

USING CLOSE-TO-PRACTICE DATA TO EMPOWER DEI-SERVING UNITS AT
WESTERN CAROLINA UNIVERSITY

A disquisition presented to the faculty of the Graduate School of
Western Carolina University in partial fulfillment of the
requirements for the degree of Doctor of Education

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DEDICATION

This disquisition is dedicated to my family. My kind, talented, creative, and beautiful 11-year-old daughter, Cadence is the light that makes my world bright. Being your mother has made me a better person in every way, including my desire to model commitment to lifelong learning and dedication to personal growth and improvement. We struggle through school together and help support each other. I am so intensely proud of you and proud of the mother that I am for you.

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ABSTRACT

USING CLOSE-TO-PRACTICE DATA TO EMPOWER DEI-SERVING UNITS AT WESTERN CAROLINA UNIVERSITY

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Western Carolina University (WCU) enrolls students from many different backgrounds and demographic categories. While access to the institution has expanded over the years, equity gaps still exist relative to retention and graduation outcomes for students in different demographic groups. Several offices at the University offer programming and support for specific marginalized student populations. These offices are generally small, and do not have the data access or necessary expertise to effectively utilize data in their operations. The concept of this initiative is that success for marginalized student populations at WCU is tied to the success of these offices that support them. The success of these supporting offices is then tied to their ability to access and use data to seek funding, plan programming and offerings, and communicate with a wide variety of stakeholders (such as administrators, current and prospective students, and alumni). The initiative centers on the development of quantitative and qualitative reports and tools that utilize close-to-practice data, and then training/consultation about how stakeholders can use these data for funding requests, departmental planning, and stakeholder communication. The work took place with Intercultural Affairs and focused on their intensive program offering, Project C.A.R.E. (an acronym for Culturally Aligned Retention Enhancement). This program seeks to provide a welcoming transition and support community for new students, particularly African American and Latinx students, as they enter WCU, a predominantly white institution (PWI). Improvement Science was used as a framework for the project, incorporating techniques for problem identification, causal analysis, development and selection of change idea, and iterative and collaborative execution of these intervention steps, with pre-defined

formative and summative data collection and assessment activities throughout the project timeline. Post-initiative participant interviews measured whether this project resulted in an improvement relative to data access and the ability to utilize data for resource advocacy, departmental planning, and stakeholder communication.

Keywords: close-to-practice data, Improvement Science, resource advocacy, departmental planning, stakeholder communication

The Disquisition

The disquisition is a specialized format, related to a dissertation, with a focus more closely aligned with the scholar-practitioner role of Doctorate in Education (Ed.D.) students, rather than the theoretical focus of traditional Ph.D. dissertations. The Ed.D. is intended, “for managerial and administrative leadership in education,” to integrate practical, lived, on-the-job experience with theory and scholarship (Shulman et al., 2006, p.26). The Ed.D. program at WCU nurtures and matures students as both scholars and practitioners who are trained to understand systems and institutional challenges and opportunities through a lens of research and scholarship, and then apply their knowledge, using their institutional access and positionality, directly to the educational institutions where they lead. The Ed.D. is an applied degree, and the disquisition is similarly an applied capstone experience for the doctoral work. The disquisition at WCU specifically utilizes an Improvement Science methodology, is shaped by critical theory and scholarly research, and engages the candidate in the application of the concepts in a direct and applied manner through the development and implementation of an intervention within their local institution, focused on improvement of equity within that system.

Introduction

Higher education in the United States is serving an increasingly diverse student population. As the country becomes more racially diverse, the college-going population reflects this same diversity trend. Over the last several decades the portion of students of color enrolled in college has increased, while the percentage of white students has declined. Between 1980 and 2014, “the share of white student enrollment ... declined by more than 25 percentage points” (Office of Planning, Evaluation and Policy Development, 2017, p.19). Some populations have experienced particularly dramatic growth in higher education in recent years. Latinx students, for example, are enrolling in higher education at historic rates in the United States. Between 2000 and 2016, the percent of Latinx people between the ages of 18 and 24 in the U.S. enrolled in college increased from 22% to 39% (National Center for Education Statistics, 2019a).

Similarly, college attendance for students with documented disabilities has increased tremendously (as has the more expansive way that the federal government defines disability for this purpose). In 2003-04, the National Center for Education Statistics reported that 11% of undergraduates had a self-disclosed disability (National Center for Education Statistics, 2005). By 2015-16, that percentage had increased to over 19% of undergraduates, and notably the definition had expanded over the years to include “mental, emotional, and psychiatric conditions” such as learning disabilities, depression, and attention deficit disorder (National Center for Education Statistics, 2021).

Student diversity has also increased in a number of other ways. Students are more likely to work and have children or other significant family obligations (Field, 2022; Marcy, 2004). While colleges and universities have served students from military backgrounds for decades, the focus on the success of that group, and the belongingness they perceive in campus environments, is receiving renewed attention (Barry et al., 2021). And higher education institutions and systems across the country are looking at re-engaging older adults in higher education, particularly as the number of traditionally aged college students shrinks, a trend reflective of America’s declining birth rates (Grawe, 2018; McClellan, 2022).

While higher education institutions are responding to this increasing diversity in a variety of ways, in many cases the response still falls far short of what is required to ensure success for the range of students they are attempting to serve. Many institutions, professional associations, and individual members of higher education communities have made rhetorical commitments to the value of demographic diversity and the Academy's obligation to serve students from diverse backgrounds. But a "progressive" intellectual commitment to diverse student populations is not sufficient to practically ensure that students from diverse backgrounds and demographic groups have an equitable higher education experience or opportunity for college success (Dowd & Bensimon, 2015). Rather, it is an ethical imperative for organizations to align their professed values with their administrative structure, processes, and actions (Capper, 2019). Investing in departments and programming that support specific marginalized populations is a tangible strategy for impacting the student experience and improving the likelihood of positive academic outcomes. Investment is a mechanism for actualizing this institutional commitment. This project helps lay the foundation for investment in this type of programming and departmental personnel, by demonstrating the reach and impact of these services and departments on the target student populations.

