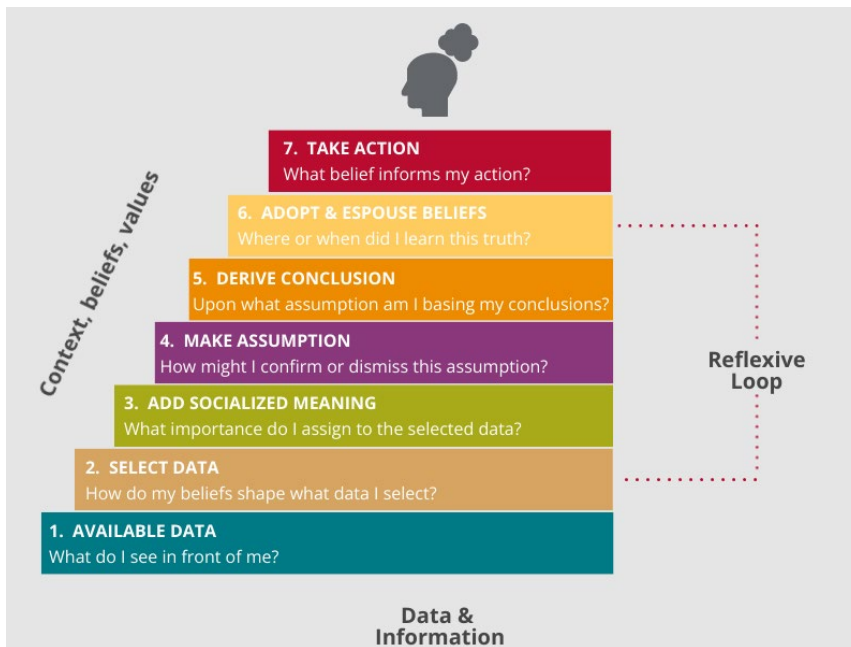
In his article, “Teaching Smart People How to Learn,” Argyris (1991) explains how individuals in key leadership positions consistently engage in defensiveness and are the primary obstacle to their own learning and creating long-lasting change despite being “well-educated, high-powered, high commitment professionals” (p.1). He describes how “teaching people how to reason about their behavior in new and more effective ways breaks down the defenses that block learning” (p. 3). This is accomplished when leaders critically reflect on how their actions and behaviors affect the organization.

The ladder of inference is a reflection tool created by Argyris (1982) that lays out how existing assumptions, values, and beliefs determine how individuals select, process, and interpret information, as shown in Figure 7. It was popularized by Senge’s book, *The Fifth Discipline*, first published in 1990. The ladder of inference offers one way to understand how individuals process information that guides behavior using the seven steps defined in the model. Thus, it serves as a tool to prompt a critical examination of assumptions. It also supports reviewing how individuals choose and process data,

discover personal values, and consciously understand the lens through which new information is filtered. Another feature of the model is the reflexive loop, the “automatic tendency to support current actions selected from available data. The underlying intent is to validate old ways of doing things, particularly things judged to be working to our benefit” (CampbellJones et al., 2020, p. 84). It is a reflexive instinct where, instead of critically climbing the ladder of inference, existing beliefs and assumptions affect the data selected and deemed important.

Figure 7

The Ladder of Inference with Critical Questions



Note. Graphic adaptation of the ladder of inference based on CampbellJones, Keeny, S., & CampbellJones, F. (2020). *Culture, class, and race: constructive conversations that unite and energize your school and community*. ASCD.; and Senge. (1994). *The Fifth discipline fieldbook: strategies and tools for building a learning*.

Engaging in critical inquiry of our beliefs and assumptions can interrupt the reflexive loop—allowing us to consciously climb through the ladder of inference and

identify other information we would otherwise have disregarded. As CambellJones argues, “if behaving differently is the objective, simply adding more data without critiquing the belief as to why the data were selected distorts the process and leads to a high probability of obtaining the same results” (2020, p. 82). The ladder of inference is a tool that can be used for reflecting on emotions, engaging in discussion of challenging issues, and as a vehicle to provide feedback.

Senge (1990) argues that “developing an organization’s capacity to work with mental models involves both learning new skills and implementing institutional innovations that help bring these skills into regular practice” (p. 186). This study uses the ladder of inference as part of the innovation during the Critical Sensemaking Data Briefs. The purpose of using this tool is two-fold. It serves as a guide for administrators to reflect on how they chose and engage with data and as a springboard for group discussion for intentional and collective data sensemaking.

Photovoice

Photovoice originates in community-based participatory research (Cridland et al., 2019). It is a qualitative research method in which participants create photographs and written or verbal narratives about an experience (Latz, 2017). Wang and Burris (1997) are recognized as the creators of the method. They stated three primary aims: 1) to record and reflect on the participant/community experiences, 2) to engage in critical consciousness, and 3) to generate change by reaching policymakers. Latz (2012a) proposed to add the parallel or secondary aim of reflective consciousness. Photovoice can support placing participants at the center of the inquiry. As Latz (2012a) explains, reflective photovoice “may be best suited for projects focused on the participants themselves” (p.60). The photovoice exercise creates the conditions for participants to “stop and think” and creates an “impetus to pause and generate meaning” (Latz, 2012, p.

55). Photovoice is a form of arts-based research, “a heuristic through which we deepen and make more complex our understanding of some aspect of the world” (Barone & Eisner, 2011, p. 3). Cridland et al. (2019) propose some questions for the researcher when considering using photovoice, including “What are the existing structural filters that make it difficult for individual community members to reflect honestly on their experiences (e.g., oppressive discourse or hierarchical structures)?” (p. 173). As a colleague of the participants, photovoice will allow me to create a space where administrators can respond anonymously to a deeply personal question and reflect without an added urgency of time. Additionally, using an art form as a means of communication allows participants to convey the complexity of their feelings in ways that may not be as accessible through narrative means (Latz, 2017).

The Innovation

The investigation leveraged the innovation to examine how participating in collective data sensemaking sessions impacted how the UNM-Taos Admin Team created meaning and understanding from the data. In addition, the sessions disseminated data constructed using a QuantCrit/data equity lens to investigate potential effects on the group's sensemaking concerning equity topics.

The innovation includes three Critical Sensemaking Data Briefs (CSDB) plus three initial and ending reflection sessions. The planned duration of the CSDBs was 30 minutes, but the actual duration varied based on participants' questions and discussion (see Table 5). The CSDBs were embedded in the Admin Team's Working Meetings, which occur on the second and fourth Tuesdays of the month. During these sessions, the institutional researcher presented data analyses and facilitated discussion, providing structured time for administrators to review, interact, and engage in dialogue about the data. The first and last sessions entailed a reflective discussion based on the photovoice

exercise. The three data briefs focused on three of the five Key Performance Indicators (KPIs) the institution established in the Fall of 2021. The team received infographics with each measure and respective trends in F21 and F22. However, before the CSDBs, participants had not received any related analyses. The presentations covered: 1) the dual credit conversion rate, 2) the enrollment growth rate of students 25 and older, and 3) the credit completion and DFW rates. All analyses presented data disaggregated by ethnicity and gender, highlighting gaps in access or outcomes.

Before beginning the CSDBs, I provided a brief overview of the photovoice exercise as a 10-minute agenda item in an Admin Team meeting. One week before the CSDB, I emailed participants detailed instructions for the photovoice exercise. As outlined in Table 5, the first session discussed the images and reflections participants submitted for the photovoice exercise. The second CSDB provided an introduction and overview of the ladder of inference and reflexive loop, and the team reflected and discussed how they approached information. None of the participants were familiar with the ladder of inference before the session. In the third, fourth, and fifth sessions, the participants received a presentation of quantitative analyses. They discussed differences in student outcomes with particular attention to differences by race/ethnicity and gender (see Table 5). In the sixth and final session, the participants revisited the images for the photovoice project and shared a collective reflection.

Table 5*Critical Sensemaking Data Briefs Schedule*

Session	Topic	Date	Duration (min)	N
CSDB#1	Images Discussion	4/11/2023	22:06	8
CSDB#2	Ladder of inference	4/18/2023	55:40	9
CSDB#3	Credit Completion & DFW Rates Analysis	4/25/2023	59:25	8
CSDB#4	Post-traditional Student Population Analysis	5/30/2023	32:49	6
CSDB#5	Dual Credit Conversion Rate Analysis	6/6/2023	44:52	8
CSDB#6	Revisiting Image Discussion	6/20/2023	33:37	9

Case Study Design

The structure of my investigation followed a single-case embedded unit design (Yin, 2018). Case study research is appropriate when the research questions are about “how” or “why” and relate to “a contemporary set of events over which the researcher has little to no control” (Yin, 2018, p. 13). My inquiry sought to understand an intangible, personal, and complex process—data sensemaking. Moreover, my research questions concern “how” senior administrators experience it and their responsibility toward equitable student outcomes. Sensemaking is an intangible process that cannot be bounded by a discrete period. It is a dynamic, ongoing event over which “the researcher has... no control” (Yin, 2018, p. 13). The innovation represented an event where I could observe and ask the participants to reflect on how they experienced the sensemaking process.

The inquiry satisfies Yin's (2018) first portion of the definition of case study research, *scope*, because sensemaking in a time-unbounded process that is intrinsically related to the leaders' professional context that can only be understood through in-depth inquiry. The complexity of sensemaking makes it so that even the participants must engage in reflective and meaning-making processes before they can convey their experience to someone else. Because sensemaking is ongoing, this inquiry only captured experiences bounded by the participants' institutional and professional contexts and the particular time they experienced the innovation.

This study also satisfies Yin's second portion of the definition, *features*, because sensemaking among executive leaders is a "technical distinctive situation" that can be dependent or impacted by numerous variables that may not be quantifiable or measurable and for which the inquiry may have few data points (interviews, observations) at only one point in time (no longitudinal or panel data). Additionally, the inquiry necessitated and benefited from "theoretical propositions to guide design, data collection, and analysis" (Yin, 2018, p. 15). Sensemaking (Weick, 1995) is a theoretical construct I used to guide the design of the inquiry and analysis that facilitated my understanding of how senior leaders consume, interpret, extrapolate, and make sense of data that will ultimately inform how they make decisions. The inquiry relied on "multiple sources of evidence," interviews, observations, images, and artifacts, that were triangulated to try to understand the sensemaking process of UNM-Taos administrators within that specific context.

The case study propositions guiding the inquiry are:

P1. Lived experience and professional roles (biases and assumptions) are active filters by which leaders process data and information. However, engaging in guided collective data sensemaking, through sensebreaking and sensegiving,

may produce more profound and robust sensemaking to inform decision-making

P2. Consistently consuming data crafted using a QuantCrit/data equity lens during structured times facilitates the transition from passive information intake to co-construction of knowledge that results in more comprehensive and nuanced sensemaking, which motivates action towards addressing student equity gaps.

The case is defined as the Admin Team at UNM-Taos, the senior leadership group for the college (N=11). The Admin Team includes the Chancellor, Dean of Academic Affairs, Associate Dean of Career Technical Education, Director of Student Affairs, Strategic Support Manager, Human Resources Administrator, Development Officer, Information Technology Services Manager, Facility Operations Manager, Business Manager, and Sr. Institutional Researcher. Therefore, the primary unit of analysis was the Admin Team. However, using the embedded unit design allowed me to analyze the group as a decision-making body with individual perspectives. The embedded structure is appropriate for my inquiry because the research questions focus on the individuals' perspectives and lived experiences (phenomenology). Van Manen (2016) explains that phenomenological inquiry is concerned with the meaning of experienced reality and gravitates to “meaning and reflectivity” (p. 17). The embedded unit design also facilitates the consideration of the positionality of professional roles (power dynamics), which are a factor in critical sensemaking.

The case was bounded in time by the implementation period of the innovation, which happened during the Spring and Summer of 2023 semesters (April to June). The phenomenon is defined as the sensemaking experienced by each member of the Admin

Team, while the context is the organization (UNM-Taos). The case study has a descriptive aim and uses a qualitative approach.

Setting and Participants

The setting is the University of New Mexico-Taos, a two-year, small, rural public college. The participants are the members of the Admin Team, which has 11 members, as described in the previous section. One member declined to participate in the study, and I have a researcher-observer role. Hence, the study had nine active participants (see Table 6). Most team members are female (67%), participants' ages ranged from 47 to 60 years old, and six participants have been with the institution for more than 10 years (see Table 6). The innovation was embedded into the Admin Team Working Meetings scheduled on the second and fourth Tuesdays of the month.

Table 6

Study Participants

ID	Race/Ethnicity	CSDB Participant	Interviewee
P1	White	Y	Y
P2	Hispanic	Y	Y
P3	Hispanic	Y	Y
P4	Hispanic	Y	Y
P5	Hispanic	Y	Y
P6	White	Y	Y
P7	Hispanic	Y	Y
P8	Hispanic	Y	N
P9	Hispanic	Y	N

All members participated in the data analysis presentations. However, the members were asked for formal consent to participate in the dissertation inquiry and could refuse to participate in the discussion and reflection portions. Additionally, the Admin Team Working Meetings already had an element of voluntary participation that the Business Meetings do not. All members are required to attend. However, the meetings begin with critical updates by all departments. Members may leave once the critical updates conclude if the agenda or working items are irrelevant. A subset of the participants was selected to participate in the interviews, which included all the Admin Team members who are also members of the Cabinet, the institutional body charged with strategic planning.

Given that my inquiry collected data from human subjects, I secured approval from the Institutional Review Board at the University of New Mexico and Arizona State University before starting the study (see Appendix K).

Role of the Researcher

In my role as the UNM-Taos institutional researcher and as a member of the Admin Team, I was a participant observer. As the institutional researcher, I prepared and presented the quantitative analyses to the Admin Team. Additionally, I served as the facilitator of the CSDB discussions and answered clarifying questions from the group.

To be clear, my stance is not neutral. I am seeking to advocate for an equity-minded way to engage with data and to ensure the team is consuming at least some of the key analyses produced by IR. My formal education and professional experience until this point have been firmly rooted in a positivist perspective. Even now, as an institutional researcher, my profession is highly pragmatic, with a significant amount of positivist tendencies. Nevertheless, for my problem of practice, I sought deep,

meaningful, nuanced understanding that is not quantifiable. I want to understand how to help my team engage with data in more meaningful ways that catalyze action specifically to improve student outcomes. Additionally, this study has allowed me to develop my understanding and skills as a qualitative researcher so that I may integrate those skills into my practice in future inquiries. I want to continue exploring how we build understanding, how understanding connects to our actions, and how those actions create different realities for different people.

Although I am not formally applying the Promotora and Applied Critical Leadership (ACL) frameworks in my inquiry, as Carmona et al. (2018) posit in their hypothetical example, I do lean into the spirit of those concepts in the way I think of my role as an institutional researcher. I moved to Taos in February of 2020; hence, I am still relatively new to the community, and taking a formal *promotora* approach would be inappropriate. Promotoras “draw on their community networks and community knowledge to deliver important information in culturally nuanced ways” (Carmona et al., 2018, p. 143). Nevertheless, as a Hispanic female, immigrant, and English learner, I embrace the responsibility to advocate for improving educational access and outcomes for underserved communities. From the ACL perspective, “transformational leaders question how their identity and history positions them to see, understand, and serve the organization” (Carmona et al., 2018, p. 141). Significantly, identity should “be leveraged, reflected upon, and also, enhanced through relationship building and learning” (Carmona et al., 2018, p. 141). In this role, the researcher has the responsibility to “propose alternatives to existing dynamics and provide evidence as to why such alternatives would promote access for Latinx students” (Carmona et al., 2018, p. 151). In other words, I am conscious of how my life experiences and background inform my interest in student outcomes equity. Moreover, I embrace my personal and professional

responsibility to advocate for change that supports student equity and to be a change agent.

Additionally, as an observer-participant in this research, I come to this inquiry with my own assumptions. Based on my interactions with colleagues during the last two years, I believe that leaders (faculty and staff) at UNM-Taos genuinely and deeply care about UNM-Taos students and their academic outcomes. I also believe they sincerely care and thoughtfully think about student equity issues. However, as in most large and complex organizations, structures, policies, politics, and internal and external pressures play a significant role in causing individuals and teams to retreat to engrained mental models that ultimately diminish efforts toward measurable and systemic change.

Proposed Data Sources & Collection

Given the single case study design, the data sources and collection follow a purposeful selection. Plano Clark and Creswell (2015) describe a purposeful sample as one that selects individuals “who can best help explore the central phenomenon in depth” (p. 333). It means the participants can provide a helpful, detailed, and in-depth understanding of the phenomenon being studied. Since my inquiry concerns data sensemaking among executive leaders, I selected Admin Team members because they represent the focus of my inquiry. The Admin Team at UNM-Taos is the institution's highest leadership team and makes the most critical operational and policy decisions. They represent the institution's operational aspects, from academic and student services to facilities management or business operations. The case is defined and aligned with the institution's organizational structure. Hence, membership into the group (the Admin Team) defines whether an embedded unit is included or excluded from the case. Yin (2018) advises a minimum of two cases. Otherwise, he states, the researcher "should be prepared to make an extremely strong argument in justifying your choice for the case"

(p. 62). For this inquiry, the rationale for including only one case is the overarching aim of action research, which is a "systematic inquiry into one's own practice" (Mertler, 2017, p.4, citing Johnson, 2008). This project aimed to identify ways to improve my practice as the institutional researcher at UNM-Taos to better contribute to the Admin Team. Hence, including other cases are unnecessary to fulfill that purpose.

This case study relied primarily on three sources of evidence: group member interviews, group member reflections and artifacts created during the innovation implementation (written reflections, images), and artifacts created by the researcher (researcher's journal, field/observation notes).

Interviews

The phenomenological approach makes interviews one of the most vital data sources. I conducted one-on-one interviews with seven members of the Admin Team to gain insight into their perspectives, such as the description of their sensemaking process and how their sensemaking relates to their professional roles and understandings of student equity issues at UNM-Taos (see Appendix C for the Interview Protocol and questions). All interviews were conducted after all the CSDB sessions were completed. The purposeful sample included members of the Admin Team members who also serve on the Cabinet (the Chancellor, the Dean of Academic Affairs, the Associate Dean of Career Technical Education, the Director of Student Affairs, the Strategic Support Manager, the Director of Grants and Institutional Advancement, and the Business Manager). These positions are crucial in student services, academic, and budgetary decisions.

The interview aimed for the participants to share how their personal and professional experiences inform their perceived role in addressing student inequities at

the institution and if and how participation in the CSDB discussions has impacted their understanding of their role or student inequities at the institution.