Literature Review

Decision-makers are hungry for data. Data is particularly critical to both local planning efforts and accreditation requirements when it's the kind of data that help an organization fulfill its mission and/or strategic directions and then document/assess that impact. Leaders look to researchers and analysts to help them tap into data and interpret the information to guide among competing interests and potential policy decisions (Bogensneider & Corbett, 2010). Leveraging data and analysis/reporting expertise for the benefit of departments that serve marginalized student populations, is an excellent first step toward empowering those units, which may eventually lead to securing additional resources, and ultimately serving more students and/or providing deeper support to the existing student populations. Likewise, in an environment where larger units are data-informed, "[f]ailing to use data in equity-minded ways can stymie institutional learning and change, leaving equity gaps unchanged" (McNair et al., 2020, p. 54).

Units that engage in DEI work need access to data and analysis tools to support their work and keep them fiscally competitive with larger units and larger institutions (in the case of federal or state grant applications, for example). Student support service staff/units especially may not have access to and/or may not be routinely collecting information that could help them understand their impact and the student perception of services (McNair et al., 2020, p. 105).

Increasing data usage in student support departments can help with this effort. Like other administrative tools, the development of the tool itself is not enough. The key potential in this area is in analyzing and understanding the data, and then using that knowledge to shape processes and programming; in other words, using the data to drive institutional change (Webber & Zheng, 2020).

It seems self-evident that data can and should be used to inform institutional efforts, but on many campuses, data are not as available as outsiders may presume (Attaran et al., 2018). Even when a data environment has been built, getting the right kind of data access to the right users (especially those who don't occupy the most senior-level university positions) is challenging. Ensuring that, beyond access, institutional stakeholders understand where data are located, how to access them, and how to use data to inform decision-making is not common (Smith, 2009). But the effort is worth the investment. Data are a key mechanism for organizational learning, which can improve student outcomes, and ultimately contribute the various aspects of inclusive excellence goals (Smith, 2009). Assessing goals of this nature demands measurement, and this measurement necessitates data. There really is no way to confidently measure and track progress on these diversity and success goals devoid of data. And the role of data analysts is particularly critical in bridging the span between institutional efforts and outcomes (Smith, 2009).

University data are typically offered at a very high level. Descriptive statistics are provided for population counts in demographic categories. Institutions count and compare enrollment, credit hour production, course offerings and section sizes, faculty workload and sections taught, financial aid, room utilization, and grade distribution. While these data are interesting and may point to organizational strengths and weaknesses, or identify high-level areas for improvement, that kind of reporting alone does

not provide the best evidence for improvement efforts. Close-to-practice data, data looking at smaller groups of specific students for example, is by its nature more actionable, but harder to obtain (Dowd et al., 2018). “Small data” studies will remain useful, even in an era of big data, precisely because of their ability to answer very targeted questions (Kitchin & Lauriault, 2015).

High-level institutional data are provided on university websites, through “Fact Books”, and through state and national databases and clearinghouses, like the Integrated Postsecondary Education Data System, commonly known as IPEDS (Integrated Postsecondary Education Data System, n.d.). “Yet, handcrafted, small data are oftentimes needed when staff would like to direct resources to students who need them the most” (Dowd et al., 2018, p. 6). Unlike required reporting to federal or state governments or accrediting bodies, these small datasets and analysis of select local student populations are not typically mandated and not as routine, and for this reason, require local interest and resource commitment.

In contrast to these high-level reporting frameworks, “local data use involving reflective practice will be the source of the new knowledge that is needed to deconstruct and reconstruct higher education in a more equitable way” (Dowd & Bensimon, 2015, p. 157). Fine-grain data provide an opportunity for deeper understanding of specific populations, programs, and outcomes. While this kind of reporting is atypical for Institutional Research offices, where the focus in many cases has been limited to regulatory reporting for state, federal, and accreditation bodies, “small N’s” offer the best opportunity for program administrators to use data to inform decision-making and planning efforts (Dowd & Bensimon, 2015, p. 159). In fact, this ground-level data exposure and analysis enables “practitioners to become researchers of their own practice,” engaging in local improvement efforts and then monitoring the results (Dowd & Bensimon, 2015, p. 22).

Fine-grained quantitative data, especially when it is combined with locally collected qualitative data, can help program administrators and departmental leaders understand their specific contributions toward high-level university goals and outcomes. These kinds of data sources provide both hard figures and context, allowing local actors to understand not just what is happening, but also how and why (McNair et al., 2020). For this reason, close-to-practice data are actionable data. These data, when they

can be made available, empower those able to implement changes at the ground-level with the data insights to know what changes may be an improvement, and then the tools to monitor the outcomes of improvement efforts that are implemented (McNair et al., 2020).

Safir and Dugan (2021) advocate for moving from “satellite data”, which are very high-level, top-down, quantitative data about populations (in this case retention and graduation rates by race and ethnicity, for example), to “street data,” which they characterize as more ground-level, subpopulation focused, thicker, and more qualitative. They argue that “satellite data,” which are the most typical way that institutions report and display data, reinforce racism, classism, ableism, and the like, by providing the user a view that naturally aligns with a deficit-based perspective (Safir & Dugan, 2021). This type of reporting reinforces the concept that performance gaps between underrepresented and majority populations are inherent to the people in the groups, rather than the systems and institutions that treat students inequitably (Safir & Dugan, 2021). “Street data” on the other hand, are ground-level data, centered on the people at the margins, and focusing on strengths, gains, and lived experience (Safir & Dugan, 2021). These types of data and perspective for reporting can be more challenging, and require more intentionality and institutional will, but are far more likely to promote equity.

Close-to-practice, disaggregated data, combined with the time, space, and expertise to analyze and “unpack it,” can offer the most meaningful way to use data to drive decision-making (Dowd et al., 2018). In the case of this project, decision-making could be related to knowing which financial resources to request, and justifying the proposed expansion (e.g., demonstrating the efficacy of a program, and requesting funds to increase the size or improve the quality). Decision-making also refers to planning, and internal resource allocation, for both budgets and personnel. These data can help program directors plan for the most effective mix of programming, and then advocate for expansion of their efforts through demonstration of prior success. Connecting those who are knowledgeable about data, including how to collect, store, manage, surface, and analyze data, with those who work directly with student populations, can be a very powerful strategy (Dowd et al., 2018). The expertise of these two groups combined is the key to connecting data to student experiences and outcomes to program practices.

As higher education institutions across the nation grapple with how to implement meaningful change, pressure around finances and staffing can make the situation more challenging to navigate. Moving beyond the rhetoric of position statements and facility names can require tangible resources, like personnel and programming, which require funding. However, resource growth has slowed significantly in recent years (Doyle & Delaney, 2009). Across the nation, state-based funding through legislative appropriations has declined, leaving institutions (particularly those without significant research funding), with tough choices about how to invest increasingly limited resources. Declines in enrollment related to the shrinking of the traditionally aged college student population exacerbate the already challenging budgetary environment (Bryan, 2021; Grawe, 2018). With a growing list of needs, from increasing faculty lines and research capacity, funding student support services, and investing in residential life offerings (in an environment where gyms, dining halls, and other perks differentiate college student choice), investing in diversity, equity, and inclusion (DEI) can be a challenging case to make.

But higher education institutions underfund DEI initiatives and personnel at their own peril. Higher education populations are changing, and institutions that address and invest in supporting the changing student body are more likely to thrive in the new era of higher education (Marcy, 2004). It requires investment to recruit and successfully retain students from marginalized demographic groups, but this investment can pay dividends for institutions that have the will and foresight to employ this strategy (Lasher & Greene, 2001). And with declining enrollment and retention numbers at institutions across the nation since the beginning of the pandemic, programs that positively impact both the enrollment and retention of diverse student populations become even more critical, in terms of institutional competitiveness, viability, and financial management (Weissman, 2021).

Like most other sectors globally, higher education is turning to data to analyze operations and inform decision-making. Data are collected about virtually every element of university operations, but to a large degree those data are not yet being disaggregated and utilized close-to-practice (Dowd & Bensimon, 2015). Data can be an extremely powerful tool, informing programming decisions and planning, assessing operations, and creating post-hoc narrative explaining and documenting the impact of

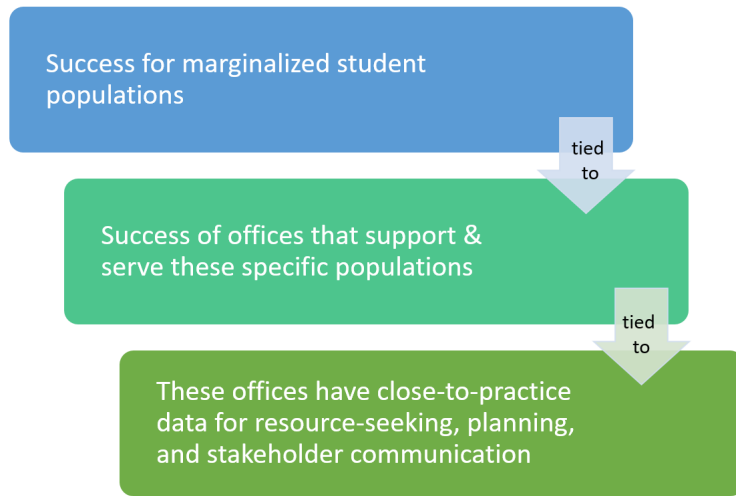
prior offerings and services. But to provide this formative and summative value at the department or program level, institutions must disaggregate the data, and deliver them directly to those closest to the operation (Dowd et al., 2018). Close-to-practice data can be especially meaningful and actionable as a tool for promoting equity, such as with student populations marginalized because of their racial, age, or ability demographics, or other factors like first-generation, low-income, or military status (McNair et al., 2020).

The Problem of Practice

This disquisition links the concept of student success for marginalized student populations at Western Carolina University (WCU) with the offices that specifically serve them. This linkage is supported by research showing that institutional offices that support marginalized student populations can cultivate a sense of belonging and help students build crucial social support networks (Garces et al., 2022; Leath et al., 2022). The problem of practice further links the success of those offices with their ability to access and use close-to-practice data to effectively assess and tell the story of their impact on student populations. Ultimately, this project ties together how access to data can help DEI-serving offices advocate for additional budget or other resources, utilize their existing resources effectively through departmental planning, and communicate their impact to a variety of audiences (such as current students, prospective students and their parents, administrators, and alumni/donors). See Figure 1 for a diagram of these linkages.

Figure 1

Diagram of Problem of Practice Linkages



Problem of Practice - Offices that support marginalized student populations at WCU do not have the data access or necessary expertise to effectively utilize data for resource-seeking (for internal and external funding sources), planning, and stakeholder communication.

Theoretical Framework

Theoretical frameworks can provide a perspective or epistemology, which enables the user to apply a foundational knowledge and a “worldview,” through which to understand, integrate, and interrogate literature, interactions, and observations (Capper, 2019). Critical Theory Epistemology is a framework that is used to examine the issue of increasing diversity in higher education, and the social justice implications of disparate access and outcomes for students from different backgrounds, both historically and presently, within the higher education sector in the United States. This theory provides a lens with which to view organizations and systems as the source of suffering through systemic oppression and allows for examination of that foundational oppression (Capper, 2019; Capper et al., 2020). Critical Theory Epistemology also centers “social justice praxis” through a reunion of “facts with values” (Capper, 2019, p. 69). In other words, this critical framework requires that the facts of organizations and

leadership decisions be informed and guided by the espoused values of those organizations. Stated values, strategies, and goals must be aligned with facts about how the organization operates (including enrollment, personnel, finances, and management realities.) Finally, Critical Theory Epistemology seeks to disrupt historic and uneven power differentials through the elevation of the voices of the oppressed (Capper, 2019; Capper et al., 2020). Intentional involvement and empowerment of the people who have historically been marginalized, can change organizational culture, and enable institutions to legitimately begin the process of dismantling systems, policies, and practices that oppress.