The qualitative interviews were conducted face-to-face and followed a semi-structured format. The participants were interviewed once all the CSDB sessions were completed. The interviews were estimated to take 45 to 60 minutes but ranged from 22 to 59 minutes. With the participants' consent, I recorded the sessions using the voice memo tool of an iPhone. The recordings were transferred to a secure drive and deleted from the phone. The recordings were transcribed to prepare for analysis using a combination of software assistance (Temi) and manual corrections by the researcher.

Facilitator Observation Memos

Due to my insider status as participant-researcher, I facilitated and observed the CSDB sessions. Therefore, I collected observations (field notes) as another crucial data source in my inquiry. As a participant observer, I observed non-verbal communication among the participants, their interactions, conversations, and noted the questions that arose and topics discussed (see Appendix B for CSDB Observation protocol). I took an active role in the study. Also, I recorded a description of what I observed—descriptive field notes, personal thoughts, “insights, hunches, reactions or broad ideas and themes that emerge during the observation— and reflective field notes” (Plano Clark & Creswell, 2015, p. 344). Additionally, I wrote memos documenting my experience of the session and my reflections.

Researcher's Journal

During the study, I kept a researcher's journal to document my observations outside the CSDB, my perceptions, emotions, progression of thoughts, and reflections. I used a paper journal for easy access when necessary but transferred my entries to an organized OneNote notebook to refer to during the analytical process.

Visual Artifacts

The innovation included asking the participants to create or collect one visual image before the CSDB sessions. Participants chose to create photographs or collect images that provided insight into how they perceived their professional responsibility toward equitable student outcomes at the institution. Emme (2008) explains that "photovoice has often been used by research participants in community self-study or...exhibits that serve as a vehicle for engaging institutions about policy around community concerns" (p. 2). In this instance, I sought to engage the participants in critical reflection. The participants are experienced and highly educated administrators. Hence, I had concerns about how those identities and expectations around the use of data would precondition their responses to direct collection methods such as interviews. Observations are essential contributions to the data set but reflect my perspective. Therefore, it was essential to integrate other data sources from the participants' perspectives that did not directly involve an interaction with me. Photovoice provided a unique opportunity because it allowed for the direct expression and views from the participant but did so in a way that limited conscious messaging to be conveyed, as opposed to reasoned answers to interview questions. Latz (2017) identifies the 'pro' side of photovoice to be "the visceral power of photography, participant-centeredness, and capacity for policy change (i.e., action)" (p. 153). All of these features provided meaningful support to my inquiry.

As part of this exercise, I asked the participants to write a one-page reflection explaining their chosen images for the project. This allowed them to submit a comprehensive explanation privately, giving them more freedom to choose what they wanted to share in the group discussion. They also had the opportunity to see all the images and discuss their images in the first and last CSDB sessions. The prompt was to:

- 1) Create or collect one image (take an original photograph or collect an existing photograph, a digital copy of a painting, sculpture, or other visual artwork) that conveys what it feels like to you to be professionally responsible for equitable student outcomes.
- 2) Write a one-page reflection about the image or record a 5 to 10-minute voice reflection about the image. The reflection should be included: a) Why did you choose this image? Moreover, b) Describe how the image reflects how you feel about your professional responsibility toward advancing equitable student outcomes.

To ensure anonymity and facilitate the collection of the image files and reflections, I used a Qualtrics instrument. These files were collected before the group discussion of the images during the first session. The protocol for this exercise is presented in Appendix D.

Data Analysis Phase 1

The research design for the inquiry is an embedded single case study. Although the primary unit of analysis is the team and evaluating the case study propositions, I am equally interested in how each administrator experiences their role in the innovation. Therefore, the first phase of the analysis focused on the phenomenological aspect of the inquiry to address the research questions, which focus on understanding the leaders' experience in the CSDBs. This entailed conducting a phenomenological analysis of the interview transcripts. Eatough and Smith (2017) explain that interpretative phenomenological analyses “share a concern with unraveling the relationship between what people think (cognition), say (account), and do (behavior)” (p. 11).

In a phenomenological analysis grounded in hermeneutics, the researcher is “an instrument by which the phenomenon may be understood” (Dibley et al., 2020, p. 114).

The analysis is an “act of interpretation” that only approximates understanding of the participants’ experience while acknowledging that complete understanding cannot be reached (Dibley et al., 2020, p. 114). Because “humans are self-interpreting beings that make sense of our world through our experiences and interpretation of it,” it is an iterative process for which there are no required steps or stages to be followed (Dibley et al., 2020, p. 114; Van Manen, 2016). However, recognizing my status as a novice qualitative researcher, I honored the philosophical underpinnings of this hermeneutical process through cyclical reflection and memo writing (interpretative summaries). However, I used some general steps to support me through the analysis journey (Dibley et al., 2020).

1. I compiled all relevant experiential statements from all participants’ interview transcripts into a single text file.
2. I read the statements several times and organized the statements with shared underlying meanings. I grouped statements that, although expressed differently, had the same core meaning.
3. I continued this process until I grouped all statements by shared meaning units.
4. I re-read the statements in each meaning unit again and used a mind map tool (Cmap) to list all the meaning units to cluster them.
5. I reflected on connections among the grouped meaning units and clusters and began drafting themes.
6. I wrote summaries for each theme that presented a thematic portrayal of the experience.

After concluding the phenomenological analysis, I conducted the thematic analysis for the case study.

Data Analysis Phase 2

The second phase of analysis aimed to generate insights and organized empirical evidence to evaluate the case study propositions. The analysis focused on the effectiveness of the innovation (CSDBs) to deepen sensemaking and serve as a catalyst for motivating action toward student equity. It involved qualitatively coding the interview transcripts while revisiting the participants' photovoice reflections and the facilitator observation memos. To begin the coding process, I used an inductive (bottom-up) analytical approach (Saldaña, 2021). Specifically, I used the following coding process:

- In Vivo and Values coding
- Reduction process: code mapping & focused coding

I used In Vivo coding because using inductive coding is appropriately aligned with the phenomenological approach of my inquiry as it preserves the participants' own words through the coding process. The codes are a “selected word or short phrase from the actual language found in the qualitative data record” (Saldaña, 2021, p. 137). Saldaña also highlights that it is his “go-to” method with interview transcript data” and it is a good choice for “beginning qualitative researchers learning how to code data” (2021, p. 138).

Saldaña (2021) states that values coding (attitudes, values, and beliefs) “is appropriate for virtually all qualitative studies” (p. 168). However, the researcher “does not necessarily have to code for all three or differentiate between them” (p. 168). Values coding allowed me to explore further how assumptions and beliefs manifest in the data sensemaking process and illuminate the ladder of inference for senior leaders at UNM-Taos.

Utilizing the code mapping process to transition from the first to the second coding cycle entailed comparing and sorting the codes and creating and assigning the codes to related categories. The codes are organized and sorted into tentative categories created by the researcher to capture commonalities or insights across the group of codes.

I used focused coding for the second coding cycle because it “follows In Vivo coding ” (Saldaña, 2021, p. 303). Additionally, it requires the researcher to identify and develop “the most salient categories in the data” (Saldaña, 2021, p. 303).

Because the initial analytical coding process is bottom-up, I could not foresee themes and insights a priori. However, as I engaged in the interpretation and hermeneutical process of developing the themes, I could contrast the themes and body of empirical data to case study propositions.

I coded using the Qualitative Data Analysis Software (QDAS) Dedoose. It is a cloud-based software for processing text, audio, and video files. The software offers comprehensive and robust analytical tools, including the capacity to create, organize, and link coding and analytical memos.

Case Study Analytical Approach

To synthesize and triangulate all the data to inform the case study's findings, I used the pattern-matching analytic technique defined by Yin (2018). I worked to identify the themes emerging from the data analysis that could be sorted into evidence congruent with the stated propositions and evidence that does not.

In pattern-matching for outcomes, I aimed to identify evidence toward generating action items that emerge from the group data discussions and references to perceptions of having more nuanced understandings or the administrators’ perceptions of making better data-informed decisions. Additionally, I identified evidence describing how participating in the data sessions increased the awareness of student equity gaps

and motivations to act. Although the themes emerged from the data, the analytical process was informed by the conceptual components of Critical Sensemaking.

In pattern-matching for processes, I sought to identify evidence contrasting the individual sensemaking approach when each member consumes data independently compared to when they can review and discuss data together. Additionally, I worked to identify patterns of how the Admin Team members describe their experience of the process of sensemaking.

Table 7 summarizes the alignment between the research questions, case study propositions, data sources, and analyses.

Table 7

Alignment of Research Questions, Propositions, Data Sources, and Analyses

RQs.	RQ1. How do senior administrators describe their experiences engaging in group discussion and personal reflection to make sense of data?	RQ2. How does sensemaking through CSDBs inform senior administrators’ conceptions of professional responsibility toward student equity outcomes at UNM-Taos?
Propositions	P1. Lived experience and professional roles (biases and assumptions) are active filters by which leaders process data/information. However, engaging in guided collective data sensemaking, through sensebreaking and sensegiving may produce more profound and robust	P2. Consistently consuming data crafted using a data equity lens during structured times facilitates the transition from passive information intake to co-construction of knowledge, resulting in more comprehensive and nuanced sensemaking, motivating action towards addressing student equity gaps.

	sensemaking to inform decision-making*.	
Data Analysis & Sources	Phenomenological Analysis · Interviews *Note: The Case Study Thematic Analysis informs the second portion of the proposition.	Photovoice written and verbal reflections Case Study Thematic Analysis · Interviews · Facilitator observation memos
Additional study documentation	Researcher's journal	

Reporting the Case Study

Through pattern matching and the theoretical lenses guiding the inquiry, I consolidated the insights and themes to the case level (Admin Team). I do not present findings around the embedded units (individual administrators) to uphold confidentiality.

Trustworthiness

The features and aims of qualitative research are fundamentally different from those of quantitative studies. However, qualitative researchers must ensure the study's quality and usefulness. To this end, I used the trustworthiness criteria, as Shenton (2014) explained. Shenton (2014) summarizes four criteria for trustworthiness: credibility, transferability, dependability, and confirmability.

Credibility

The methods I used in this inquiry—interviews, observations, field notes, researcher's journal, and photovoice—are common and well-established in qualitative

research. Triangulation of these methods also offers a way to increase credibility. It refers to collecting evidence from different individuals or data types to corroborate findings (Plano Clark & Creswell, 2015). In my study, I contrasted the evidence from individual members of the senior leadership team and collected different types of data, as previously detailed in this chapter. Furthermore, I conducted member checking. Plano Clark and Creswell (2015) describe member checking as “a process in which the researcher asks one or more participants to check the accuracy of a finding” (p. 364). Hence, once I identified the findings of my analysis, I conducted member checking by sending the analysis draft to a subset of the participants to request feedback regarding the completeness, accuracy, and fairness of the representation of my findings and shared highlights of the findings with the team. Another provision to raise the inquiry's credibility is to engage with the organization early in the study to ensure the researcher's familiarity with the organizational culture (Shenton, 2014). Since I am a part of the organization and the leadership team, I am well acquainted with the organizational culture at UNM-Taos and deeply understand the context. However, I also engaged in reflective commentary or bracketing, which refers to the practice of the researcher engaging in reflective writing to document the researcher's “own views and experiences” to help “ensure that the researcher's perspective does not overwhelm the perspectives of the participants” (Plano Clark & Creswell, 2015, p. 364; 2014). Furthermore, I work to include thick descriptions of the context and phenomenon, methodological and method choices, and analysis.

Transferability

Although the reader of the research findings is ultimately the one to decide if any aspects of the inquiry or results are potentially or adequately transferable to their context, it is the researcher's responsibility to provide a detailed description of the

context and phenomenon for the reader to be able to make that decision (Shenton, 2014). This manuscript provides a detailed account of the context and problem of practice and provides significant amounts of empirical data to substantiate the themes. Additionally, as my analysis and findings allowed, I comprehensively describe the phenomenon (data sensemaking).

Addressing the study's boundaries is another vital transferability feature (Shenton, 2014). Although several of the boundaries of this study have already been mentioned, I addressed them comprehensively here.

- a. Given the action research and single case study design, only one organization, UNM-Taos, is part of the inquiry.
- b. The data contributors to the study are the senior leadership team at UNM-Taos. Hence, the study has nine participants (excluding myself), and is informed by seven interviews (a subset of the nine participants, or 10 team members, excluding myself).
- c. The data collection methods have been detailed earlier in this chapter. There were six Critical Sensemaking Data Briefs (CSDB) in which data was collected - three reflection sessions and three data analysis presentations, including recordings of the discussions and observations. I also conducted seven interviews, completed at least one reflection per session, and created analytical memos. Lastly, as described earlier, the data was collected over the Spring and Summer of 2023 terms, with specific details included in this manuscript.

Dependability

The researcher can make two provisions to address dependability: using overlapping methods and providing in-depth methodological descriptions (Shenton,

2014). I have provided a detailed description of the methods in this chapter. However, here, I address the second provision. Although I am a developing qualitative researcher, I have years of experience as a professional quantitative researcher. Therefore, I am well aware and experienced in tracking and collecting metadata and documenting implementation and analytical procedures. These are transferable skills that I brought to this study. The appendices of the manuscript include metadata on the operational aspects of the inquiry, complete protocols, questions used in the interviews, and the CSDB.

Confirmability

Some of the provisions already outlined also support confirmability. However, additional ones include the researcher's admissions of beliefs and assumptions, recognition of shortcomings, and use of diagrams to demonstrate an audit trail (Shenton, 2014). Earlier in this manuscript, I addressed some of my beliefs, assumptions, and positionality in the 'role of the researcher' section to be transparent. I also documented my beliefs and assumptions throughout the inquiry via the researcher's journal and memos to seek to illuminate and identify my biases. Additionally, I have been transparent about my novice status as a qualitative researcher and addressed the boundaries of my inquiry to aid the reader's understanding of the applicability of my study to potentially other contexts. Beyond utilizing code mapping during the analytical process, I also leveraged mind maps (diagrams) to provide documentation and an 'audit trail' of my analytical process.

In short, to support the trustworthiness of my inquiry, I made the provisions outlined here to address the four criteria of trustworthiness as summarized by Shenton (2014).

Summary

I described the single, embedded, and phenomenological case study design in this chapter. I explained and supported the theoretical and epistemological alignment of my research design and described the significant components of my innovation. The leadership team at UNM-Taos participated in the Critical Sensemaking Data Briefs, where they received the results of quantitative data analysis crafted using a data-equity lens and engaged in discussion. Additionally, they reflected on their personal beliefs, biases, and assumptions by learning about and applying the ladder of inference (Argyris, 1982; Senge, 1990; CampbellJones, 2021). Data informing this inquiry include interviews, observations, artifacts, and the researcher's journal. Furthermore, I documented my data analysis process. As a participant and researcher, I clarified my role and positionality in this inquiry and carefully explained how I addressed the trustworthiness of my study.

CHAPTER 4

DATA ANALYSIS & FINDINGS

To restate, this study follows a phenomenological single-case embedded design. The case is the leadership team. However, the embedded structure is relevant because it allows me to examine the participants' perspectives and lived experiences. Hence, I approach the research questions through a phenomenological analysis and evaluate the case study propositions through a thematic analysis. As previously mentioned, the two research questions are:

RQ1. How do senior administrators describe their experiences engaging in group discussion and personal reflection to make sense of data (participating in the CSDB)?

RQ2. How do senior administrators at UNM-Taos describe their professional responsibility in achieving equitable student outcomes?

The two case study propositions are:

P1. Lived experience and professional roles are active filters by which leaders process data/information. However, engaging in group sensemaking may produce a more profound and robust understanding to inform action.

P2. Consistently consuming data crafted using a data equity lens during structured times facilitates the transition from passive information intake to co-construction of knowledge that results in more comprehensive and nuanced sensemaking, which motivates action toward addressing student equity gaps.

In this section, I detail the analytical processes and relate the findings resulting from this investigation. As stated in Chapter 3, this study follows two data analysis phases. The first phase addressed the research questions through a phenomenological

analysis to gain insight into how leaders experienced the Critical Sensemaking Data Briefs and their professional responsibility toward equitable student outcomes. The second phase is the overarching analysis approach to this inquiry, designed to provide evidence to assess the case study propositions.

Data Analysis Process

First, I provide an overview of the data sources and the process I used to organize and analyze the data. Then, I describe each analysis phase and the corresponding findings for the research questions and case study propositions.

Observations

As the presenter and facilitator of the CSDBs, I recognized my limited ability to record observations necessary for analysis. Therefore, with the participants' consent, I utilized recordings of all CSDB sessions to conduct the observations afterward (see Table 8). After each CSDB, I watched the video and recalled my experience during the CSDB to record my observations using the Facilitator Observation Protocol (Appendix B). Throughout the analysis phase, I constantly revisited these memos to reflect, check for congruence as I generated themes, and verify my understanding as I aligned the phenomenological and thematic analyses.

Table 8

CSDB Duration and Total Participants

Session	Topic	Date	Duration (min)	N
CSDB#1	Image Discussion	4/11/2023	22:06 min	8
CSDB#2	Ladder of Inference	4/18/2023	55: 40 min	9
CSDB#3	Credit Completion & DFW Rates Analysis	4/25/2023	59:25 min	8

CSDB#4	Post-traditional Student Population Analysis	5/30/2023	32:49 min	6
CSDB#5	Dual Credit Conversion Rate Analysis	6/6/2023	44:52 min	8
CSDB#6	Revisiting Image Discussion	6/20/2023	33:37 min	9

Photovoice

The photovoice exercise was specifically designed to address the second research question. I collected images, brief reflections written by each participant, and recordings of the reflection discussion during the CSDBs. I used these three sources to write observation memos, which I consulted throughout the analysis.

Interviews

The interviews were a crucial data source designed to answer the first research question through phenomenological analysis and to provide evidence to evaluate the propositions through thematic analysis. Each interview was recorded using the iPhone Voice Memo tool. After each interview, I immediately downloaded the recording into a safe file folder and deleted the recording from my phone. The mp4 files were uploaded to Temi, a cloud-based transcription service. After converting to text, I downloaded each file and carefully read and listened to the recording to make corrections. The duration of each interview and the quality of the transcripts before corrections, as reported by Temi, are presented in Table 9. Each participant was assigned a unique ID and a pseudonym to facilitate the analysis process and the sharing of results.

Table 9*Interview Duration and Transcript Quality Before Corrections*

Participant	Duration	Audio Quality	Low Confidence Phrases
P1	45:22 min	High	9%
P2	57:06 min	High	9%
P3	57:42 min	High	10%
P4	25:15 min	High	9%
P5	52:35 min	High	7%
P6	59:17 min	High	8%
P7	34:17 min	High	10%

I combined all transcripts into a single MS Word file to conduct the phenomenological analysis. I carefully read each transcript and removed all text not addressing the participants' experience during the CSDBs. The final document for research was an MS Word file that included all relevant experiential statements from all the participants.

In contrast, I uploaded each participant's complete and corrected transcript to Dedoose for the thematic analysis. Before beginning the coding process, I read the transcripts several times to familiarize myself with the contents and prepare for the coding process.

Data Analysis Phase One: Phenomenological Analysis

This first phase of the analysis focuses on understanding each leader's experience during the CSDBs and how they experience their professional responsibility toward

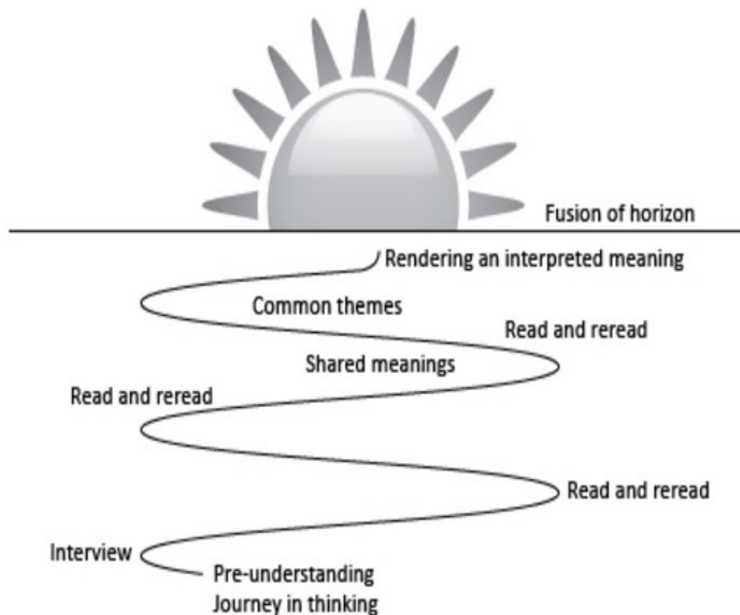
equitable student outcomes. Below, I describe the analytical process to address the first research question through the phenomenological analysis of the interview transcripts. Subsequently, I describe the analytical process to address the second research question through the data produced in the photovoice exercise.

In a phenomenological analysis grounded in hermeneutics, the researcher is “an instrument by which the phenomenon may be understood” (Dibley et al., 2020, p. 114). The data collected are the representations of the participants’ experiences. In this inquiry, these representations include the researcher’s observations, video recordings of the CSDBs, transcribed text from participant interviews, images collected by the participants, and their written reflections. The analysis is an “act of interpretation” that only approximates understanding of the participants’ experience while acknowledging that complete understanding cannot be reached (Dibley et al., 2020, p. 114). Thus, this work offers only possible insights into the experience of participating in the CSDB. This type of phenomenological analysis does not seek to generate a theory or provide explanations.

Because “humans are self-interpreting beings that make sense of our world through our experiences and interpretation of it,” it is an iterative process for which there are no required steps or stages to be followed (Dibley et al., 2020, p. 114; Van Manen, 2016). However, recognizing my status as a novice qualitative researcher, I honored the philosophical underpinnings of this hermeneutical process through cyclical reflection and memo writing (interpretative summaries). However, I used some general steps to support me through the analysis journey (Dibley et al., 2020). Figure 8 shows Dibley et al. (2020) visual representation of the analytical process.

Figure 8

The Researcher’s Journey Toward the Fusion of Horizons (New Understanding) by Dibley et al. (2020)



Analytical Process for Research Question 1: How leaders experience the CSDBs

As stated earlier in this chapter, I began the analysis by compiling all relevant experiential statements from all participants into a single text file. Then, I read the statements several times and organized the statements with shared underlying meanings. For example, these statements from two participants highlight how a valuable part of the experience was being able to ask and listen to questions.

Gabi: “We have a chance to ask questions and get explanations; that's better than when you just send it, [because] there's a bit high likelihood people aren't looking at it and reading it.”

Lola: “I feel like in the bigger conversation, I get a deeper understanding of the data because of the conversation that's happening in the questions that other people are asking that allow me to see things that I may not have seen if it was just me in a room.”

Although the statements are expressed differently, the core meaning in both is how an essential feature of the experience is the ability to ask and listen to questions. I continued this process until I clustered all statements by shared meaning units (see Appendix F). I re-read the statements in each meaning unit again and used a mind map tool (Cmap) to list all the meaning units to cluster them. During this process, I thought through the connections among and relationships across the meaning units to create clusters and then synthesize the clusters to begin developing themes. After reflecting, I created themes and wrote summaries for each theme that presented a *thematic portrayal of the experience* (see Appendix G). Participant quotes presented in the portrayals of experiences one to four are from the interviews, while quotes in the portrayal of experience five are from the last photovoice discussion. Names presented in the narrative are pseudonyms.

Portrayals of the Experience

Portrayal of Experience 1. Participants experience initial reactions, anticipation, assumptions, and group dynamics before, during, and after the data sensemaking brief.

Participants experience various reactions that manifest as assumptions or anticipation about the data briefs. These reactions can support productive outcomes from the data sessions or become barriers to engagement and understanding if gaps in perception persist and are significant. Confronting those anticipated aspects with a positive contrasting experience minimizes their potential for undesirable impact.

Prior: Participants used the information they gathered prior to the data sensemaking to anticipate certain things about the experience or to create assumptions. For example, agenda information such as time allocation, the topic of the brief, or the inclusion of non-data features (e.g., reflection, non-data topics) informs positive or hesitant reactions depending on the individual's perspective. For example, some anticipated the time allocation as 'just right' while others perceived it as 'too long.' Sofia shared, "It's interesting. At first, it felt like, gosh, there's a lot of time set aside for this, and then once we started getting into the conversation, I felt like I wish we had another 15 to 30 minutes to spend on this because there's a lot there."

The three data briefs presented focused on three of the five Key Performance Indicators (KPIs) the institution established in the Fall of 2021. The team received infographics with each measure and respective trends in F21 and F22. The Chancellor had asked the team to align their departmental efforts around the KPIs. Before the CSDBs, they had not received any related analyses. The presentations covered 1) the dual credit conversion rate, 2) the enrollment growth rate of students 25 and older, and 3) the credit completion and DFW rates.

For some, the topic sparked curiosity, while others reacted defensively or with surprise. Gabi said, "The only part that becomes a little frustrating is when it's like a surprise...I didn't know the data was being run."

Non-data elements are perceived as stimulating or met with curiosity, while other participants think of them as out of place. For example, Amanda said, "For me, from a business operations standpoint, I feel like my time is more effective if I am doing rather than discussing my emotions or how I feel."

During: During the briefs, participants are simultaneously processing various elements of information that combined inform their overall perception of the experience.

Depending on preferences or personality, engaging with new (quantitative) data in real time created discomfort as they tried to grasp new information at the moment. Gabi recounted, “It's like walking in, and I'm trying to grasp it in the moment where I haven't digested it.” Sofia expressed a similar experience, “I think the most challenging piece was again...to have the information at the moment and try to make sense of it.”

From each participant's perspective and background, they judge whether the quality of the information is sufficient, whether the presenter includes enough context, and whether visual aids are engaging and support their understanding. Amanda observed, “I liked the graphics for sure...the charts, for me, that's always helpful. And I think the videos were helpful.” She explained further, “The work was great. Your material was great. The quality was there ... It was valuable information for me, but I think...we're not all in the same world of work and understanding of some of the data.” Although this inquiry focused on presenting quantitative data, she lamented that it included “just numbers and not the qualitative portion.”

In parallel, as part of group dynamics, they are ‘reading the room’ to gauge colleagues' reactions and attempting to evaluate if others are having a similar experience. Lola remembered, “But then I realized that I wasn't the only one in the room feeling that way, and questions started to be asked. And I was like, oh, okay, now I get it.” Sofia explained, “It was...a combination of both those things...tempering my enthusiasm...and being mindful not to bring the conversation in that space with those people at a level that was more advanced than they were.” Furthermore, Gabi shared, “I don't like sitting in when there's tension in there; I think we should be talking about it.” Lola summarized that it was “very distracting to try to read the room or your environment versus focusing on what's being said.”

After: Participants' actual experiences during the briefs become evidence to support or disprove their anticipations and assumptions, leading them to form an opinion about the overall experience. Frankie summarized his experience this way: "I enjoyed it. I mean, I think a lot of those things are things that, based on my role on campus, I don't necessarily see a lot of those things." Dani summarized his experience with a more nuanced description: "I don't know if I can use the word enjoy because sometimes the information posits uncomfortable truths. But I thought that they were very engaging. I thought that the principles and information and ideas and data were presented really well and presented for very thoughtful discussion".

Portrayal of Experience 2. Participants experienced contradictory perceptions of reflection in the process of collective data sensemaking

Among this group, participants had a paradoxical experience with reflection. Perceptions of reflection originate from personal preferences. Some already had a positive general disposition toward reflection. Sophia stated, "For me...having that reflection time like before and or during and or after is very helpful." Dani also expressed positive opinions about reflection: "I think that's...necessary for almost anything you do ... reflection's kind of an important part of that process." Nevertheless, for others, reflection was perceived as a 'non-business' activity taking away time from 'doing' or thought of as 'unproductive' time. Nevertheless, even for those without a disposition toward reflection as part of a professional or leadership practice, there was consensus that the reflection sessions were 'very helpful' and 'collegial.' Amanda shared, "This is my personal thing. I don't feel like it's productive for me." However, she also said, "I thought those were actually very helpful, and I thought they helped frame what we were doing...I thought they were actually good." Recalling the session on the ladder of inference, she explained further, "it just reminded me again of the importance of

bringing more stakeholders than one person to a conversation...taking a step back to recognize where people are at and that sometimes things that appear on the surface, there's so much more beneath that...I thought that was actually a very good approach to start.”

Still, for those with positive dispositions, engaging in reflection as a group produced conflicting emotional reactions during the moment, such as vulnerability. Sophia explained that “it felt scary...I felt a little vulnerable. It pushed me out of my comfort zone,” but “as I did it, and as others did it, it was also very opening, and also I think it helped to continue [to] foster that understanding of each other and professional trust and willingness to go side by side...with the team.” Several other participants explained how they thought the reflection sessions supported creating connection and cohesiveness across team members, increased understanding of diverse perspectives, and ‘set the tone’ for the (quantitative) data presentations. Despite contradictory feelings and perceptions of reflection, all participants agreed on the positive outcomes of reflection for the group and the contribution to the data discussions.

Portrayal of Experience 3. Group sensemaking is integral to expanding the diversity of perspectives and understanding and planting the seed for deeper analysis and action.

Reasonably, a professional role is one of the initial filters leaders use to approach and make meaning of new data. Gabi explained, “[It] is hard sometimes for me in the sense that a number of them...fall under my umbrella.” Sofia acknowledged that “given the various roles I've played on campus, I think my perspective may be a little bit broader than most positions. But it's still very singular.”

However, as they come together in a shared space, the ability to ask questions becomes a catalyst for richer discussion. Participants begin by asking clarifying questions

or inquiring for additional explanations. These questions highlight differences in perspectives fueling the group discussion to help transition from individual sensemaking to group sensemaking. All participants recalled how having different perspectives in the group discussion was beneficial. Lola highlighted, “I benefit from...the different perspectives and the different questions that come up throughout ... Because, again, it may be areas that we don't fully understand that are more specific to other areas on campus than our own, but the questions and the conversations that come up from some of those different areas, [they] allow me to have a better understanding of the data and to see things from different perspectives. So, I appreciate others in the room because, to me, it really enhances the conversation.”

Dialogue typically starts between the participant and the presenter through question-answer opportunities but then grows to group discussion as participants engage in dialogue, ask questions, and provide perspectives among each other. Sofia explained how the process “was really, really helpful,” describing how I “shared a bit, stop and discuss, go onto the next piece. And then also what was really helpful, there were a few times that ...we were looking at a few slides in, and we would jump back to a previous slide and data point. Doing that helped us as we moved through it; it opened up additional questions about an earlier data point and increased...understanding as we were moving through it. Then, for me, it also gave an increased understanding of the previous ones and how they all are interrelated.”

Some react emotionally to data, which they weave into their understanding. Amanda described her reaction to some data presented: “[it] was just a little bit disheartening. I would hope that we'd have higher numbers.” Sofia also called it “heartbreaking,” saying, “It was devastating to see how low the outcomes were and how much the enrollment has dropped and then not picked up.” But, she then reframed those

feelings, “Overall, what has really shifted in all of this is the internal transformation... how I have the responsibility and the weight of that, but [also] the excitement and the empowerment...I feel like I have this huge opportunity to really impact change.”

The presence of multiple perspectives and ways to approach data sensemaking causes each participant to consider different understandings and relevant contexts, which expands understanding for all. Frankie noted that “it was nice being able to digest it as a group and being able to discuss it. A lot of times, people have specific comments that perhaps if I would've just read it on my own, I would've never considered those perspectives that those folks brought up. So, certain things that were specific to their areas could help explain to us perhaps why certain things were the way they were. So, I think that was very helpful to be able to listen to that as a team.”

Greater understanding leads to additional and more complex questions and motivations for exploring actions that can make a difference. Sofia reflected, “I think because I had at least that basic foundation of understanding institutional data, I was able to... move more quickly to ...what does this mean and how does this inform our practices?” Lola talked about growing more comfortable with data, saying, “I've gotten comfortable enough to not just take it for what it's worth, but also say, okay, let's dig one step deeper.” Emma highlighted that her “favorite parts were the data parts where we were really digging in and getting something out of it.”

Portrayal of Experience 4. Participants adjust or advance their perceptions of IR due to their engagement in sustained and structured communication.

Participants experience IR differently during these sessions because they go beyond the transactional or client relationship. It widens perceptions of IR because it highlights the wealth of information available to IR that goes beyond a specific reporting

request and showcases a broader range of skills. Gabi recognized, “I probably understand it more when you're presenting it, and we're talking about it.” Participants experience data as part of a cohesive story relevant to their work rather than as isolated data points they need to complete a task. Sofia expressed that “when we have the opportunity to get the perspective and the insight of someone like you who is in it all the time, who has the context of other things happening on campus and how one thing impacts another...when you say in the group sessions, for example, this is what this means to me, and here's ... a context to understand about how this data was pulled and why, it helps fill in the story.” Emma outlined, “Part of what you were showing us in the sessions was something that you believed warranted attention. A question that you were asking, or maybe it was more than a question. Maybe you had an idea that we needed to be paying attention to something. And I believe that's your function.”

When participants feel they understand the data and have a positive experience during the data briefs, this helps dismantle IR stereotypes. Amanda shared how she perceived IR (my role) as different from what she had experienced elsewhere, saying, “I see it as something positive knowing that a data person is more than just, you know, a techy geek or somebody behind a computer, crunching numbers.” She recounted, “I've seen data folks involved...where the data gets requested or when it's being presented to interpret. But you're taking a very high leadership role in all areas of the campus, and that's unique to a data person ... it's new to me to have a data person being involved at so many different levels instead of just data.”

Some participants may also realize that IR can be a partner in scaffolding data sensemaking and feel less intimidated or anxious to ask for support. Additionally, it may help support their confidence in their own understanding. Frankie said, “I personally didn't do this, but I think if I would've had any additional questions, I could have

followed up with you, and you'd have been happy to explain or discuss further.” Sofia appreciated having scaffolding through the data sensemaking process, “I appreciated [the way] it was presented...here it is, and this is a discussion about what you all think about it, what are your reactions, and what does this means to you with some [of] the guidance that you've given about here's the numbers, and this is what we're looking at...To me, it wasn't you sitting in front of the room saying, this is the data, this is what it means, and this is what we need to do. It was a very collaborative group dialogue where everybody that wanted to had an opportunity to share their reflections, and to ask questions, and to participate.” Amanda summarized her current perspective as “understanding, that you're accessible and that you know how to tell a story with data ... you can tell a very good story with data.”

Analytical Process for Research Question 2: Leaders’ reflections on their professional responsibilities toward equitable student outcomes

To gain insight into how leaders experience their responsibility toward student equitable outcomes, it was important for participants to have an opportunity to engage more fully in that reflection and, since we are colleagues, to be able to do it anonymously. This would minimize the pressure for participants to participate in the discussion if they chose not to and allow them to be more selective with what they wanted to share with the team. Their written reflections would also provide data to be integrated into the phenomenological analysis. However, the exercise ultimately happened differently than expected. Hence, I start by providing some context.

One week prior to the first CSDB, I sent instructions to the participants about collecting an image that conveyed what it felt like to them to be professionally responsible for equitable student outcomes. They also wrote a reflection about it (see

Appendix D). They submitted both artifacts via Qualtrics a day before the sessions began. The first CSDB was intended to discuss the images and their reflections.

Six of the nine participants submitted the image and reflection. Nevertheless, most reflections were significantly shorter than one page (see Appendix H). Still, as planned, two discussions about this exercise were held in the first and last CSDB sessions.

The participants' reflections focused primarily on conveying their understanding of the importance of education, diversity, and equitable student outcomes rather than *reflecting on their experience or feelings* of having that as a professional responsibility. For example, one participant shared this reflection:

This particular image caught my eye and made me think about a quote that inspires me. "Even broken crayons can still color." To me, this image speaks about diversity. Just like the colored pencils, we are all different. It reminds me that in spite of everything that a person has done or been through, they still have purpose and value... Advancing equitable student outcomes is probable by empowering student success, allowing students to color their world with their very own colors, embrace diversity, hold students to high expectations, provide inclusive learning environments that ensures all students have access to the resources needed for success.

Figure 9

Image Submitted by Participant: Color Pencils



Another participant who selected the photo of a garden expressed:

The gardener is ultimately responsible for the well-being of every plant. S/he can't blame the plant for not trying hard enough. And every plant needs to thrive—some plants need something a little different to thrive, more or less water or sun or nutrients. Knowing about that and taking care of that is the gardener's talent, and responsibility and joy.

Figure 10

Image Submitted by Participant: Gardener



Consequently, the written reflections did not yield text data that could enter the main phenomenological analysis. Therefore, I adjusted my approach. To examine this question, I used the following process:

1. I re-watched and listened to the CSDB discussions #1 and #6, paying particular attention to the participants' comments and writing down quotes when they expressed something specific about their experience and feelings. I compiled all of these quotes into a single document. I also reread related observations and memos.
2. I transcribed notes from the participant exercise done in CSDB #6 into a single document and compiled a comprehensive list of feelings they reported and the frequency of those feelings across the group members.
3. I organized these data to highlight similarities and comprehensively account for how each participant reported their experiences.
4. I synthesized all of these data and observations into a single portrayal of experience.