Causal Analysis

Improvement Science is a research approach positioned between scholarship and practice, aiming to capitalize on both standardized and systematic methods for knowledge acquisition and the practicality of application and adaptation to local conditions. This process employs hypothesis setting and testing, data collection through quantitative and qualitative means, and data analysis, which then feeds into the next cycle in this iterative process (Cohen-Vogel et al., 2015). Root cause analysis, utilizing a tool often called a Fishbone Diagram, is a key step in the Improvement Science approach. Using this approach, the problem is identified in the box to the left, and major causes are identified in the boxes representing the “bones” of the problem. The problem is further delineated using sub-components fleshed out on each bone. This tool is particularly effective at broadening the perspective about all the elements that contribute to a given problem, so that the scholar-practitioner can identify specific elements that cause or contribute to the problem, which would be appropriate for intervention. Not every cause is ripe for change. Using a root-cause analysis allows for a full range of causes to be examined, and therefore increases the likelihood of finding elements that do present in-roads or opportunities for leverage.

The Fishbone Diagram below (Figure 2) fleshes out the following problem - departments at WCU, which serve diverse and marginalized student populations, lack critical data and information needed for resource-seeking, planning, and stakeholder communication. There are four primary causes identified. First, WCU is in the process of implementing a new data environment. This data environment is composed of an altogether new structure, which is still under development. Additionally, there are new

positions (and new people in those positions) to support this function, as well as new tools and technology. These tools require licenses (that can be a significant departmental cost) and perhaps even more importantly, use of the tools requires specialized technical expertise. Overall, the entire process is immature and developing.

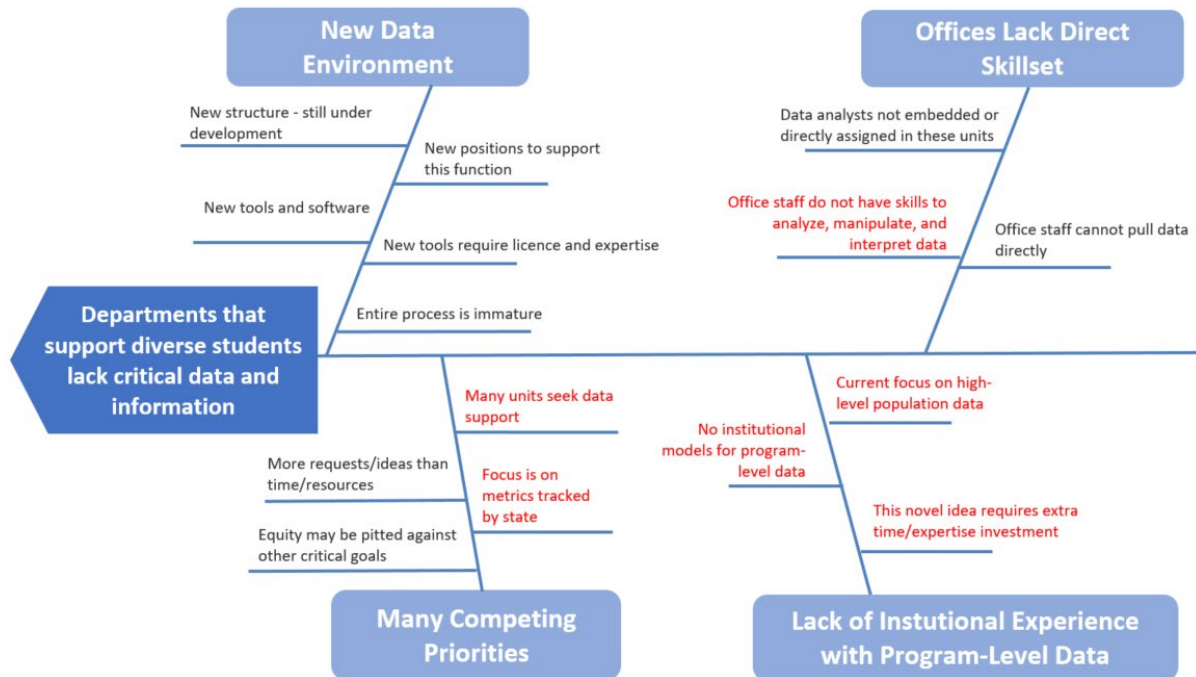
In the new data environment, there are many competing priorities; there are many more data needs than available resources to address them, and the current backlog for developing requested reports is estimated to be several years long. Many units across the institution seek data support. Because the demand for data significantly outstrips the supply of analysts able to fulfill requests, some requests go unmet. The requests that are prioritized are often the ones tracked externally, like those monitored as key performance indicators by the UNC System. In this way, requests related to equity may be pitted against, or competing for, finite resources that are ultimately allocated to other critical data needs and goals.

Small offices that serve specific diverse student populations often lack direct access and in-house skills to delve into data independently. Data analysts are not imbedded or assigned to assist specific units. And because of the cost, restricted data source access, and technical expertise required, staff in these departments generally cannot pull, manipulate, analyze, and interpret data directly from the source systems. Lacking this in-house capacity, and without the gravity that would cause the institution to prioritize these requests (when compared, for example, with high-level enrollment modeling or analysis related to funding streams), requests for reporting of this nature languish indefinitely.

Finally, WCU as a whole lacks experience with producing program-level data. At this stage in the development of the data environment, the current focus is on high-level population data. There are currently few institutional models for producing program-level data, particularly data that is useful for analyzing the impact of programs on student success. This novel idea will require the investment of extra time and expertise to develop. (See Figure 2 for the full casual analysis.) The elements in red are addressed in part by this disquisition.