Even during the first CSDB discussion, when participants were asked to discuss the images, they struggled with expressing their thoughts about their own experiences. Eight of the nine study participants were present during the first discussion, but three did not share any comments. However, some shared reflections about their experience writing the reflection and recounted past experiences. Still, towards the end of the discussion, it became clear they had a better understanding of the purpose of the exercise. The first participant to comment focused on the experience of writing the reflection: “There was all of this anxiety around it...then I started writing...[and] there was a flood,” a realization of “I do have a lot to say about this.” She further explained that “it was therapeutic, almost” and described that it was like “getting it all off your chest.” She recounted the sensation at the end of writing, “Wow, that felt good.”

A second participant compared experiences from earlier in her career to current work around equity. She provided examples of how the work around equity was

happening, but “we were figuring it out.” She thought, “I feel like equity has always been part of the work, but now we have conversations, we have preparation, we have resources, we have training,” and added, “I’m so grateful for that.”

A third participant shared the experience of driving into our campus on his first day on the job and having “empowering and humbling” feelings. He shared very moving life and professional experiences from his past that formed his firm belief that “the difference is education. It is the only thing that is truly going to get you out of poverty.”

Three participants shared thoughts about the images displayed on the screen. One expressed that she “loved” the garden picture because of the “thought of fostering an environment where students can grow.” Later, toward the end of the discussion, she reflected, “*seldom we are asked...we all have an individual or shared understanding about what our role in higher education is, but then, to be asked about how we feel about our responsibility and our role in higher education; it just completely shifts it.* [emphasis added].” Another participant added, “you become complacent, and when you really stop and ask a question and you focus on it, it’s amazing how passionate we are about the work we do...it gets you excited about the work.”

Although only one participant addressed how he felt about his professional responsibility around equitable student outcomes, participants better understood the question posed in the reflection prompt. They had meaningful reflections as we prepared for the data sensemaking sessions. Notably, this conversation and having weeks of additional reflective time before returning to this discussion helped participants be more focused when we revisited the images during the last CSDB.

Given the outcomes from the first exercise, I made some adjustments. To keep the conversation focused on their feelings and experiences, I added a word cloud image for the last session that showed potentially positive, neutral, or negative feelings leaders

may feel (Figure 11). I explained how these were only some examples and that it was not meant to be an exhaustive set. I emphasized that during their reflection, the focus was on their feelings and experiences, which may not be reflected in the examples.

Figure 11

Examples of Feelings Leaders Might Feel



At the beginning of the sixth session, I showed the same collection of images to the team. All nine participants were present. They spent a few minutes reflecting and jotting down thoughts on a handout that included the word cloud and the questions:

1. What does being professionally responsible for advancing equitable student outcomes feel like? Why? (You may identify a feeling(s) from the word cloud or any other feeling you experience).
2. Data presented in the IR data briefs showed measurable and significant outcome gaps by race/ethnicity and gender among our students. What feelings do you experience when you think about systemic outcome gaps among UNM-Taos students and your leadership role at UNM-Taos?

After a few minutes of thinking about these questions, we began the discussion, and I collected the handouts at the end of the session. The handouts did not have names and were placed on an envelope. To clarify, I did not ask participants to write a reflection. The handout was meant to be a tool for them to quickly organize their thoughts to prepare for the group discussion.

Six participants shared a wide range of *positive and neutral feelings* for the first question. *Three* participants included *positive and negative feelings* (see Table 10). The most commonly shared feelings were *pride* and *obligation*. Other positive and neutral feelings included a sense of purpose, responsibility, empowerment, excitement, the importance of their work, feeling honored, mindful, driven, and inspired by their responsibility toward equitable student outcomes. Most participants talked about a sense of pride when they see students succeed. For example, one participant wrote, “Seeing students being successful gives me a sense of pride, as I know this can be life-changing for certain individuals.” Similarly, a second one expressed a “sense of pride when students are able to accomplish a goal they set for themselves.” Another shared, “I am honored to be chosen to handle this responsibility, and feel a sense of empowerment, obligation, and pride.” A third one explained, “[I feel] both an obligation and opportunity. We should all feel obligated to advance and better our society, but not everyone has as clear an opportunity as people in an educational field.”

Additionally, two participants shared feelings of frustration; one shared feelings of trepidation and feeling overwhelmed, and another felt challenged, scared, anxious, and nervous (see Table 10). Some expressed frustration with others when they “say equity is important but lack follow through” or expressed needing or having limited resources. A participant wrote, “sense of frustration we have not been able to remove obstacles that keep students from achieving their goals.” Another one expressed, “need more capacity and time ... underequipped with staffing.”

Table 10*Responsibility for Equitable Outcomes: Feelings Reported and Frequencies*

Positive	Frequency	Neutral	Frequency	Negative	Frequency
Pride	5	Obligation	3	Frustration	3
		Sense of			
Empowered	3	responsibility	2	Anxious	2
Purposeful	2	Mindful	1	Overwhelmed	1
Feels important	2	Challenged	1	Nervous	1
Excited	2	Driven	1	Pressure	1
Satisfaction	1			Stress	1
Motivation	1			Trepidation	1
Honored	1				
Opportunity	1				
Inspired	1				
Emphatic	1				

When responding to the second question that focused on outcome gaps among UNM-Taos students, six of the nine participants shared feelings of *frustration* (see Table 11). Other emotions included feeling upset, angry, helpless, ineffectiveness, anxiety, lack of energy, sadness, responsibility, and overwhelmed. For example, a participant felt “frustration at seeing the difficulties of people of color at achieving higher education. Frustration with the PED [Public Education Department in NM] systems and their failure to prepare these students for higher ed.” Another participant wrote, “[It] can bring on feelings of helpless and ineffectiveness...sometimes anger over not being able to move the system.” Another expressed “frustration with how to address gaps.” Few also wrote positive feelings, including feeling motivated, challenged, curious, and engaged. A participant mentioned “satisfaction with becoming knowledgeable and working as a team to come up with resolutions to better serve our students and being aware.” Another

shared “motivational feelings to improve and make changes.” One participant did not express having negative feelings, saying:

I experience a feeling of focus and urgency. I don’t feel stress or pressure because I know that these numbers are not unlike those at other institutions, but I do feel a need to help our team and departments figure out strategies that will effectively close those gaps for our students.

Table 11

Thinking about systemic outcome gaps: feelings reported and frequencies

Positive	Frequency	Neutral	Frequency	Negative	Frequency
Empowered	2	Curious	1	Frustration	6
Motivation	2	Challenged	1	Anger	3
Focused	2	Responsible	1	Helplessness	1
Engaged	1	Urgency	1	Ineffective	1
Satisfaction	1			Anxiety	1
				Lack of energy	1
				Overwhelmed	1
				Upset	1

Five participants shared their thoughts with the group during the conversation, echoing the feelings reflected in the handout notes. There was almost a somber mood in the room as participants began sharing their thoughts. Everyone was quiet and listening carefully. As one participant finished, there was a silent moment before someone else began sharing their thoughts. One shared, “It’s a great responsibility that weighs heavy on my shoulders...it can be stressful and frustrating,” but she said, “All of those things

also tend to motivate me. There's a sense of determination and motivation." Another participant talked about experiencing "polarized feelings" and described how his focus was on overcoming negative emotions. He added, "I think it would be harder if we were in a place where we never saw positive change." Two other participants talked about experiencing more positive feelings. One talked about the opportunity to "being able to sit at this table," explaining, "having the opportunity to be part of it. I'm very grateful." Another participant expressed, "For me, there's a sense of pride in being offered the opportunity to sit at the table and make decisions that have to do with student success." She reflected on changes in attitudes around how basic needs and disabilities are approached now versus earlier in her career. After the discussion ended, there seemed to be a collective 'deep breath,' the room's mood became lighter and more familiar, and the team moved back to business.

Portrayal of Experience 5. Administrators struggle to verbalize their feelings or experiences of being responsible for equitable student outcomes.

Overall, it was challenging for UNM-Taos administrators to relate how they experience the professional responsibility for equitable student outcomes. They are more readily able to share their thoughts on the importance of education or equity in education. However, through discussion and scaffolding, they began considering the feelings they experienced from being professionally responsible for equitable student outcomes. Generally, administrators conveyed more positive feelings about their sense of responsibility toward equitable student outcomes, particularly a strong sense of pride and obligation. Nevertheless, those feelings are complex and span a wide range. Most leaders expressed polarized or complicated emotions, particularly when considering

existing outcome gaps. When the attention turns to existing outcome gaps, those feelings turn more negative, where feelings of frustration and even anger are more prevalent.

Findings to Research Questions

Phase one, the phenomenological analysis, allowed me to understand how leaders experienced the data sensemaking process through the CSDBs and how they experienced their responsibility toward equitable student outcomes (see Table 12). The research questions' findings are presented below.

Table 12

Research questions and corresponding portrayals of experience

Research Question	Phenomenological Analysis
RQ1 – How do senior administrators describe their experiences engaging in group discussion and personal reflection to make sense of data (participating in the CSDB)?	<p>Portrayal of Experience 1. Participants experience initial reactions, anticipation, assumptions, and group dynamics before, during, and after the data sensemaking brief.</p> <p>Portrayal of Experience 2. Participants may have contradictory perceptions of reflection in the process of collective data sensemaking</p> <p>Portrayal of Experience 3. Group sensemaking is integral to expanding the diversity of perspectives and understanding and planting the seed for deeper analysis and action.</p>
RQ2 – How do senior administrators at UNM-Taos describe their professional responsibility in achieving equitable student outcomes?	Portrayal of Experience 5. Administrators struggle to verbalize their feelings or experiences of being responsible for equitable student outcomes.

Research Question 1 – How do senior administrators describe their experiences engaging in group discussion and personal reflection to make sense of data (participating in the CSDB)?

Leaders described complex and comprehensive experiences participating in collective reflection and data sensemaking. Reactions and assumptions begin even before the CSDBs occur as administrators consider time allocations, topics, and the nature of the discussion. They integrate information provided by their colleagues and pay attention to non-verbal cues to assess whether others are interpreting the information similarly or having similar reactions. Although all participants agreed on the significant positive outcomes of collective reflection concerning building team connection, consensus, trust, and supporting the data sensemaking process, they also had contrasting perspectives on whether reflection should be part of the team's professional practice and experienced feelings of vulnerability and apprehension. Similarly, administrators unanimously perceived the data briefs as a positive and meaningful experience to support their sensemaking and to inform actions. However, they had different opinions on the appropriate time investment for this effort or the opportunity cost of their time. Participants emphasized the ability to ask questions, receive additional explanations, and the presence of diverse perspectives as the most helpful in expanding their understanding and supporting their data sensemaking. In parallel, there was consensus that they benefited from the scaffolding process led by IR and believed it supported a more nuanced understanding of the data.

Research Question 2 – How do senior administrators at UNM-Taos describe their professional responsibility in achieving equitable student outcomes?

Although leaders could readily share their thoughts regarding the importance of education or equitable student outcomes, communicating how they experience the responsibility for equitable student outcomes was more challenging. They experienced this question as unexpected as it shifted the focus to their experiences. Some participants expressed anxiety when thinking about the question or experienced answering it as almost therapeutic. Others recounted deeply personal or professional experiences that now inform how they understand this responsibility. Still, administrators expressed having multiple and sometimes polarized feelings. Generally, administrators conveyed more positive and neutral feelings about their sense of responsibility toward equitable student outcomes, particularly a strong sense of pride and obligation. Those feelings, however, turn more negative when thinking about existing outcome gaps when feelings of frustration and even anger are more prevalent. Those negative emotions are typically responses to others they perceive as not committed to eliminating the gaps or to socioeconomic or institutional systems that act as barriers. Some participants shared how they focus on the more positive feelings to overcome the more negative emotions. In contrast, for others, those negative emotions served as a source of motivation and commitment toward pursuing equitable outcomes.

Data Analysis Phase Two: Thematic Analysis

Analytical Process for Thematic Analysis to Inform Evaluation of Case Study

Propositions

The second phase of the analysis was conducting a thematic analysis of the full content of the interview transcripts to facilitate the evaluation of the case study propositions. I started the analysis process by loading all the transcripts into Dedoose. Keeping with the phenomenological approach, I used InVivo coding to identify words or small phrases that were meaningful to the participants' messages. This resulted in a large number of InVivo codes (N=427). I applied Values Coding to relevant excerpts during the second round, yielding fewer codes (N=77) (Saldaña, 2021). Then, I used the Codes Mapping technique to initiate the data reduction process, which resulted in 41 categories and 7 clusters (Saldaña, 2021). A sample from the coding process is presented in Appendix I to illustrate the data reduction process. Additionally, examples of the categories and clusters are provided in Appendix J.

Furthermore, I used the categories and clusters and revisited the memos and observations to synthesize the findings into themes. Additionally, as I thought about connections to create the themes, I reviewed the results from the phenomenological analysis to check for convergence or potential contrasts. Overall, both analyses were closely aligned and supported each other. Throughout the coding and analytical process, I also consulted *The Coding Manual for Qualitative Researchers* to ensure I had a clear understanding of the coding, transition, and theme generation processes (Saldaña, 2021). Through this process, I was able to identify four themes.

Theme 1. Collective data sensemaking expands understanding.

Collective data sensemaking is a complement, not a replacement for, individual data sensemaking. Most participants prefer having “some study time” with the data

beforehand. Nevertheless, Gabi acknowledged that "when you just send it, there is a bit high likelihood people are not reading it." Allowing for individual sensemaking to take place acknowledges administrators' preferences. However, structuring group discussion ensures that all participants see and engage with essential data even when they choose not to engage with the material sent via passive methods (e.g., email). All participants discussed how "that group conversation around it builds [their] understanding." The data and dialogue result in sensebreaking when it contrasts individual sensemaking and existing understanding. Sofia reflected, "This is the story that we think we know, but this is what is actually happening." The data and discussion become "information in their toolbox." Or, it may act as sensegiving as it also builds "awareness" and consensus around the team. Lola explained, "The admin team [is] representing the entire campus ... everybody needs to know." Without the discussion, some team members may not engage with specific data because of their professional role. For example, Frankie said, "I don't necessarily see a lot of those things." Considering new information expands understanding. Lola noted that the CSDBs "got me to think of things that maybe I wasn't thinking." Emma acknowledged that before the CSDBs, "it wasn't clear to me we had a gap." Administrators value the diversity of perspectives present during the discussion. Sofia shared that there was a "huge value ... to review it together ... with different perspectives and priorities." This included perspectives from team members who do not have academic or student services responsibilities. Emma remarked, "Adjacent perspectives can bring value and insight too." Lola observed that the data presentation and discussion "it sparked things, different things in different people." Frankie summarized that otherwise, "I would've never considered those perspectives."

Theme 2. Reflection and scaffolding data sensemaking advances equity understanding and reinvigorates commitment to closing equity gaps.

Reflection, studying, and discussing the data helps administrators refine and advance their understanding. Emma remembered, “The one that really sticks with me the most was around looking at some of the numbers of young women...it was only through that data that I started to think differently about the population.” Similarly, Frankie said, “I think it made me think a little more about those groups that perhaps are underrepresented in their enrollment or graduation. I mean, I've known it, but I guess I didn't really see the magnitude of the disparity between the groups until those data briefs.” Amanda also highlighted, “Maybe not the fact of issues around participation of Native Americans, but just the magnitude and the trend of it.”

Speaking about outcome gaps for Hispanic and Native American students, Sofia expressed, “It's alarming to see the gaps when we're looking at enrollment, let alone retention and graduation rates. And at each of those levels, there's a bigger and bigger disparity.”

Dani explained that the data and reflection sessions were important because “I get so focused on the task itself, I stop thinking about why we're doing it...you lose sight of the forest for the trees.” Moreover, when you detach from the motivation and become solely centered on the task, “it's kind of an empty action.” So, the CSDBs “can help guide you to prioritize things within your own specific projects.”

Sofia expressed that “the time for reflection is important because we are so, so busy that...we have these amazing briefs, we have this great dialogue. It's stirring up and bringing up a lot of ideas and a lot of questions and a lot of what ifs or a lot of what does this mean? And without that, then I get onto the next series of things.” She also talked

about how it was important for the team to dedicate more time to inquiry and “put together a plan of action.”

The data briefs can spark curiosity and motivation to learn more and identify actions. Lola described, “I feel like the data has created opportunities to see where those barriers may lie...it was a real eye-opener...I think I've gotten comfortable enough to not just take it for what it's worth, but also say, okay, let's dig one step deeper...these opportunities have given me the confidence to be able to dig deeper.”

Dani described ways in which the CSDBs helped him think about focusing his departmental efforts and how the sessions “create some exigency around what I'm doing personally. It obviously gives me more specific ideas on the [target] demographics.”

Lola reflected, “Some of it is really hitting home to me. I feel like before, I would've just been like, oh yeah, we listen to data. [Now] I'm really bringing it back to my work and digging deeper. I'm sitting there...okay, red flag, that's a huge red flag for me. I need to revisit that, and I'm marking the things to say...[or noting] this is a discussion that I need to have with my team.”

Theme 3. Engaging in group reflection supports focus and connection.

Dialogue requires trust, so engaging in group reflection helps create connections among the team. As Dani put it, “getting us to that place where we're ready to even discuss what is important.” Reflecting together “gives an idea of their [each team member] value systems.” Sofia explained how those conversations “continue [to] foster that understanding of each other and professional trust.” Gabi remarked that the experience was “collegial.” Lola could “see how there was very much a common theme” in the discussion. Dani remarked that “it provides diversity of seeing things from a different perspective, and it also helps people understand other people...different capacities, and passions, and motivations.”

Emma observed, “We don't have a lot of time to sit and reflect together, and I think that was something that was really positive from [the CSDBs].” She explained further, “I appreciate the way that we work together when you have data, and you're like, we really need to pay attention to this...and use that process of slow to really build the understanding and then inform the practice.”

Reflection also supports reconnection to one's personal and professional purpose. For example, Gabi shared, “I feel like we impact students' lives.” Sofia talked about how thinking about the issues affecting underserved populations and looking for solutions “brings significance to my work.” Frankie recounted having “the same background as a lot of our students.” He said, “I was one of those students.”

Theme 4. IR can leverage scaffolding data sensemaking to bring focus to equity gaps while simultaneously supporting more comprehensive perceptions of the IR function.

Scaffolding the data sensemaking is helpful to the receiver because of the asymmetry of expertise. As Dani explained, speaking about himself and other colleagues, “Despite having information at your disposal, it may not be quite enough for you to completely understand a situation because of your limited experience.” Speaking about the CSDBs, Sara said, “Being able to have the opportunity to participate in the data briefs has given me more tools to work with because it's in a way that I can understand.” She elaborated, “It makes me excited to be part of that...it's been done in a way where I can understand it to the point where I can implement it in the daily work that we're doing here.”

Sofia described how the scaffolding process supported her understanding, “so we're starting with a broad set, and then looking at, this is how it's sliced and diced, and disaggregated. And then looking at another piece of data and how it was potentially

impacting the next piece of data or vice versa. So, in looking at all those pieces, you [were] the storyteller to kind of weave it all together.”

Emma observed how the “briefs became more tailored to that audience, and you became aware of their tolerance for...openness. As a group, they're a group that wants to make sure they're understanding your point, your questions...the data you're putting in front of them. They're not a group that is probably gonna be super tolerant of big exploration...they want road signs...that was a feature that you started to bring...a little more focused, a little tighter questions, fewer data points.”

The scaffolding process also helps support a more comprehensive understanding of IR. Amanda explained that the CSDBs helped her understand that “you [IR] just have a wealth of information and interest, and you're willing to help us in our decision-making and keep everything data-centric.” Sofia remarked, “Data on our campus is completely different than what it has been.” Lola expanded her observations beyond the CSDBs to the last few years, saying, “I think I've mentioned this to you before. I feel like one of the areas where I've really grown since you came on board is in the data piece...I made reference to a student earlier about not seeking support because you don't want people to know you're not...I feel like that was very much me in the data world.” Frankie was able to identify IR as a resource, explaining that “if I would've had any additional questions, I could have followed up with you. And you'd have been happy to explain or discuss further.”

Evaluating the Case Study Propositions

To present the case study findings, I draw from the thematic analysis to compare the “empirically based pattern...with the predicted one,” also called “pattern matching” (Yin, 2018, p. 215). The focus is to establish the patterns of how senior administrators at UNM-Taos engage in data sensemaking. Pattern matching helps the researcher identify

contrasting evidence or significant areas not part of the propositions. Table 13 aligns the case study propositions with the themes from the analysis.

Table 13

Alignment of Case Study Propositions and Themes

Case Study Thematic Analysis	
Case Study Propositions	Themes
<p>P1 - Lived experience and professional roles are active filters by which leaders process data/information. However, engaging in group sensemaking may produce a more profound and robust understanding to inform action.</p> <p>P2 - Consistently consuming data crafted using an equity lens during structured times facilitates the transition from passive information intake to co-construction of knowledge that results in more comprehensive and nuanced sensemaking, which motivates action toward addressing student equity gaps.</p>	<p>Theme 1. Collective data sensemaking expands understanding.</p> <p>Theme 2. Reflection and scaffolding data sensemaking advances equity understanding and reinvigorates commitment to closing equity gaps.</p> <p>Theme 3. Engaging in group reflection supports focus and connection.</p>
Implicit Case Study Proposition	
<p>Integrating an equity-minded lens in the IR analytical processes and leading the scaffolding data sensemaking among administrators can help</p>	<p>Theme 4. IR can leverage scaffolding data sensemaking to bring focus to equity gaps while simultaneously supporting more</p>

advance student equity understanding and redefine the IR function as a change agent leader.

comprehensive perceptions of the IR function.

Portrayal of Experience 4.

Participants may adjust or advance their perceptions of IR due to their engagement in sustained and structured communication.

Both the phenomenological and the thematic analyses yielded findings about the role of IR in scaffolding the data sensemaking process and advancing the IR role to a change agent leader (Table 13). Although the study did not include explicit research questions or case study propositions, there was an implicit proposition as the purpose of my inquiry and problem of practice was anchored on rethinking the role of IR and leveraging it to support data sensemaking and advance student equity understanding among senior administrators. The empirical evidence from this case study supports the assertion that IR can be positively leveraged to advance data sensemaking and student equity understanding. As detailed earlier in the portrayal of experience and theme discussions, administrators expressed how having the institutional researcher provide explanations, context, and highlighting the connections between various data supported their sensemaking process. They also shared how their perceptions of IR are becoming more nuanced than common stereotypical perceptions of IR.

Next, I evaluate the two case study propositions below.

Case Study Proposition 1 - Lived experience and professional roles are active filters by which leaders process data/information. However, engaging in group sensemaking may produce a more profound and robust understanding to inform action.

Participants expressed how their professional roles or lived experiences were a factor when engaging in data sensemaking. Some even perceived others' level of engagement to be determined by their professional role. A participant explained, "My experience was probably more unique than it was for most of the other members of the admin team, just given the fact that I had [because of previous roles] at least that basic foundation understanding institutional data. I was able to move more quickly to the, okay, what does this mean, and how does this inform our practices?" Another participant related engagement to professional roles: "[when] people are coming from specific departments, you're always gonna have those who work directly with the information and those who, it's more of an information piece." Yet another expressed it similarly, "it just depends on your role. I think that determines the level of engagement." One participant expressed how her role affected her attitude toward the CSDB: "[it] is hard sometimes for me in the sense that a number of them are presented on areas that fall under my umbrella." A couple of participants also connected their life experiences to the students represented in the data, "I was one of those students."

All participants expressed how engaging in collective data sensemaking helped them increase their understanding or awareness. For example, Sofia explained, "For me, it allowed it to be integrated a little bit more because there's questions asked from people that are in different departments or have a different understanding or have different priorities on campus than I do. So, there were instances where I wasn't thinking about something or the story that I was garnering from the data was very different or had a

different meaning or impact than what someone else brought up. So, there was a huge value in that being able to review it together as a group with different perspectives and priorities. I think it enhanced my own understanding of it.” Similarly, Frankie expressed, “It was nice being able to digest it as a group and being able to discuss it. A lot of times, people have specific comments that perhaps if I had just read it on my own, I would've never considered those perspectives that those folks brought up. So, certain things that were specific to their areas could help explain to us perhaps why certain things were the way they were. So, I think that was very helpful to be able to listen to that as a team.” Several participants also talked about considering next steps and opportunities for action. Dani talked about the team “working together and coming up with...different sets of ideas that could be...synthesized into a single plan of action...getting people focused.” Sofia focused on student populations experiencing inequitable outcomes and making efforts to “find out their whys and maybe put together a plan of action, both academic and other supports.”

In summary, the empirical evidence produced during this case study strongly supports this proposition.

Case Study Proposition 2 - Consistently consuming data crafted with an equity lens during structured times facilitates the transition from passive information intake to co-construction of knowledge that results in more comprehensive and nuanced sensemaking, which motivates action toward addressing student equity gaps.

Engaging with data crafted with an equity lens focused on highlighting inequitable outcomes raised awareness and urgency about the issues and the need to understand the issues better and create paths for action.

Emma emphasized the importance of IR in “surfacing things that are worthy of our time and our attention in terms of us doing our work...when you're bringing something like that, and we have time to really go into...strategizing about who, how, why, what, and that we feel empowered to use the different structures...if we want to be really using data to drive change.”

Frankie shared thoughts about how the data could inform budgetary decisions, “data driven decision making is very important...as far as the budget is concerned, I think it's important that we look at the data and see where those resources would be best used...[it] is definitely something that we should expand as we continue on.” Specifically, Frankie talked about the need to allocate more funds for student supports “just seeing that those areas are in need of more resources. So trying to find opportunities to get those folks more money to serve those students and do what we can to help them be successful.” Additionally, from an instructor perspective, Frankie talked about trying “to be a little more compassionate towards our students...being more open to hearing from them and continue reaching out to them and trying to figure out how we can help them be successful.” Amanda highlighted how the data briefs “reinforce[d] where we need to do a better job”.

Speaking about outcome gaps for Hispanic and Native American students, Sofia expressed, “the degree that they're impacting a specific population...because that's such a small population and has such a big impact and it's so critical that we're supporting in that area”. Dani talked about how “equity can only come through understanding” and added, referring to the CSDBs, that “if we really want to use this as a tool to make changes, we need to put some time resource into it.”

The data briefs can spark curiosity and motivation to learn more and identify actions. Lola described, “it's definitely gotten a certain set of wheels turning specifically

around student success because we've had opportunities to engage in different types of conversation around that,” and added, “it's basically empowered me to be in a position to say, oh yeah, I've heard about that, and I know where to go for more information.”

The importance of the data briefs is underscored because participants were candid about not always reading the IR Notes or reviewing the information provided by IR, saying, “There's a bit high likelihood people aren't looking at it and reading it.” In May 2023, IR published the “IR Note No. 6 Pace of Academic Progress,” and the interviews were conducted in the second half of July. At the time of the interviews, six of seven participants had not read the IR Note (it is approximately a 5-minute read).

All participants expressed how the CSDBs had been valuable in increasing their understanding, and some could make actionable connections to their jobs or departments. The CSDBs also clearly ensure that some minimum of crucial information is actively received by administrators. All participants voiced support for CSDBs to become an ongoing practice for the team and offered ideas to make improvements, deepen the analyses, continue the dialogue started through the CSDBs, and add structures that focused on developing action plans. Therefore, the empirical evidence produced during this case study strongly supports this proposition.

Summary

In this chapter, I comprehensively described the analysis processes for the two analysis phases of this study. First, I explained how the phenomenological approach facilitated the examination of the embedded case study units (the participants). This allowed me to understand how administrators at my institution experience the data sensemaking process and their professional responsibility toward equitable student outcomes. Participants describe the difference between engaging with data independently and doing so as a team through active discussion. They expressed how the

opportunity to ask questions and receive explanations and context expands their meaning-making processes. More importantly, they highlighted the importance of listening and considering diverse personal and professional perspectives in advancing their understanding of the topic and their ability to work better as a team. Additionally, although participating in collective reflection brought up paradoxical experiences, participants agreed on the value of reflecting as a team to support connection and understanding among team members and to support their data sensemaking.

Second, I explained the thematic analysis process that helped me examine the case study propositions. Empirical data from this case study provides robust evidence that engaging in collective data sensemaking expands understanding by considering diverse perspectives, added context, and negotiated meaning. Additionally, scaffolding data sensemaking and integrating reflection advances student equity understanding among senior administrators and reinvigorates their commitment to focus and act to close equity gaps.

Overall, the findings from this inquiry support the assertion that IR can be positively leveraged to advance data sensemaking and student equity understanding.

CHAPTER 5

DISCUSSION & IMPLICATIONS

This inquiry was designed to glean insights into the data sensemaking process among community college administrators at my institution. Specifically, I sought to: 1) describe their experiences engaging in group discussion and personal reflection to make sense of data and 2) describe their professional responsibility in achieving equitable student outcomes. Below, I relate the findings detailed in the previous chapter to the theoretical frameworks used to conceptualize this investigation. Additionally, I summarize the boundaries of this study, share the lessons I learned, and discuss implications for practice and future research.

Theoretical Connections

The sensemaking properties and other dimensions identified in critical sensemaking provided an insightful framework for analyzing and interpreting this study's findings.

Weick (1995) identified seven properties of sensemaking. He identified the first, identity construction, as an essential property in sensemaking. Furthermore, Helms Mills et al. (2010) explained that identity also influences “how individuals understand the other six properties (p. 188).” This was manifested in the CSDB discussions and interview responses. Participants talked about how their professional role or personal experience impacted their meaning-making and response to the data analyses or their understanding of their professional responsibility toward equitable student outcomes. For example, one participant shared how, for her, it was “hard sometimes” because some of the data analyses “fall under my umbrella.” Identifying as the division’s leader created a more emotional or defensive response from her. For others, their personal identities

created a connection to the information they were receiving: “I was one of those students.”

Participants formed narratives and opinions about the CSDB sessions after experiencing them and reflecting on that experience, aligned with the retrospective property identified by Weick. Despite having particular attitudes about reflection, different responses to the opportunity cost of their time, and approaching the sessions from different perspectives, participants found them “engaging,” “valuable,” and “important” when reflecting and assigning meaning to their experiences participating in the CSDBs. Nardon and Hari (2022) explained how individuals can experience this “as a flow,” adding meaning to it afterward (p. 19). Some participants also engage retrospectively with other aspects of the innovation. For example, one participant explained her apprehension and anxiety about writing the photovoice reflections. Still, after completing the activity, she experienced a “Wow, that felt good” and interpreted it as an “almost therapeutic” event.

The third property, a reciprocal relationship between the individual and the environment, also impacts sensemaking (Weick, 1995). This was an important theme that arose in the phenomenological and thematic analyses. Several participants made references to “reading the room,” paying attention to others’ non-verbal cues, comparing their own experiences to the perceived experiences of others in real-time, and using that information to aid their sensemaking, or they explained how sometimes it became a distraction or barrier to their engagement.

The fourth property, social, was a central theme that emerged from the empirical evidence. The role of dialogue and the inclusion of diverse perspectives during the collective sensemaking occurring in the CSDBs was a critical factor in expanding understanding. All participants explained how the presence of others impacted their

meaning-making and expanded their understanding of the data presented. The social interactions span different aspects, such as asking questions, listening to others' questions, explanations, and perspectives, and relying on the presenter's scaffolding and storytelling of the data. Hence, the social property of sensemaking was one of the most critical in the process of ascribing meaning to data. Koesten et al. (2021) identified collaboration, context, summarization, and verbalizing activities as key activities in data-centric sensemaking among data professionals. These activities were also important features in this action research inquiry.

The fifth property, ongoing, was a feature of how participants connected information. Some participants described their meaning-making process as dynamic. Even within one CSDB, participants made connections and revised their understanding. For example, one participant described how returning to data presented in previous slides after drilling down gave her an "increased understanding of the previous ones and how they all are interrelated." The benefit from social interactions and dialogues when engaging in data sensemaking was that as participants contributed thoughts, explanations, or opinions, others incorporated that information to revise their understanding.

Participants illustrated how the sixth property, extracted cues, supported how they made connections to create meaning. Differences in extracted cues were not only about the various data points each participant paid attention to but also included extracted cues from the environment, body language from other colleagues, reaching out to others when seeking additional information (for example, maybe turning toward or looking at a colleague as a way to encourage them to participate).

As participants began interpreting the data presented, they quickly moved from an interest in accuracy (questions about understanding who was represented in the data,

how a metric was calculated, and so on) to plausibility, the seventh property of sensemaking (Weick, 1995). Administrators began voicing possible explanations about what was represented in the data from socioeconomic factors, systemic and institutional issues, and potential effects of the pandemic. Some sought to incorporate histories about practices within the institution or other information they had access to and remembered (knowledge of national trends, other literature, reports, etc.). They began to individually organize information in ways they thought conceivable, allowing them to continue their meaning-making process.

Although I was able to glimpse some of the critical sensemaking dimensions, the innovation was too brief to illuminate other important dimensions, such as power structures, the participants' use of language to negotiate meaning, or the impact of past relationships. Furthermore, other analytical approaches may be better suited to elucidate some of those factors. For example, discourse analysis may be a more appropriate choice to examine the administrators' use of language, or network and content analysis may be useful options to understand power structures. These factors affect the sensemaking process (Helms Mills et al., 2010), but this inquiry could have benefited from a longer implementation to be able to make those connections.

In contrast, findings from this study support McNair et al.'s (2020) understanding that reflection and discussion are indispensable to fostering an equity-minded approach to data and that "simply consulting or examining data is insufficient" (p. 54). Participants shared how it was only through dialogue, reflection, and collective data sensemaking that their understanding of equity gaps and the magnitude of those gaps became clearer and more nuanced. Some acknowledged their limited understanding when they only engaged in individual data sensemaking. Others admitted to the lower likelihood that they review the data when delivered via passive methods

(email, written briefs, etc.). Administrators also recognized the need for the briefs to become an ongoing practice and to not approach equity issues as a special initiative or project. However, examining one's own role and actions is essential to advancing equity-mindedness into action (McNair et al., 2020) and promoting learning among leaders (Argyris, 1991). Argyris (1991) emphasizes the need for leaders to “reflect critically on their own behavior, identify the ways they often inadvertently contribute to the organization's problems, and then change how they act” (p.2). Although the CSDBs were effective in raising understanding, consciousness, and awareness, additional reflective time and facilitation will be required for leaders to think directly about how their actions and roles may be contributing to student outcome inequities.

Moreover, this inquiry supports the notion that IR is uniquely positioned to be leveraged to engage leaders in a discussion on existing student inequities and to advocate for advancing institutional equity goals (Carmona et al., 2018; Felix et al., 2021). Similarly, it supports Dellinger's (2019) understanding that “institutional data alone do not answer the questions that institutions are asking about student outcomes, equity, and achievement” (p. 11) and that IR needs “to provide data in a way that tells a story” (p. 138).

Boundaries of the Study

As with any inquiry, this study is bounded by its design and factors that affected it during implementation. Due to its design as an action research project and focus on phenomenological questions, this study is bounded by its context. This inquiry aimed not to establish generalizable knowledge but to advance my understanding of how my colleagues make meaning of data so that I can improve my practice and help support the goals of my team and the institution to advance student outcomes and eliminate equity gaps.

Additionally, other factors during implementation also meant adjusting the intended design. For example, I intended to fully integrate the photovoice-related data into the phenomenological analysis. However, I made modifications because the written reflections did not yield the expected results (i.e., relevant textual data). I relied more on other data sources (recordings of the discussions, observations, and reflections) to answer the second research question. Furthermore, there were differences in how the team members' voices were represented in the study and analysis. Because the photovoice exercise had to be analyzed in parallel, I relied on the discussion recordings more heavily than intended. It also meant that not all participants shared their experiences with the group.

Moreover, some participants had more comprehensive responses than others. This was also a feature in the interviews. Some participants were succinct with their answers, which resulted in meaningful differences in interview durations (25 to 59 minutes). This was mitigated in part by important features of the phenomenological approach in which the aim is to provide a rich and comprehensive portrayal of the experience and not to focus on the prevalence of occurrence. But, it is still a consideration affecting the study.

Another factor impacting this inquiry is that the institution's IR function is recent. Being the first full-time institutional researcher, while many of my colleagues have long tenures at the college, means they do not have experience interacting with other IR departments or personnel. They have few or no points of comparison. Although a couple of participants had professional experiences that allowed them to contrast to IRs in other institutions, most participants did not. Therefore, it was challenging for them to separate the benefits specific to the data briefs from the inherent impact and

progress of having a full-time dedicated IR resource at the institution over the last three years.

Nevertheless, this study provides useful insights to continue to improve my practice. Additionally, I have provided detailed accounts of the inquiry design, implementation, and findings. Hence, readers with similar interests are able to evaluate features that may be useful to them or can be extrapolated to their contexts.

Lessons Learned

Conducting this study was a journey filled with personal learning. This inquiry was my first serious attempt at conducting qualitative research. Having a background in economics and quantitative methods and being in a profession deeply rooted in positivist epistemology meant I had to spend significant time learning about a variety of qualitative methodologies and methods. I had to become more tolerant of the idea that, as a novice researcher in this area, I was making inquiry choices with my newly acquired understanding of qualitative methods, where I was not feeling as confident as I am used to. I had to learn to think differently, learn how to reflect, and become comfortable with reflection. I had to learn to lean into the gray and become comfortable with fluidity and the undefined.