Figure 2

Causal Analysis Fishbone Diagram



Problem of Practice within the Local Context

WCU is a regional comprehensive university located in the rural mountain town of Cullowhee, North Carolina. The institution was established in 1889 and has grown from a secondary school to a teacher’s college, to a regional university offering undergraduate, masters, and select doctoral degree programs (Western Carolina University, n.d.). In the most recent fall semester, WCU enrolled 11,635 students, up from 9,352 in fall of 2011, a 24% increase in enrollment during that decade (Western Carolina University, Quick Facts, 2022).

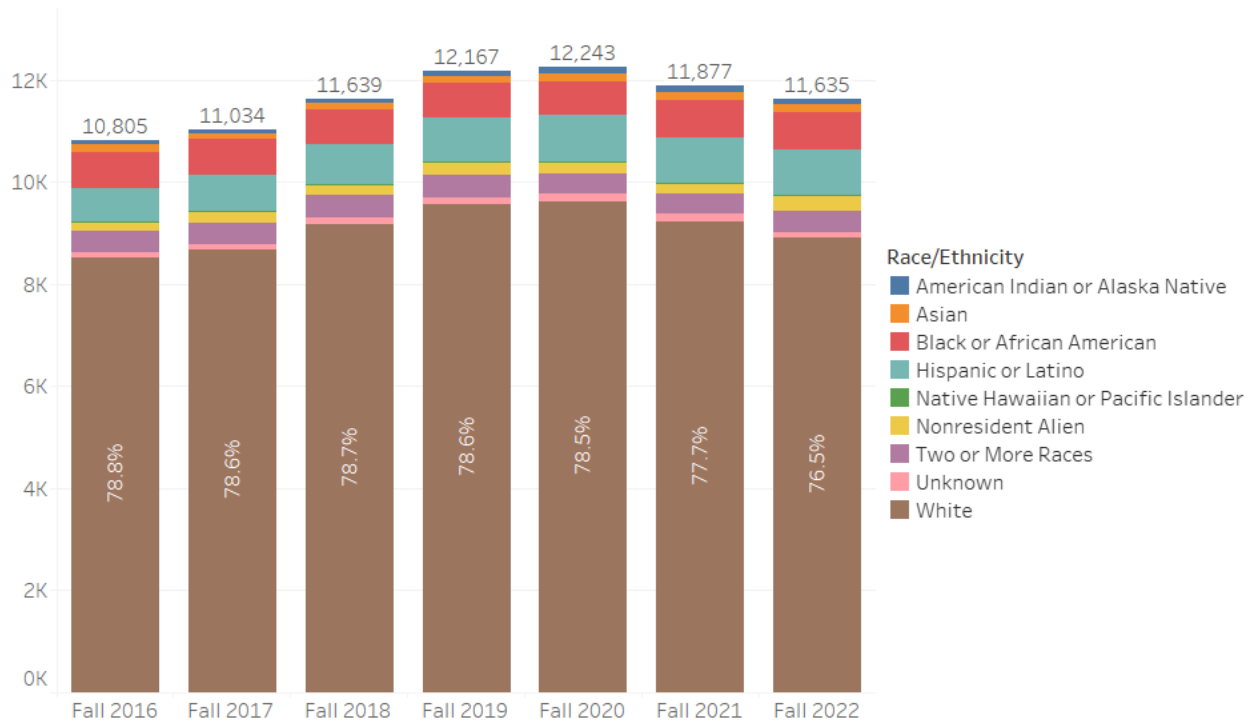
The University has also increased the diversity of the student body in recent years. In terms of magnitude, the number of students of color increased 15.7% between 2016 and 2022, from 1,999 to 2,312 (see Figures 3 and 4). This follows a similar arc to enrollment across the nation, with increasing enrollment of students of color, mirroring shifts in the country’s overall population (though a significant gap still exists in the type and level of institutions enrolling these students) (Office of Planning,

Evaluation and Policy Development, 2017). While institutional diversity is increasing, the institution is still predominantly white. In fall of 2022, out of 11,635 total WCU students, 742 were African American (accounting for 6.4%) and 891 were Latinx (accounting for 7.7%). There were 8,905 white students, which accounts for 76.5% of the institutional population. WCU is more diverse than Jackson County, where the institution is located, which is approximately 2.4% African American and 6.6% Latinx (US Census Bureau, 2022a). However, the institution is not nearly diverse as the state of North Carolina, even though it draws students from across the entire state. North Carolina as a whole has an estimated 22.3% African American population and 10.2% Latinx population (US Census Bureau, 2022b).

While gaps in admissions have been closing, gaps in student success, generally measured by freshman-to-sophomore year retention, and ultimately graduation, still represent a serious concern. These challenges can be particularly pronounced for African American, Latinx, and other racially and ethnically underrepresented students at predominantly white institutions (PWIs) like WCU (Rodgers & Summers, 2008). The National Center for Education Statistics notes that for the 2010 cohort, the graduation rate six years after enrollment ranged from a high of 74% for Asian students to a low of 40% for African American students and 39% for American Indian and Alaskan Native students (2019b).