This journey also included unlearning. Learning to write is a lifelong project, but in this instance, I had to unlearn writing about research in the third person and learn and understand that in action research, the role of the researcher is essential and explicit, and that includes communicating directly with the reader and using the first person.

The innovation in this study also required developing skills as an effective facilitator. The sessions were successful, but this is an area where I need to continue to learn, grow, and practice. Institutional research has always required good collaboration

and teamwork skills. However, I believe that to effectively become a change agent, institutional researchers also need strong facilitator skills, which are clearly different from good presentation skills. As change agents, researchers need to become comfortable having and leading difficult conversations, becoming advocates to highlight areas needing leaders' attention, and sharing their understanding and informed opinions based on their research and data. My journey as a facilitator is in the early stages, with much to learn and practice over the next few years.

Implications for Practice

Integrating equity-mindedness into quantitative data analysis and data dissemination requires intention and focus. The first steps include disaggregating data, rejecting euphemisms, and using clear labels and language (McNair et al., 2020; Fink & Jenkins, 2020). However, even these seemingly easy steps can be a challenge for IR professionals in small colleges. Managing varied and wide-ranging demands with only one staff member impacts the researcher's ability to devote sufficient and quality time to analysis. Although UNM-Taos is fortunate to have a full-time position for IR, that is not the case in two of the UNM branches.

Furthermore, at small colleges with IR departments with only one staff member, the campus community easily conflates the function with the person. This is not unique. However, it does color individuals' perceptions of the department. This can have positive or negative implications depending on how the individual and the IR function are perceived by her colleagues. Consequently, it becomes even more imperative for IR to be intentional and deliberate and form productive partnerships and collaborations across the campus community.

Additionally, when the populations are very small, it becomes very challenging to disaggregate to focus on local degree-seeking students (e.g., N=351 in F23) and try to

compare academic outcomes or focus analysis by programs. The variability and nature of very small numbers make identifying patterns much harder. Over and above that, an important analytical step towards equity-mindedness is integrating intersectionality, which again requires subsetting the data and drilling down but becomes a limited exercise when you have few observations. This has important implications for practice because even though I must continue those efforts, it becomes more critical that I match the analytical tools to our context and learn and rely more on other lenses, such as integrating robust qualitative and mixed methods into the practice.

Although the results from the innovation were positive and very promising, the innovation was brief and intense. The challenge remains to continue to adjust and test variations of the CSDB structure to identify a sustainable practice. Participants' preferences for the data briefs were conflicting, with some wishing for longer and repeated sessions and others voicing concerns about the opportunity cost of their time. Although I posited the 30-minute sessions as a satisfactory compromise, that is still a debated feature. Additionally, because the briefs were highly effective at generating interest and conversation, several briefs ran measurably longer, adding support for the need to allocate more time, which would be challenging. Becoming more comfortable with data sensemaking requires exercising those skills regularly. However, moving from awareness, understanding, and motivation to act to develop and implement solutions and evaluating the effectiveness of those efforts requires much longer timeframes. Hence, finding the balance between data dissemination periods and allowing time to develop and implement action plans is still an area of tension and exploration. Nevertheless, embedding the data briefs into an existing structure was an effective strategy.

Another area requiring attention is the need to integrate efficient structures to move from learning, awareness, and discussion to action planning. Several participants shared that they would like to see adjustments to the data briefs, including adding sessions specific to brainstorming and planning based on the data. They also clearly implied that they meant for IR to play a role in helping develop those organizational structures as part of the data briefs. This is a coherent extension of envisioning IR as a change agent, but it also means that IR needs to develop a strong capacity for leading change initiatives.

Future action research cycles should include developing solid qualitative and mixed methods capacity in IR operations, testing variations to the current CSDB structure, such as testing different durations and recurrence periods, and adding sessions specific to action planning.

Implications for Research

A challenging aspect of this inquiry was the scant literature on and for IR. No dedicated journals in the U.S. are concerned with understanding how to develop an effective IR function or its implications. Professional publications such as the AIR Profile publish a handful of pieces a year primarily addressing advanced quantitative analytical techniques. Moreover, they tend to be developed by and for large institutions with much larger IR resources and a focus on advanced analytics of large datasets.

Although that is clearly important, it excludes the many colleges with small populations and/or minimal IR resources that do not have the necessary datasets, personnel, or systems to engage in sophisticated analytics. The Carnegie Classification of Institutions of Higher Education defines classifications of institutions by size and setting. According to the Integrated Postsecondary Education Data System (IPEDS) Institutional Characteristics, over 6,200 institutions were identified in 2022. Over 38% of all higher

education institutions are categorized as very small or small, with less than 3,000 students. Consequently, a large number of institutions are effectively left out of the conversation about IR needs and practice. Furthermore, research is needed beyond practicing analytical techniques. It is important to understand and have systemic inquiry about the function itself and about ways to incorporate other epistemologies and expand the methods and methodologies used in day-to-day operations.

Over the past few years, the Association for Institutional Research has surveyed institutions and professionals to determine staffing levels and scope of institutional research offices. However, research is needed to determine what may constitute a sufficient or desirable size for IR, depending on the institution's size. What are the consequences and costs of highly constrained IR resources? What is the share of institutions that have insufficient IR resources? This could help institutions make decisions about making feasible but adequate investments in their IR function and the potential benefits for their institutions from those investments. To grow the IR function into a change agent role, institutional researchers need the ability to engage in deeper analysis and more meaningful collaborations, information dissemination, and leveraging active data sensemaking approaches to scaffold understanding among leaders and others. All of these actions require significant investments of staff time and resources.

Due to a variety of reasons, as explained earlier in the manuscript, IR is typically perceived or conceptualized as a technical or administrative function, not a research function. Being consumed by reporting or fulfilling discrete data requests means forgoing efforts to define and pursue an institutional research agenda addressing the critical questions the institution needs to answer. It also means limited efforts to pursue other methodological approaches (e.g., qualitative, mixed methods) that may be better aligned with the research questions or institutional context because of the time

requirements for capacity building, data collection and analysis, and the required turnaround of results. However, bringing an equity-mindedness approach to IR requires we integrate rich context into our analyses and that we incorporate student and student service professionals' voices in our analyses and understanding. Moreover, an essential feature of the equity-minded approach is adding reflection and dialogue to enrich the meaning-making process of data. This requires researchers to develop a strong skill set as facilitators and overcome the hesitation to take a leadership role. These are all areas that could benefit from additional research.

This inquiry was able to identify minimal research specific to data sensemaking. Although this study identified the positive and promising potential of engaging leaders in ongoing collective data sensemaking and reflection, the inherent boundaries of the inquiry mean further research is needed to investigate whether these results are applicable to other contexts. Additionally, more research is needed to understand how higher education leaders engage in data sensemaking and the impact of developing and growing a reflection practice among decision-makers.

Closing

In this study, I sought to better understand the ways in which senior leaders at UNM-Taos engage in data sensemaking. Particularly, I posited that collective data sensemaking that allocated time for discussion and reflection would result in more robust understanding among administrators. I proposed that institutional research could be leveraged to lead this process with the aim of expanding the understanding of inequitable student outcomes. To guide this action research project, I used Weick's theory of sensemaking and the constructs of QuantCrit and data equity to inform the development of the innovation, the Critical Sensemaking Data Briefs, and the analytical process.

The findings of this inquiry support the assertion that collective data sensemaking and reflection help senior leaders expand their understanding of data and enrich their meaning-making process. Participants described the difference between engaging with data independently versus through active discussion with their colleagues. They expressed how the opportunity to ask questions and receive explanations and context expands their data sensemaking. More importantly, they highlighted the importance of listening and considering diverse personal and professional perspectives in advancing their understanding of the topic and their ability to work better as a team. Additionally, although participating in collective reflection brought up paradoxical experiences, participants agreed on the value of reflecting as a team to support connection and understanding among team members and to support their data sensemaking.

This case study provides robust evidence that engaging in collective data sensemaking expands understanding by considering diverse perspectives, added context, and negotiated meaning. Additionally, this action research illustrates how IR can lead the scaffolding of data sensemaking by providing guidance, context, a structure for dialogue, and the integration of reflection. Through this process, senior leaders advanced their understanding of student outcome inequities at UNM-Taos, and it reinvigorated their commitment to focus and take action to close equity gaps.

Overall, the findings from this inquiry support the assertion that IR can be positively leveraged to advance data sensemaking and student equity understanding.

REFERENCES

- A brief history of MSIs. (2014). Rutgers Graduate School of Education Center for Minority Serving Institutions. <https://cmsi.gse.rutgers.edu/content/brief-history-msis>*
- Association of American Colleges and Universities. (2018). *A vision for equity: Results from AAC&U's project, committing to equity and inclusive excellence: Campus-based strategies for student success. <https://www.aacu.org/publication/a-vision-for-equity>*
- Almeida, D. J. (2016). Low-income Latino students and California's early assessment program: The role of sensemaking in the use of college readiness information. *Journal of Hispanic Higher Education, 15*(4), 310–339. <https://doi.org/10.1177/1538192715612549>
- Annamma, S. A., Ferri, B. A., & Connor, D. J. (2018). Disability critical race theory: Exploring the intersectional lineage, emergence, and potential futures of DisCrit in education. *Review of Research in Education, 42*, 46–71. <http://www.jstor.org/stable/44668713>
- Ancona, D. (2012). Sensemaking: Framing and acting in the unknown. In S. A. Snook, N. Nohria, & R. Khurana, *The handbook for teaching leadership: Knowing, doing and being*. Thousand Oaks: SAGE Publications. https://www.sagepub.com/sites/default/files/upm-binaries/42924_1.pdf
- Anderson, J. (2013, November 22). *Remembering professor Chris Argyris*. Harvard Graduate School of Education. <https://www.gse.harvard.edu/ideas/news/13/11/remembering-professor-chris-argyris>
- Annan, K. (n.d.). *Education for all: What it takes to get there* [White paper]. McGraw Hill.
- Argyris, C., Putnam, R., & Smith, D. M. L. (1985). *Action science: concepts, methods, and skills for research and intervention* (1st ed.). Jossey-Bass.
- Argyris, C. (1982). The executive mind and double-loop learning. *Organizational Dynamics, 11*(2), 5–22.
- Argyris, C. (1991, May 1). Teaching smart people how to learn. *Harvard Business Review. <https://hbr.org/1991/05/teaching-smart-people-how-to-learn>*
- Barone, T. & Eisner, E. W. (2011). What is and what is not arts based research? In *Arts based research*. Sage Publications, Inc.
- Bernal, D. D. (2002). Critical race theory, Latino critical theory, and critical raced-gendered epistemologies: Recognizing students of color as holders and creators

- of knowledge. *Qualitative Inquiry*, 8(1), 105–126.
<https://doi.org/10.1177/107780040200800107>
- Bhattacharya, K. (2017). *Fundamentals of qualitative research: A practical guide*. Routledge.
- Bien, C., & Sassen, R. (2020). Sensemaking of a sustainability transition by higher education institution leaders. *Journal of Cleaner Production*, 256, 120299.
<https://doi.org/10.1016/j.jclepro.2020.120299>
- Burr, V. (2003). *Social constructionism*. London: Routledge.
- CampbellJones, B., Keeny, S., & CampbellJones, F. (2021). *Culture, class, and race: Constructive conversations that unite and energize your school and community*. ACSD Books.
- Carmona, J., Sansone, V. A., Gonzales, L. D., & Núñez, A.-M. (2018). Promotoras y políticas in the university. In C. Rodriguez, M. A. Martinez, & F. Valle (Eds.), *Latino educational leadership: Serving Latino communities and preparing Latinx leaders across the P-20 pipeline* (pp. 135–158). Information Age Publishing, Inc.
- Center for Social Solutions, University of Michigan. (2021, March 8). *Diversity in Higher Education Series, part I*. <https://lsa.umich.edu/social-solutions/news-events/news/inside-the-center/insights-and-solutions/infographics/ali-series-part-i---the-history-of-diversity-in-higher-education.html>
- Center for Social Solutions, University of Michigan. (2022, January 26). *Diversity in Higher Education Series, part II*. <https://lsa.umich.edu/social-solutions/news-events/news/inside-the-center/insights-and-solutions/infographics/diversity-in-higher-education-series---part-ii.html>
- Chadwick, S. A., & Pawlowski, D. R. (2007). Assessing institutional support for service-learning: A case study of organizational sensemaking. *Michigan Journal of Community Service Learning*, 13(2), 31–39.
- Coburn, C. E., & Turner, E. O. (2011). Research on data use: A framework and analysis. *Measurement*, 9(4), 173–206. <https://doi.org/10.1080/15366367.2011.626729>
- College Navigator (n.d.). *University of New Mexico-Main Campus*. National Center for Education Statistics. Retrieved February 12, 2022, from <https://nces.ed.gov/collegenavigator/?q=university+of+new+mexico&s=all&id=187985#general>
- College Navigator (n.d.). *University of New Mexico-Taos Campus*. National Center for Education Statistics. Retrieved February 12, 2022, from <https://nces.ed.gov/collegenavigator/?q=university+of+new+mexico-taos&s=all&id=188225>

- Covarrubias, A. (2011). Quantitative intersectionality: A critical race analysis of the Chicana/o educational pipeline. *Journal of Latinos and Education*, 10(2), 86–105. <https://doi.org/10.1080/15348431.2011.556519>
- Covarrubias, A., Nava, P. E., Lara, A., Burciaga, R., Vélez, V. N., & Solorzano, D. G. (2018). Critical race quantitative intersections: A *testimonio* analysis. *Race, Ethnicity and Education*, 21(2), 253–273. <https://doi.org/10.1080/13613324.2017.1377412>
- Covarrubias, A. & Vélez, V. (2013). In M. Lynn & A.D. Dixon (Eds.), *Critical race quantitative intersectionality: An anti-racist research paradigm that refuses to “let the numbers speak for themselves. Handbook of critical race theory in education* (pp. 290–306). Routledge. <https://doi.org/10.4324/9780203155721-30>
- Cox, Reason, R. D., Tobolowsky, B. F., Brower, R. L., Patterson, S., Luczyk, S., & Roberts, K. (2017). Lip service or actionable insights? Linking student experiences to institutional assessment and data-driven decision making in higher education. *The Journal of Higher Education* (Columbus), 88(6), 835–862. <https://doi.org/10.1080/00221546.2016.1272320>
- Crawford, C. E. (2019). The one-in-ten: Quantitative critical race theory and the education of the ‘new (white) oppressed.’ *Journal of Education Policy*, 34(3), 423–444. <https://doi.org/10.1080/02680939.2018.1531314>
- Crawford, C. E., Demack, S., Gillborn, D., & Warmington, P. (2018). Using numbers for social justice (Or, How Not to be Lied to with Statistics). In J. T. DeCuir-Gunby, T. K. Chapman, & P. A. Schutz (Eds.), *Understanding critical race research methods and methodologies: Lessons from the field* (First, pp. 125–137). Routledge. <http://ebookcentral.proquest.com/lib/asulib-ebooks/detail.action?docID=5611521>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications, Inc.
- Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (6th ed.). Pearson.
- Cridland-Hughes, S., Brittain, M., & Che, S. M. (2019). Using photovoice to resist colonial research paradigms. In K. K. Strunk & L. A. Locke (Eds.), *Research methods for social justice and equity in education*. Springer International Publishing AG. <http://ebookcentral.proquest.com/lib/asulib-ebooks/detail.action?docID=5927059>
- Curley, K. (2019). An Invitation to a third space for higher education quantitative researchers. In E. M. Zamani-Gallaher, D. D. Choudhuri, & J. L. Taylor (Eds.), *Rethinking LGBTQIA students and collegiate contexts: Identity, policies, and campus climate* (1st ed., p. 17). Taylor & Francis Group.