Figure 3

Students Enrolled in Fall Semester: 2016-2022

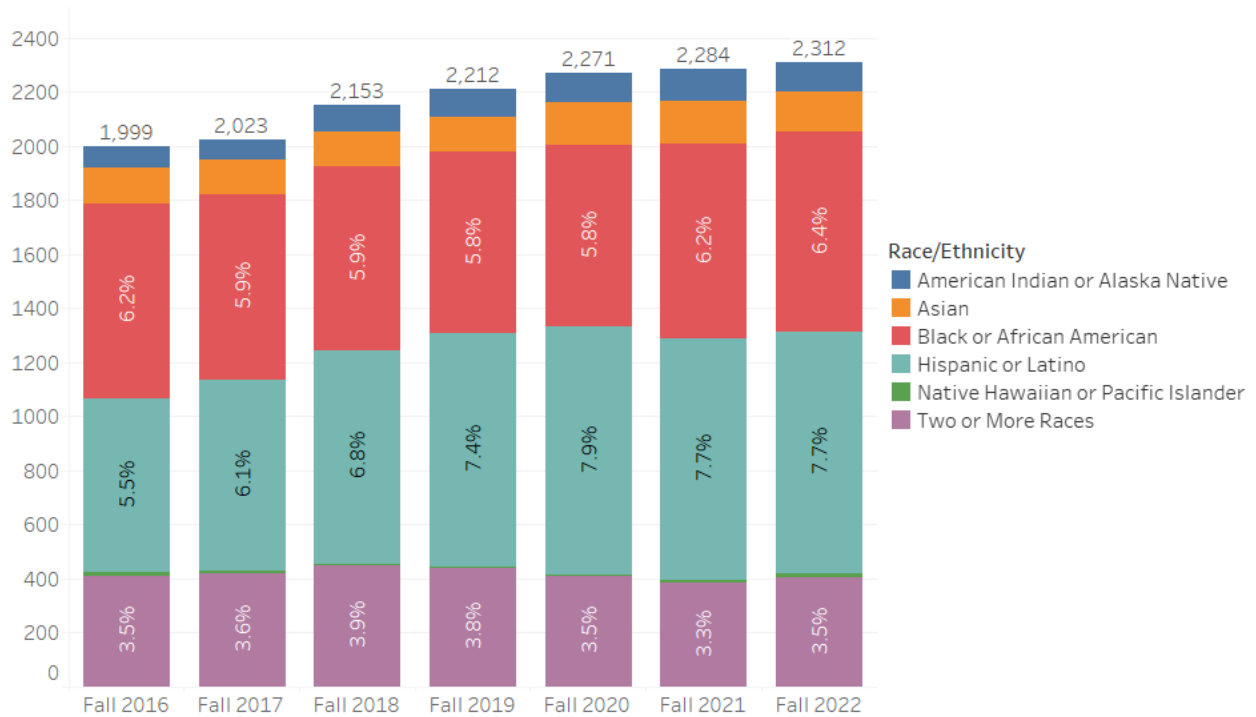


(Western Carolina University, Student Enrollment, 2022)

Note: These categories and labels were provided by the data source and align with federal government definitions for reporting to IPEDS. According to federal definitions, all people who report Hispanic or Latino ethnicity are counted as Hispanic or Latino regardless of other race options for which they may self-identify. The data were provided by the source identified, but the visualization was re-created for clarity.

Figure 4

Students Enrolled in Fall Semester (all student who are not White): 2016-2022



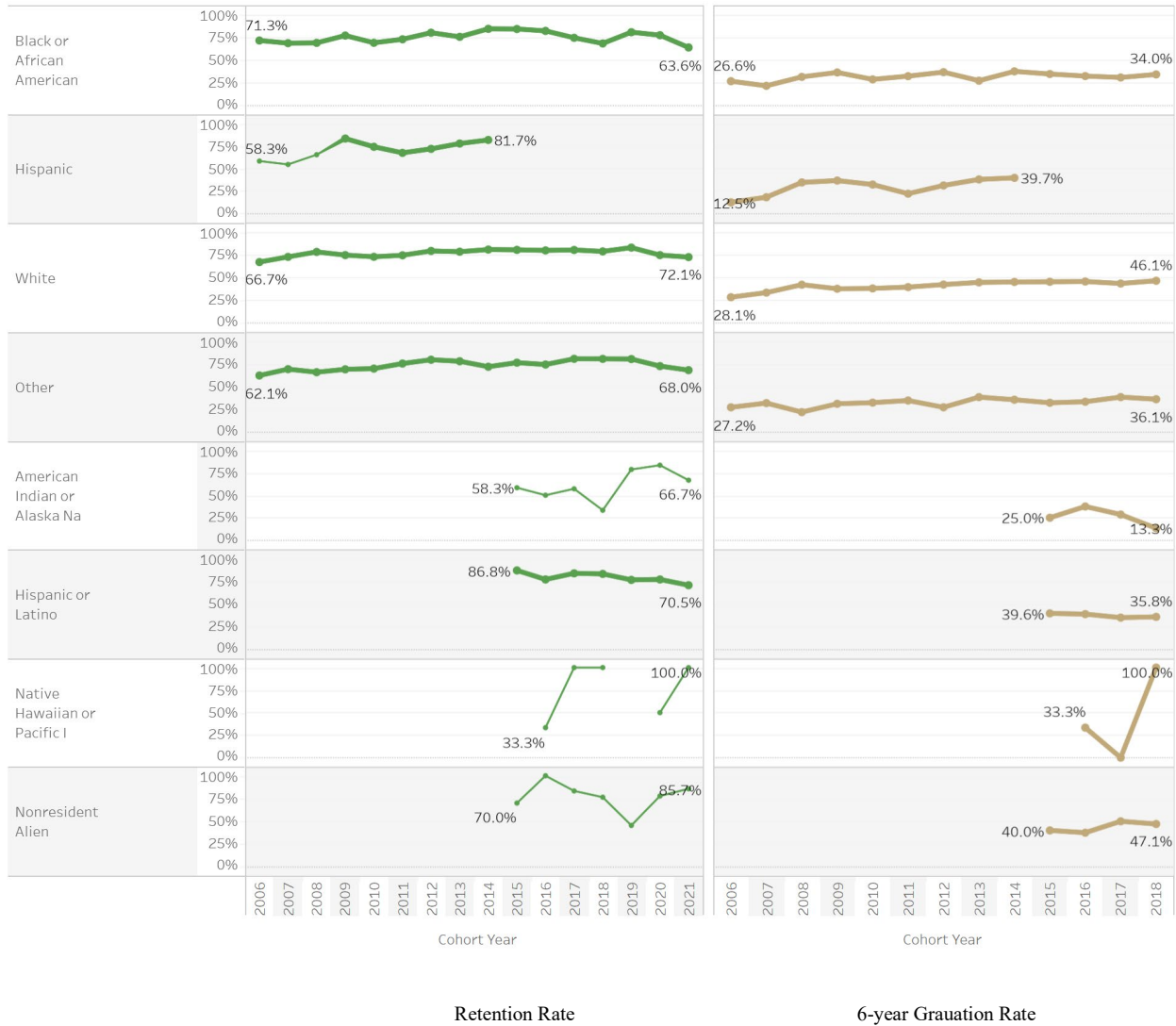
Note: These categories and labels were provided by the data source and align with federal government definitions for reporting to IPEDS. According to federal definitions, all people who report Hispanic or Latino ethnicity are counted as Hispanic or Latino regardless of other race options for which they may self-identify. The data were provided by the source identified, but the visualization was re-created for clarity.