- Danner, M.J.E., Pickering, J. W., & Paredes, T. M. (2018). *Using focus groups to listen, learn, and lead in higher education* (First edition.). Stylus.
- Degn, L. (2015a). Identity constructions and sensemaking in higher education – a case study of Danish higher education department heads. *Studies in Higher Education*, 40(7), 1179–1193. <https://doi.org/10.1080/03075079.2014.881345>
- Degn, L. (2015b). Sensemaking, sensegiving and strategic management in Danish higher education. *Higher Education*, 69(6), 901–913. <https://doi.org/10.1007/s10734-014-9812-3>
- Dellinger, A. M. (2019). *Making sense of data: An examination of the sensemaking process in a community college data inquiry group* [Ph.D., University of California, Los Angeles]. <http://www.proquest.com/docview/2331975395/abstract/49CFD34E8A904BF2PQ/1>
- Dibley, L., Dickerson, S., Duffy, M., & Vandermause, R. (2020). *Doing hermeneutic phenomenological research: A practical guide*. SAGE Publications Ltd. <https://doi.org/10.4135/9781529799583>
- Dick, B. (2014). Action research. In *Qualitative methodology* (pp. 50-66). SAGE Publications, Inc., <https://dx.doi.org/10.4135/9781473920163.n4>
- Dowd, A. D., Malcom, L., Nakamoto, J., & Bensimon, E. M. (2012). Institutional researchers as teachers and equity advocates: Facilitating organizational learning and change. In E. M. Bensimon & L. Malcom, *Confronting equity issues on campus: Implementing the Equity Scorecard in theory and practice*. Stylus Publishing, LLC.
- Dragoo, K. E., & Cole, J. P. (2019). *Laws affecting students with disabilities: Preschool through postsecondary education* (R45595; p. 32). Congressional Research Service. <https://crsreports.congress.gov/product/pdf/R/R45595>
- Drury, R. (2003). Community colleges in America: A historical perspective. *Inquiry*, 8(1).
- Du Bois, W. (1899). *Philadelphia Negro: Social study*. Philadelphia, Printed for the University.
- Eatough, V., & Smith, J. A. (2017). Interpretative phenomenological analysis. In C. Willig & W. S. Rogers (Eds.), *The SAGE Handbook of Qualitative Research in Psychology* (pp. 193–209). SAGE Publications Ltd. <https://doi.org/10.4135/9781526405555.n12>
- Edmondson, A. C. (2015). Chris Argyris (1923–2013). *American Psychologist*, 70(5), 473. <https://doi.org/10.1037/a0039188>

- Emme, M. J. (2008). Photonovella and Photovoice. In *The SAGE encyclopedia of qualitative research methods*. SAGE Publications, Inc.
<https://doi.org/10.4135/9781412963909>
- Espinosa, L., Chessman, H., & Wayt, L. (2016, March 8). Racial climate on campus: A survey of college presidents. *Higher Education Today*.
<https://www.higheredtoday.org/2016/03/08/racial-climate-on-campus-a-survey-of-college-presidents/>
- iExcelencia in Education! (2023). *Latino college completion: United States*.
<https://www.edexcelencia.org/research/latino-college-completion>
- iExcelencia in Education! (2023). *Latino College Completion: New Mexico*.
<https://www.edexcelencia.org/research/latino-college-completion/new-mexico>
- Felix, E. R., Ceballos, D. A., Salazar, R., Vedar, E. N. R., & Perez, E. J. (2021). Examining the field of institutional research: Toward more equitable practices. *New Directions for Institutional Research*, 2021(189–192), 9–28.
<https://doi.org/10.1002/ir.20349>
- Fink, J. & Jenkins, D. (2020). Unpacking program enrollments and completions with equity in mind. Community College Research Center at Teachers College, Columbia University. <https://ccrc.tc.columbia.edu/publications/unpacking-program-enrollments-completion-equity.html>
- Fountain, J. H. (2023). *The higher education act (HEA): A primer* (Report No. R43351). Congressional Research Service. <https://sgp.fas.org/crs/misc/R43351.pdf>
- Franco, M. A., & Hernández, S. (2018). Assessing the capacity of Hispanic serving institutions to serve Latinx students: Moving beyond compositional diversity. *New Directions for Institutional Research*, 2018(177), 57–71.
<https://doi.org/10.1002/ir.20256>
- Gagliardi, J. S. & Wellman, J. (2015, February). *Meeting demands for improvements in public system institutional research*. National Association of System Heads. Retrieved February 1, 2022 from <http://nashonline.org/wp-content/uploads/2017/08/Assessing-and-Improving-the-IR-Function-in-Public-University-Systems.pdf>
- Garcia, G. A. (2019). *Becoming Hispanic-serving institutions opportunities for colleges and universities*. Johns Hopkins University Press.
- Garcia, G. A. (2023). *Transforming Hispanic-serving institutions for equity and justice*. Johns Hopkins University Press.
- Garcia, N., López, N., & Vélez, V. (2018). QuantCrit: rectifying quantitative methods through critical race theory. *Race Ethnicity and Education*, 21(2), 149–157. DOI: 10.1080/13613324.2017.1377675

- Gemignani, Z., Gemignani, C., Galentino, R., & Schuermann, P. (2014). *Data fluency empowering your organization with effective data communication* (2nd ed.). Wiley.
- Gergen, K. J. (1985). The social constructionist movement in modern psychology. *American Psychologist*, *40*(3), 266-275. <https://doi.org/10.1037/0003-066X.40.3.266>
- Gergen, K. J. (2015). *An invitation to social construction* (3rd ed.). SAGE Publications Ltd.
- Gillborn, D. (2005). Education policy as an act of white supremacy: Whiteness, critical race theory and education reform. *Journal of Education Policy*, *20*(4), 485–505. <https://doi.org/10.1080/02680930500132346>
- Gillborn, D. (2008). *Racism and education: coincidence or conspiracy?* Routledge.
- Gillborn, D., Warmington, P., & Demack, S. (2018). Quantcrit: Education, policy, 'big data' and principles for a critical race theory of statistics. *Race Ethnicity and Education*, *21*(2), 158–179. <https://doi.org/10.1080/13613324.2017.1377417>
- Gioia, D. A., & Chittipeddi, K. (1991). Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal*, *12*(6), 433.
- Given, L. (2008). Critical action research. In *The SAGE encyclopedia of qualitative research methods*. SAGE Publications, Inc. <https://dx.doi.org/10.4135/9781412963909.n78>
- Graber, A. A. (2022). *The Americans with disabilities act: A brief overview*. Congressional Research Service. <https://crsreports.congress.gov/product/pdf/IF/IF12227>
- Hathaway, R. S. (1995). Assumptions underlying quantitative and qualitative research: Implications for institutional research. *Research in Higher Education*, *36*(5), 535–562. <https://doi.org/10.1007/BF02208830>
- Heelan, C. M., & Mellow, G. O. (2017). Social justice and the community college mission: Social justice and the community college mission. *New Directions for Community Colleges*, *2017*(180), 19–25. <https://doi.org/10.1002/cc.20277>
- Helms Mills, J. (2010). Sensemaking. In *Encyclopedia of case study research* (Vol. 1, pp. 853-855). SAGE Publications, Inc., <https://dx.doi.org/10.4135/9781412957397.n313>
- Helms Mills, J., Thurlow, A., & Mills, A. J. (2010). Making sense of sensemaking: The critical sensemaking approach. *Qualitative Research in Organizations and Management*, *5*(2), 182–195. <http://dx.doi.org.ezproxy1.lib.asu.edu/10.1108/17465641011068857>

- Hernández, I., Berumen, J. G., & Zerquera, D. (2018). Conclusion and summary: Lessons for the future. *New Directions for Institutional Research*, 2018(177), 141–144. <https://doi.org/10.1002/ir.20262>
- Herr, K. & Anderson, G. L. (2005). Action research traditions and knowledge interests. In *The action research dissertation: A guide for students and faculty* (pp. 8-28). SAGE Publications, Inc., <https://dx.doi.org/10.4135/9781452226644>
- Hershberg, R. M. (2014). Constructivism. In D. Coghlan & M. Brydon-Miller (Eds.), *The SAGE encyclopedia of action research*. SAGE Publications Ltd. <https://doi.org/10.4135/9781446294406>
- Hill Collins, P., & Bilge, S. (2016). *Intersectionality*. Polity Press. <http://ebookcentral.proquest.com/lib/asulib-ebooks/detail.action?docID=4698012>
- Hirald, P. (2010). The role of critical race theory in higher education. *The Vermont Connection*, 31(1), 53–59.
- IR Professionals as Change Agents*. (2022). The Association for Institutional Research. Retrieved August 28, 2022, from <https://www.airweb.org/article/2022/08/04/ir-professionals-as-change-agents>
- Ivankova, N. V. (2015). *Mixed methods applications in action research: From methods to community action*. Thousand Oaks, California: SAGE.
- Jang, S. T. (2018). The implications of intersectionality on southeast Asian female students' educational outcomes in the United States: A critical quantitative intersectionality analysis. *American Educational Research Journal*, 55(6), 1268–1306. <https://doi.org/10.3102/0002831218777225>
- Jaschik, S., & Lederman, D. (Eds.). (2022). *2022 Survey of college and university presidents*. Inside Higher Ed & Hanover Research. <https://www.insidehighered.com/events/2022-survey-college-and-university-presidents>
- Johnson, M. A. (18 C.E.). *The transitional generation: Faculty sensemaking of higher education reform in Ecuador* [Doctoral dissertation, The College of William and Mary]. <https://www.proquest.com/docview/2047578408/abstract/5DC66BBB0796408FPQ/1>
- Kelly, H. A. & Keller, C. M. (2020). *Responsive & relevant, 2020-2021 annual report*. Association for Institutional Research. Retrieved February 1, 2022, from https://www.airweb.org/docs/default-source/documents-for-pages/governance/annual-reports/2020-2021_air-annual-report.pdf

- Kezar, A. (2013). Understanding sensemaking/sensegiving in transformational change processes from the bottom up. *Higher Education*, 65(6), 761–780. <https://doi.org/10.1007/s10734-012-9575-7>
- Kirwan, W. E. (2016, February 17). Inclusivity, history, and navigating the way forward. *Higher Education Today*. <https://www.higheredtoday.org/2016/02/17/student-life-in-the-balance-inclusivity-history-and-navigating-the-way-forward/>
- Koesten, L., Gregory, K., Groth, P., & Simperl, E. (2021). Talking datasets – Understanding data sensemaking behaviours. *International Journal of Human-Computer Studies*, 146, 102562. <https://doi.org/10.1016/j.ijhcs.2020.102562>
- Ladson-Billings, G. (1998). Just what is critical race theory and what's it doing in a nice field like education? *International Journal of Qualitative Studies in Education*, 11(1), 7–24. <https://doi.org/10.1080/714858243>
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in U.S. schools. *Educational Researcher*, 35(7), 3–12. <https://doi.org/10.3102/0013189X035007003>
- Latino students in higher education*. (2022). Postsecondary National Policy Institute. https://pnpi.org/wp-content/uploads/2022/09/LatinoStudentsFactSheet_September_2022.pdf
- Latz, A. (2012a). Toward a new conceptualization of photovoice: Blending the photographic as method and self-reflection. *Journal of Visual Literacy*, 31(2), 49–70. <https://www.tandfonline.com.ezproxy1.lib.asu.edu/doi/abs/10.1080/23796529.2012.11674700?needAccess=true>
- Latz, A. (2012b). Understanding the educational lives of community college students: A photovoice project, a Bourdieusian interpretation, and habitus dissonance spark theory. *Current Issues in Education*, 15(2), 1–21.
- Latz, A. (2017). *Photovoice research in education and beyond: A practical guide from theory to exhibition* (1st ed.). Routledge.
- Levine, A. (2021, June 13). The coming transformation of higher education: A scorecard. *Inside Higher Ed*. <https://www.insidehighered.com/views/2021/06/14/seven-steps-higher-ed-must-take-keep-pace-changes-our-society-opinion>
- López, N., Erwin, C., Binder, M., & Chavez, M. J. (2018). Making the invisible visible: Advancing quantitative methods in higher education using critical race theory and intersectionality. *Race Ethnicity and Education*, 21(2), 180–207. <https://doi.org/10.1080/13613324.2017.1375185>
- Maitlis, S., & Christianson, M. (2014). Sensemaking in organizations: Taking stock and moving forward. *Academy of Management Annals*, 8, 57–125. <https://doi.org/10.5465/19416520.2014.873177>

- McArthur, J. (2016). Assessment for social justice: The role of assessment in achieving social justice. *Assessment & Evaluation in Higher Education*, 41(7), 967–981. <https://doi.org/10.1080/02602938.2015.1053429>
- McNair, Bensimon, E. M., & Malcom-Piqueux, L. E. (2020). *From equity talk to equity walk: Expanding practitioner knowledge for racial justice in higher education*. Jossey-Bass.
- McPherson, L.K. (2015). Righting historical injustice in higher education. In: H. Brighouse & M. McPherson (Eds.), *The aims of higher education: Problems of morality and justice*. University of Chicago Press.
- Mertler, C. (2017). *Action research: improving schools and empowering educators* (5th ed.). SAGE Publications, Inc.
- Mills, J. H. (2003). *Making sense of organizational change*. Routledge.
- Mills, A. J., Durepos, G., & Wiebe, E. (2010). Critical sensemaking. In *Encyclopedia of case study research* (Vol. 1, pp. 258-260). SAGE Publications, Inc., <https://dx.doi.org/10.4135/9781412957397.n96>
- Mitchell, T., & O'Brien, J. (2020). Diversity, equity, and inclusion (DEI) matters. *EducaseReview*, 2, 6–7.
- Mokher, C. G., Park-Gaghan, T. J., Spencer, H., Hu, X., & Hu, S. (2020). Institutional transformation reflected: Engagement in sensemaking and organizational learning in Florida's developmental education reform. *Innovative Higher Education*, 45(1), 81–97. <https://doi.org/10.1007/s10755-019-09487-5>
- Morris, A. (2015). *The scholar denied: W. E. B. Du Bois and the birth of modern sociology*. University of California Press.
- Moustakas, C. (1994). *Phenomenological research methods*. SAGE Publications, Inc. <https://doi.org/10.4135/9781412995658>
- Nardon, L., & Hari, A. (2022). The sensemaking perspective. In L. Nardon & A. Hari (Eds.), *Making sense of immigrant work integration: An organizing framework* (pp. 15–30). Springer International Publishing. https://doi.org/10.1007/978-3-031-13231-5_2
- National Center for Education Statistics. (2022). *Summary Tables* [Data set]. Integrated Postsecondary Education Data System. <https://nces.ed.gov/ipeds/summarytables>
- Noffke, S. (2009). Revisiting the professional, personal, and political dimensions of action research. In *The SAGE handbook of educational action research* (pp. 6-24). SAGE Publications Ltd, <https://dx.doi.org/10.4135/9780857021021>

- Núñez, A.-M. (2016, February 4). Breaking the cycle. *Higher Education Today*.
<https://www.higheredtoday.org/2016/02/04/breaking-the-cycle/>
- Office for Civil Rights. (2021). *Education in a pandemic: The disparate impacts of COVID-19 on America's students*. U.S. Department of Education.
<https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.pdf>
- O'Meara, K., Lounder, A., & Campbell, Corbin M. (2014). To heaven or hell: Sensemaking about why faculty leave. *The Journal of Higher Education*, 85(5), 603–632.
- Passerini, K. (2022, September 12). Change: The inevitable choice forward. *Educause Review*. <https://er.educause.edu/articles/2022/9/change-the-inevitable-choice-forward>
- Pérez Huber, L., Vélez, V. N., & Solórzano, D. (2018). More than 'papelitos': a QuantCrit counterstory to critique Latina/o degree value and occupational prestige. *Race Ethnicity and Education*, 21(2), 208–230.
<https://doi.org/10.1080/13613324.2017.1377416>
- Peters, E. (2021, August 21). *Following Up: IR in the middle*. Association of Institutional Research.
<https://www.airweb.org/resources/news/recentnews/2021/08/14/following-up-ir-in-the-middle>
- Plano Clark, V. L., & Creswell, J. W. (2015). *Understanding research: A consumer's guide* (2nd ed.). Pearson.
- Pollock, M. (2009). *Colormute: Race talk dilemmas in an American school*. Princeton, NJ: Princeton University Press.
- Pratt, M. G. (2000). The good, the bad, and the ambivalent: Managing identification among Amway distributors. *Administrative Science Quarterly*, 45, 456–493.
<https://doi.org/10.2307/2667106>
- Ramos, D., Camargo, E., Bennett, C., & Alvarez, A. (2021). Uncovering the effects of the sociopolitical context of the Nuevo South on Latinx college students' ethnic identification. *Journal of Diversity in Higher Education*.
<http://dx.doi.org/10.1037/dhe0000307>
- Rutgers Center for Minority Serving Institutions. (2014, April). *A brief history of MSIs*.
<https://cmsi.gse.rutgers.edu/content/brief-history-msis>
- Sablan, J. R. (2019). Can you really measure that? Combining critical race theory and quantitative methods. *American Educational Research Journal*, 56(1), 178–203.
<https://doi.org/10.3102/0002831218798325>

- Saldaña, J. (2021). *The coding manual for qualitative researchers* (4th ed.). SAGE Publications, Inc.
- Saupe, J. L. (1990). *The Functions of Institutional Research*. Association for Institutional Research, 1–17. Retrieved February 6, 2022, from <https://files.eric.ed.gov/fulltext/ED319327.pdf>
- Schudde, L., & Goldrick-Rab, S. (2015). On second chances and stratification: How sociologists think about community colleges. *Community College Review*, 43(1), 27–45. <https://doi.org/10.1177/0091552114553296>
- Schudde, L. (2018). Heterogeneous effects in education: The promise and challenge of incorporating intersectionality into quantitative methodological approaches. *Review of Research in Education*, 42(1), 72–92. <https://doi.org/10.3102/0091732X18759040>
- Senge, P. (1990). *The fifth discipline: the art and practice of the learning organization*. Doubleday/Currency.
- Shapiro, D. (2022). Student Enrollment in Pandemic Times: Recovery and Change [Slides]. https://myair.airweb.org/airssa/ecssashop.show_product_detail?p_product_serno=782&p_category_id=&p_mode=detail&p_cust_id=110336&p_session_serno=55750542&p_trans_ty=&p_order_serno=&p_promo_cd=&p_price_cd=
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63–75. <https://doi.org/10.3233/EFI-2004-22201>
- Solórzano, D. G., & Yosso, T. J. (2002). Critical race methodology: Counter-storytelling as an analytical framework for education research. *Qualitative Inquiry*, 8(1), 23–44. <https://doi.org/10.1177/107780040200800103>
- Steinberg, K. T. (2018). *Strategic Change in Higher Education: A Descriptive Study of Middle Managers Sensemaking of an Implemented Strategic Initiative at a Small New England Public Higher Education Institution* [Doctoral dissertation, Northeastern University]. <http://www.proquest.com/docview/2185944572/abstract/D4B8259E14684181PQ/1>
- Swing, R. L. (2009). Institutional researchers as change agents. *New Directions for Institutional Research*, 2009(143), 5–16. <https://doi.org/10.1002/ir.301>
- Swing, R. L., & Ross, L. E. (2016a). A new vision for institutional research. *Change: The Magazine of Higher Learning*, 48(2), 6–13. <https://doi.org/10.1080/00091383.2016.1163132>
- Swing, R. L., & Ross, L. E. (2016b). *Statement of aspirational practice for institutional research*. Association for Institutional Research. Retrieved February 1, 2022, from https://www.airweb.org/docs/default-source/documents-for-pages/statement-of-aspirational-practice-for-ir-report.pdf?sfvrsn=1d468d84_2

- Swing, R. L., Jones, D., & Ross, Le. E. (2016). *The AIR national survey of institutional research offices* (pp. 1–12). The Association for Institutional Research. https://www.airweb.org/docs/default-source/documents-for-pages/national-survey-of-ir-offices-report.pdf?sfvrsn=1ab5100b_4
- Taylor, M., Turk, J. M., Chessman, H. M., & Espinosa, L. L. (2020). *Race and ethnicity in higher education: 2020 supplement*. American Council on Education. <http://www.equityinhighered.org/wp-content/uploads/2020/11/REHE-2020-final.pdf>
- Teranishi, R. T. (2007). Race, ethnicity, and higher education policy: The use of critical quantitative research. *New Directions for Institutional Research, 2007*, 37–49.
- Terenzini, P. T. (1999). On the nature of institutional research and the knowledge and skills it requires. *New Directions for Institutional Research, 1999*(104), 21–29. <https://doi.org/10.1002/ir.10402>
- Taylor, M., Turk, J. M., Chessman, H. M., & Espinosa, L. L. (2020). *Race and ethnicity in higher education: 2020 supplement*. American Council on Education. <http://www.equityinhighered.org/wp-content/uploads/2020/11/REHE-2020-final.pdf>
- The Aspen Institute. (2017). *Renewal and progress: Strengthening higher education leadership in a time of rapid change* (pp. 1–44). (2017). https://www.aspeninstitute.org/wp-content/uploads/2017/05/Renewal_and_Progress_CEP-05122017.pdf
- Author Surname, First Initial. Second Initial. (Year, Month Day). Article title: Subtitle. *Newspaper Title*, page range. URL [if viewed online]
- The joint statement on analytics. (n.d.)*. AIR, EDUCAUSE, NACUBO. Retrieved November 15, 2022, from <https://changewithanalytics.com/statement/>
- Thurlow, A., & Helms Mills, J. (2015). Telling tales out of school: Sensemaking and narratives of legitimacy in an organizational change process. *Scandinavian Journal of Management, 31*(2), 246–254. <https://doi.org/10.1016/j.scaman.2014.10.002>
- UNM-Taos IPEDS data feedback report* (pp. 1–15). (2021). National Center for Education Statistics.
- UNM-Taos strategic plan 2014-2019 v 2.0* (pp. 1–121). (2015). University of New Mexico-Taos. https://taos.unm.edu/about/img/unm-taos_strategic-plan_v2.0_fall-2015_final_web_version.pdf
- U.S. Census Bureau (2019). *Selected demographic and housing estimates DPO5, 2019 American Community Survey 5-year estimates data profiles*. The Census

- Bureau.
<https://data.census.gov/cedsci/table?q=DP05&g=0500000US35055&y=2019>
- U.S. Department of Education (n.d.). *Definition of Hispanic serving institutions*.
<https://www2.ed.gov/programs/ideshsi/definition.html>
- Van Manen, M. (2016). *Phenomenology of practice: Meaning-giving methods in phenomenological research and writing*. Routledge.
- Valdez, P. L. (2015). An overview of Hispanic serving institutions legislation: Legislation policy formation between 1979 and 1992. In J. P. Mendez & I. F. A. Méndez-Negrete & R.T. Palmer (Eds.), *Hispanic-serving institutions in American higher education: Their origin, and present and future challenges* (pp. 5-29). Stylus Publishing, LLC.
- Villalobos Meléndez, A. (2022, September). *Census snapshot fall 2022*. [Infographic]. University of New Mexico-Taos Institutional Research.
<https://create.piktochart.com/output/57777462-spring-2022-census-snapshot>
- Villalobos Meléndez, A. (2022). *IR note no. 5: Native American students at UNM-Taos*. University of New Mexico-Taos Office for Institutional Research.
<https://create.piktochart.com/output/5901c53d7ee6-native-american-students>
- Viramontes, J. D. R. (2021). Critical race theory offshoots: Building on the foundations of CRT and emphasizing the nuances they offer. In *Handbook of Critical Race Theory in Education* (2nd ed.). Routledge.
- Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health Education & Behavior*, 24(3), 369–387.
- Warmington, P. (2014). *Black British intellectuals and education: Multiculturalism's hidden history*. Routledge.
- Weick, K. (1995). *Sensemaking in organizations*. Sage Publications.
- Wiley, C. A. (2022, August 4). *IR Professionals as Change Agents*. The Association for Institutional Research. Retrieved August 28, 2022, from
<https://www.airweb.org/article/2022/08/04/ir-professionals-as-change-agents>
- Williams, E. A., (2019, October 1). The evolution of diversity, equity, and inclusion positions in higher education institutions. *HigherEdJobs*.
<https://www.higheredjobs.com/Articles/articleDisplay.cfm?ID=2039>
- Wilson, J. L., Meyer, K. A., & McNeal, L. (2012). Mission and diversity statements: What they do and do not say. *Innovative Higher Education*, 37(2), 125–139.
<https://doi.org/10.1007/s10755-011-9194-8>
- Yin, R. K. (2018). *Case study research and applications: design and methods* (Sixth edition.). SAGE Publications, Inc.

APPENDIX A

CRITICAL SENSEMAKING DATA BRIEF PROTOCOL

Step 1

Presentation (10 - 15 minutes). The institutional researcher will present a quantitative analysis during the Admin Team Working Meeting using a slide presentation² (created on Piktochart), prioritizing visualizations illuminating equity gaps. The presentation will be designed to last no more than 10 to 15 minutes.

The proposed analyses will focus on topics related to recently established Key Performance Indicators (KPIs).

- Analysis of class credit completion
- Analysis of concurrent student population (HS, dual credit)
- Analysis of the adult student population (25+ years)

Step 2

Discussion (15 - 20 minutes). After the presentation, the researcher will encourage discussion and questions among the participants.

If discussion needs to be aided, the researcher will use the following prompts:

- What did you learn? What patterns do you notice in the data? Which student groups are experiencing inequities?
- How does the data compare to your previous understanding of this topic/student population?
- How can this learning inform adjustments in your area?

Logistics

The structure of the Admin Team Working meetings (9:00 am to Noon) is as follows (including the Critical Sensemaking Data Briefs):

1. (15 min) Check-in
2. (15 min) Critical Updates
3. (10 min) Deliverables Update
- 4. (30 min) Critical Sensemaking Data Brief**
5. (varied pre-planned durations) Agenda items defined at the end of previous meeting
6. (15 min) Items for weekly updates from Admin Team and agenda for next week's meeting

The participant and consent form will stipulate that the presentation will be recorded.

The Admin Team meetings' standard practice is that it is held in person in a conference room. However, as the needs arise, one or more participants may join the meeting via Zoom, resulting in a hybrid format. On occasion, if necessary, the meeting may be held fully on Zoom.

² Example of previous presentation created by the researcher: [LINK](#).

Step 3

Evaluation of the CSDB

Please select your level of agreement with the following statements:

(5-point Likert scale strongly agree to strongly disagree)

I learned something in today's session.

I can relate learnings from today to actions I can take in my role.

The presentation of the data analysis was effective & worth my time.

I wish we would have _____ today.

APPENDIX B
CSDB OBSERVATION PROTOCOL

Facilitator Observation Memos

Setting:
 Observer:
 Role of Observer:
 Date & Time:
 Length of Observations: ___ minutes

CSDB Session: (#3 - #5)
 CSDB Data Analysis Presented: Title (e.g., Analysis of adult student population)
 Participants present:

Metadata

Before the presentation begins

- General mood of participants
 - Perceptions of the interest in the topic
-

Descriptive Notes

- Questions asked
- Who asks questions
- Who engages in discussion about the data
- Body language and facial expressions of participants
- Tone of voice when participants ask questions and engage with each other

Reflective Notes

- My perceptions of
- How was the analysis received?
 - How well did I feel I presented the topic?
 - The participants' mood and engagement.
 - Who drives the conversation?
 - What directions does the discussion take?
 - How do participants react to different interpretations of the data by others?
-

During presentation

After presentation

- General mood of participants
 - General perception of how the session went
-

After the presentation (in my office)

Memo

- Summary of general perceptions of the success of the session.
 - Identify areas of improvement in terms of performing the analyses, presentation of the data, facilitating the discussion, and identifying potential adjustments to increase engagement or understanding.
-

APPENDIX C
INTERVIEW PROTOCOL

The interviews were conducted after all six sessions of the innovation were completed. A sample of seven participants were interviewed.

Domains of inquiry

The semi-structured interviews will focus on the areas of sensemaking, equity-mindedness, and data equity.

Initial Briefing

[Greeting: Good morning/good afternoon]. Thank you for agreeing to participate in this research study. This study aims to understand sensemaking processes among senior administrators. Your participation is voluntary and confidential. You may pause or terminate your participation at any time and for any reason. I have provided you with a formal consent form in advance. As outlined in the consent form, I will be recording our conversation to facilitate analysis, and I will notify you when the recorder is turned on and off. You will verbally record your consent to participate upon the initiation of the recording. You may now ask me any questions you have about the inquiry, the interview process, or any other questions you may have.

The interview may take approximately 45 minutes to an hour to complete.

Interview Questions

Construct	Question
Equity-mindedness, Sensemaking/RQ2	1. Do you believe equitable outcomes at UNM-Taos are possible, why or why not?
Equity-mindedness, Data equity, Sensemaking/RQ2	2. From your perspective, what are UNM-Taos' most pressing student outcome gaps, and what factors contribute to those gaps? What information has contributed to this understanding?
Equity-mindedness/RQ2	3. Why do you think inequitable outcomes exist at UNM-Taos?
Equity-mindedness/RQ2	4. To what extent do you think equitable and successful student outcomes are the responsibility of the institution, and to what extent are the responsibility of the student?
Sensemaking/RQ1	5. How do you describe your experience of participating in the data briefs?
Sensemaking/RQ1	6. How would you compare your personal process of making sense of data when participating in the data briefs to previous times when I just sent you some type of data document (Excel file, report, infographic, etc.) via email?

Sensemaking/RQ1	7. When participating in the data briefs, what features were the most helpful and the most challenging parts?
Sensemaking, Data equity/RQ2	8. Have the data briefs changed your understanding of inequitable outcomes at UNM-Taos? If so, how? Can you provide an example?
Sensemaking, Data equity/RQ2	9. Do you think we should continue the data briefs as an ongoing practice? Why or why not?
Sensemaking, Data equity/RQ2	10. What is one thing that you'll keep doing, start doing, or stop doing based on what you learned in a data brief?

Debriefing

At this point, I do not have any other questions to ask you. Is there anything I have not asked you that you would like to add?

[If the answer is yes, the interviewee will continue, and the recorder will stay on].

[If the answer is no, the recorder will be turned off].

I will now turn off the recorder. Thank you, again, for sharing your experiences about making sense of data and equitable student challenges at UNM-Taos. The information you provided advances my understanding and will inform the research findings.

References

Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage.

Kvale, S., & Brinkmann, S. (2015). *InterViews : learning the craft of qualitative research interviewing* (Third edition.). Sage Publications.

APPENDIX D
PHOTOVOICE PROTOCOL

Professional roles and equitable student outcomes

Please review and follow the instructions below.

Step 1

Create or collect one image (take an original photograph, a digital copy of a painting, sculpture, or other visual) that conveys what it feels like to be professionally responsible for equitable student outcomes.

Step 2

Write a one-page, or create a voice recording, of your reflection about your image.

- Why did you choose this image?
- Describe how the image reflects how you feel about your professional responsibility toward equitable student outcomes.

Step 3

Submit your image and reflection to the researcher using this form: [LINK](#).

Step 4

Participants will share their images with the group. The written or recorded reflection will not be shared with the team. However, be prepared to talk about your image and comment or ask questions about images created by other participants.

APPENDIX E
CSDB #6 HANDOUT



- 1) What does it **feel** like to be professionally responsible for advancing equitable student outcomes? **Why?** (You may identify a feeling(s) from the word cloud or any other feeling you experience).
- 2) Data presented in the IR data briefs showed measurable and significant outcome gaps by race/ethnicity and gender among our students. What **feelings** do you experience when you think about systemic outcome gaps among UNM-Taos students and your leadership role at UNM-Taos?
- 3) How do you interpret the similarities and differences and differences between the images?
- 4) Is there anything in these images that surprised you or caught your attention?

APPENDIX F

SHARED MEANING UNITS AND MEANING CLUSTERS

Meaning Units (excerpts)	Meaning Clusters
Trying to grasp new information in the moment (N=5)	Initial Reactions
Defensiveness impulse/surprise (N=4)	
Understanding the content (N=2)	
Importance of visuals (N=2)	
Quality of information (N=1)	
Including qualitative data (N=1)	
Time dedicated to CSDB (N=13)	Anticipation & Contending with Assumptions and Group Dynamics
Reflection (as non-business) (N=5)	
Reading the room (N=9)	
Reflection exercises create connection (N=9)	Role of Reflection in Data Sensemaking
Reflection set the tone for data analyses (N=8)	
Emotional response to data (N=6)	
Discussion/group sensemaking (N=22)	Process for Sensemaking & Expanding Understanding
Expanding understanding (N=14)	
Digging deeper (N=10)	
Being able to ask questions (N=5)	
Professional role as mediator for sensemaking (N=4)	
Diversity of perspectives (N=3)	
Adjusting perceptions of IR (N=7)	Adjusting Perceptions of IR
Role of the presenter/IR leading discussion (N=14)	
Overall reaction to CSDBs (N=4)	Distilling the complexity of the experience into basic perceptions of it
IR Notes (N=2)	

APPENDIX G

MEANING CLUSTERS AND PORTRAYALS OF EXPERIENCE

Meaning Clusters	Portrayal of Experience
<p data-bbox="250 285 464 317">Initial Reactions</p> <p data-bbox="250 363 630 491">Anticipation & Contending with Assumptions and Group Dynamics</p> <p data-bbox="250 537 602 667">Distilling the complexity of the experience into basic perceptions of it</p>	<p data-bbox="667 285 1393 464">Portrayal of Experience 1. Participants experience initial reactions, anticipation, assumptions, and group dynamics before, during, and after the data sensemaking brief.</p>
<p data-bbox="250 716 630 844">Anticipation & Contending with Assumptions and Group Dynamics</p> <p data-bbox="250 890 581 972">Role of Reflection in Data Sensemaking</p>	<p data-bbox="667 716 1393 844">Portrayal of Experience 2. Participants may have contradictory perceptions of reflection in the process of collective data sensemaking</p>
<p data-bbox="250 1020 602 1102">Process for Sensemaking & Expanding Understanding</p>	<p data-bbox="667 1020 1393 1192">Portrayal of Experience 3. Group sensemaking is integral to expanding the diversity of perspectives and understanding and planting the seed for deeper analysis and action.</p>
<p data-bbox="250 1241 602 1272">Adjusting Perceptions of IR</p>	<p data-bbox="667 1241 1393 1369">Portrayal of Experience 4. Participants may adjust or advance their perceptions of IR due to their engagement in sustained and structured communication.</p>

APPENDIX H

PHOTOVOICE IMAGES AND REFLECTIONS METADATA

Images Provided by Participants



Participant Written Reflections Word Counts

Participant (not IDs)	Image	Word Count	Present CSDB#1 Discussion	Present CSDB#6 Discussion
#1	Colored Pencils	174	Y	Y
#2	Looking over a fence	437	Y	Y
#3	Gardening	143	Y	Y
#4	Education: the fire in the darkness	624	Y	Y
#5	Kids playing basketball	189	Y	Y
#6	Stairs drawing	438	Y	Y
#7	NA	NA	Y	Y
#8	NA	NA	Y	Y
#9	NA	NA	N	Y

Duration of Reflection Discussions

Brief	Date	Duration
CSDB#1 Images Discussion	4/11/2023	22:06 min
CSDB#6 Images Discussion	6/20/2023	33:37 min

APPENDIX I

SAMPLE OF INVIVO AND VALUES CODES, CATEGORIES AND CLUSTERS

InVivo Codes	Values Coding	Category	Cluster
"a number of them fall under my umbrella"	A: cares about doing a good job	Defensiveness impulse/surprise	Collective Sensemaking
"is my department reflected in the data?"	A: cares about doing a good job	Defensiveness impulse/surprise	Collective Sensemaking
"one of the areas where I've really grown"	B: change is happening	Engaging with data	Collective Sensemaking
"we became used to looking at numbers"	B: change is happening	Engaging with data	Collective Sensemaking
"looking at data"	V: data is important	Engaging with data	Collective Sensemaking
"need to be more data-informed"	V: data is important	Engaging with data	Collective Sensemaking
"building the chops ... to be interested in questions"	V: learning/inquisitiveness	Engaging with data	Collective Sensemaking
"it's really exciting to see people excited about data and curious about data"	V: learning/inquisitiveness	Engaging with data	Collective Sensemaking
"an opportunity to engage and get immediate clarification"	B: Discussion expands understanding	Being able to ask questions	Expanding Understanding

"have a chance to ask questions and get explanations"	B: discussion expands understanding	Being able to ask questions	Expanding Understanding
"if I had to choose, I'd like the group setting"	B: discussion expands understanding	Discussion	Expanding Understanding
"very helpful to be able to listen to that as a team"	B: discussion expands understanding	Discussion	Expanding Understanding
"very ... collaborative group dialogue"	B: discussion expands understanding	Discussion	Expanding Understanding
"discuss it in a group fills out the chapter"	B: discussion expands understanding	Diversity of perspectives	Expanding Understanding
"huge value ... to review it together ... with different perspectives and priorities"	B: discussion expands understanding	Diversity of perspectives	Expanding Understanding
"I'm processing it based on a very narrow perspective of my understanding"	B: discussion expands understanding	Diversity of perspectives	Expanding Understanding
"able to express things that other people were not bringing up"	V: diversity of perspectives	Diversity of perspectives	Expanding Understanding
"adjacent perspectives can	V: diversity of perspectives	Diversity of perspectives	Expanding Understanding

bring value and
insight too"

"having others in the
room to be able to
have that
conversation
together is helpful"

V: diversity of
perspectives

Diversity of
perspectives

Expanding
Understanding

Note: A means 'attitudes', B means 'belief', V means 'Values'.

APPENDIX J
SUBSET OF CATEGORIES AND CLUSTERS

Category	Cluster
Dialogue requires trust	Trust & Reflection
Group reflection creates a connection	
Reflection sets the tone for sensemaking.	
Professional purpose	
Reflection as non-business	Collective Sensemaking
Trying to gather information at the moment	
Defensiveness impulse/surprise	
Importance of visuals	
Including qualitative information	
Lived experience as filter	
Professional role as filter	
Uncomfortable facts	
Reading the room	
Individual Sensemaking	
Engaging with data	
Emotional response to data	
Being able to ask questions	Expanding Understanding
Discussion	
Diversity of perspectives	
Expanding understanding	

Role of presenter

IR Scaffolding Sensemaking

IR Sensegiving

Adjusting perceptions of IR

Digging deeper

Motivating action

Moving to action

Using data for improvement

Make it a practice

Dedicated time for consuming data

Time dedicated to CSDB

Overall perception of CSDBs

APPENDIX K
IRB APPROVAL

EXEMPTION GRANTED

Elisabeth Gee
 MLFTC: Educational Leadership and Innovation, Division of
 480/965-4284 Elisabeth.Gee@asu.edu
 Dear Elisabeth Gee:

On 3/27/2023 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Leveraging institutional research to support data sensemaking among senior community college leaders to advance student equity understanding
Investigator:	<u>Elisabeth Gee</u>
IRB ID:	STUDY00017746
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Approval for External IRB, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • CITI Training Certificate, Category: Other; • Consent, Category: Consent Form; • Correspondence with UNM IRB, Category: Other; • Correspondence with UNM IRB_n2, Category: Other; • Fully executed IAA, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • Protocol VillalobosMelendez, Category: IRB Protocol; • Recruitment Email, Category: Recruitment Materials; • Response Letter to Request for Modifications, Category: Other;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2)(ii) Tests, surveys, interviews, or observation (low risk) on 3/24/2023.

In

	<ul style="list-style-type: none">• Supporting Documents, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);
--	--

conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

When consent is appropriate, you must use final, watermarked versions available under the “Documents” tab in ERA-IRB.

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required.

Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrador

cc: Alejandra Villalobos Melendez Alejandra
Villalobos Melendez