At WCU, these gaps in retention and graduation rates exist, though they are not quite as pronounced as the national disparities. For the most recent years available, white students had a first-year retention rate that was 8.5 percentage points higher than African American students, and a 4-year graduation rate that was 12.1 percentage points higher than African American students (see Figure 5). Similarly, white students had a first-year retention rate that was 1.6 percentage points higher than Latinx students, and a 4-year graduation rate that was 10.3 percentage points higher than Latinx students (see Figure 5). These numbers can be a little challenging to understand without a more thorough review, because they are taken at different points in the academic career (with key data collections points at the

one-year mark for retention, and the four- and six-year marks for graduation). This means that when examining the most recent data, the user is likely comparing two or three different incoming classes (the class that started last year for retention, four years ago for 4-year graduation, and so on).

Figure 5

First-Year Retention Rate and 4-Year Graduation Rate of Freshmen by Race/Ethnicity



(Western Carolina University, Retention, Graduation, and Persistence, 2022)

Overall, the number of African American and Latinx students is relatively low. Because of the smaller population size, small changes in enrollment can result in large differences in outcome measures. For example, a change in the student success outcome of seven African American students who started in

Fall of 2021 would impact the retention/graduation rate by 1% for that group. The same change of 1% for the white population would require a change of 89 students (Western Carolina University, Student Enrollment, 2022). For this reason, the retention and graduation rates tend to fluctuate more for smaller populations, including African American and Latinx students.

Institutional data about academic outcomes, like retention and graduation, for students with documented disabilities are not published at WCU. It is likely though that an equity gap exists for these students. While national data about academic performance of students with documented disabilities are also lacking, research based on smaller samples does provide a basis for this inference. Institution-level research into this question demonstrates that differences in academic outcomes between students with disabilities and their non-disabled counterparts do exist, and that the intersectionality of other factors like race/ethnicity, income level, and/or parental education, can play an additional role in disparate retention and graduation rates (Safer et al., 2020). National data are available for high school completion rates and point to a similar pattern. Among 18- to 24-year-olds, there was a nearly 9-point gap in high school completion status between those with and without a disability at “84.8 vs. 93.6 percent” (U.S. Department of Education, 2019, p. 29). However, the literature also contains findings that quality programming and intervention strategies can reduce or eliminate this gap (Markle et al., 2017; Wessel et al., 2009). The fact that local comparisons of success outcomes between students with and without disabilities do not exist is problematic. This missing reporting element, along with literature suggesting that disparate outcomes can be mitigated with quality intervention strategies, suggests that an examination of student success data for students with disabilities at WCU, compared with their non-disabled counterparts, could provide a great deal of value in working on enhancing equity for students across this demographic group.

While WCU has been focused on developing a new data and reporting environment, the number and level of reports available is not yet sufficient to support departments/units that serve marginalized populations. The current reports available largely focus on enrollment counts, high-level data by demographic categories, and student success outcomes by those same high-level population groups. There is some reporting that focuses on academic departments, like credit hour production and

enrollment, but very few reports that focus on support units, especially those that support marginalized student populations. In general, reporting on academics and finances has been prioritized, and reporting on student life lags behind, especially in terms of ground-level data for relatively small departments.

There are funding opportunities available, through internal and external processes, namely an annual university budget request cycle as well as external grant funding opportunities. Across the board, these are highly competitive processes, as the need for funding always exceeds the resources available for allocation. When small units that support marginalized populations submit funding proposals, they can find it challenging to successfully compete for scarce resources, when vying against larger units with more robust experience in the budget process. This is partly because they lack the information about their service populations and program outcomes, which could help strengthen their funding applications. The heart of this disquisition centers on empowering units that serve marginalized populations with information and skills to successfully access and use data to tell the story of their work and impact, and ultimately to garner additional resources using this information.

Speaking with directors of these units during the initial phase of my problem of practice and disquisition idea development, I was struck time and again hearing them talk about how data were key resources to which they needed access. The data, data tools, and reporting environment currently exists, and can be utilized to support these units in their data exploration and narrative development. What is lacking is a focus on these groups in the data development and reporting process. There are many competing data priorities, and insufficient personnel to address all needed data. I selected this disquisition topic because the data, tools, and structure largely already existed, and what was needed was time and expertise, which I was able to offer, given my access, organizational position, and professional background. This is an example of the Improvement Science technique that involves finding the specific components of a problem that are possible, ripe, and present an opportunity for leverage and improvement, and then focusing on those specific causal elements (Bryk et al., 2017).

Theory of Improvement

Data are becoming one of the most important commodities in higher education (McNair et al., 2020). Data access can be a serious issue on college campuses, and data analysis and use can be even more challenging to obtain. Even for a mid-sized institution like WCU, a tremendous amount of data are generated each year. Officially, frozen census data is collected on every element of applications, course offerings, student demographics, program enrollment, course enrollment, personnel, graduation, facilities, financial aid, finances, etc. In addition, data are stored in complex on-site and off-site software systems across the enterprise, from the student information system (often Banner or PeopleSoft) to the learning management system (often Blackboard or Canvas), specialized systems used for advising, advancement, survey administration, energy usage, facilities scheduling and reservations, personnel evaluations, purchasing, libraries, work orders and warehousing; the list goes on and on. While institutions are spending more than ever managing, storing, and using data, the analysis they provide is often just a drop in the bucket compared to what is possible, with demand constantly outstripping supply of data analysts' time and talent (McNair et al., 2020). The use of data for promoting equity goals is particularly underexplored (Dowd & Bensimon, 2015).

Access to data and the ability to use them to provide compelling narratives can make a difference when departments compete for scarce resources in the tightening budget environment higher education is experiencing. Data access can differentiate “haves” and “have nots,” like other scarce and valuable resources (Capper, 2019). Data in the higher education setting are especially valuable when they are close-to-practice, meaning closely related to the department or organization utilizing them (McNair et al., 2020). For example, the Office of Intercultural Affairs, which serves many African American and Latinx students at WCU, is better served with information about the students that participate in their programs specifically, rather than only having more generic population-level data about all African American and Latinx students at the institution. This kind of close-to-practice data empowers units to be more competitive in internal and external funding opportunities. Additionally, this kind of information is useful in strategic decisions about where to spend the existing budget (does it make a greater impact to

spend more on program A or program B?), as well as assessment and continuous improvement efforts. Finally, this information is very valuable when communicating with stakeholders, such as current students, prospective students and their parents, administrators, accreditors, alumni, and donors.

Access to data and the ability to utilize data can increase the power differential of a particular department. Critical Theory Epistemology encourages both the disruption of power, through the illumination of who has access to resources and who does not, and empowerment of those who have been historically oppressed within the system (Capper, 2019). While the institution has been focused on overall enrollment and financial reporting, for example, that is only a reflection of the local values and priorities. If institutional leadership instead prioritized equity in student outcomes, for example, reporting on the experience of students from marginalized backgrounds, including the success of programming to support them, would become critical to the mission. Critical Theory Epistemology directs us to question the structures, priorities, and other elements of the “taken-for-granted status quo” and envision a different arrangement where the goal of equitable student outcomes becomes supreme (Capper, 2019, p. 71; Capper et al., 2020).

Theory of Improvement - My theory of improvement focused on WCU departments that support historically marginalized students. I theorized that increased access to program-level data, and capacity to utilize this information, would lead to improved ability, within these units, to (1) advocate for resources, (2) engage in data-informed departments planning, and (3) communicate with stakeholders.

Reinforcing themes in the literature (Dowd & Bensimon, 2015; Dowd et al., 2018; McNair et al., 2020), which point to close-to-practice data as key departmental resources, directors of DEI-supporting units at WCU, confirmed that lacking data access and data analysis skills is a hinderance to understanding and articulating the full impact of the services offered by their departments. In a data rich environment, these directors are reporting that increased access to actionable data, and the associated skills to interpret and use that data, would support departmental decision-making and resource solicitation. The directors of both Intercultural Affairs and the Office of Accessibility Resources helped construct and review the

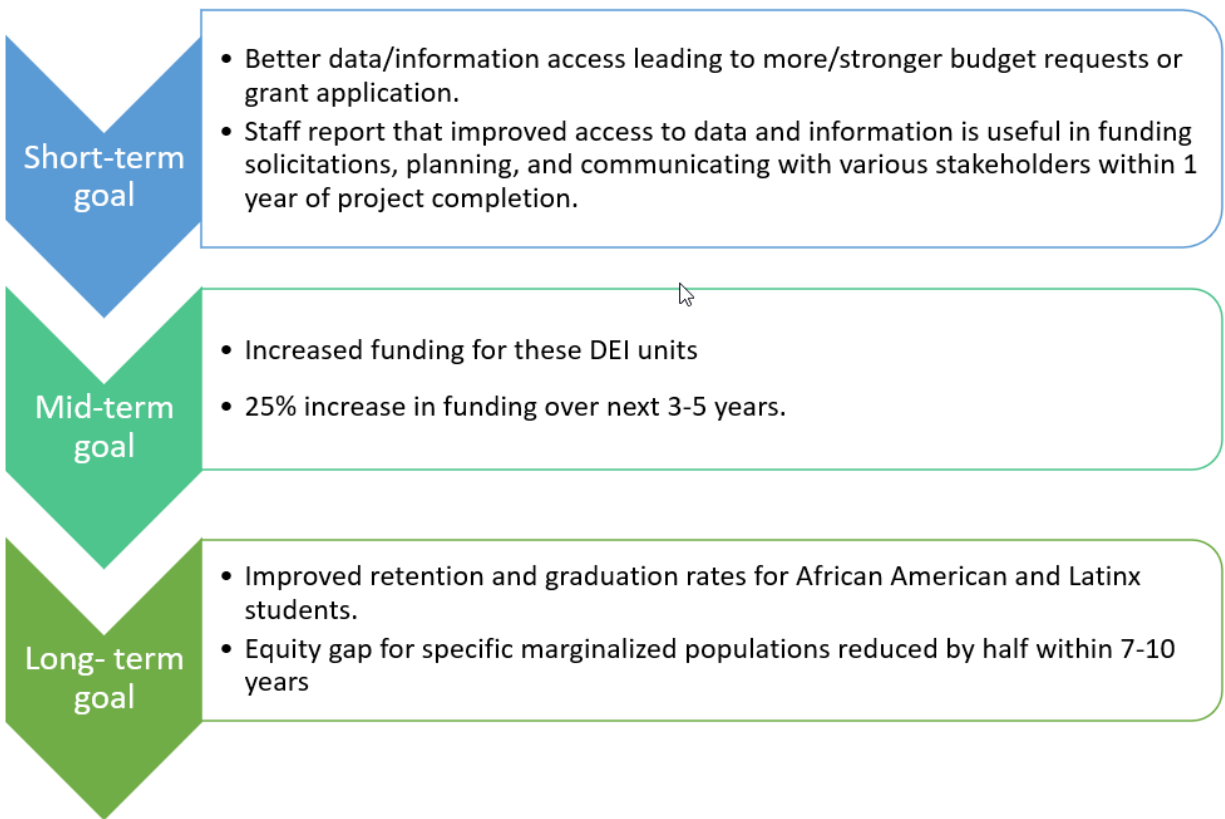
causal analysis fishbone diagram (Figure 2), collaborating on the root cause analysis of the data inaccessibility problem.

SMART Goals

The goals of this project were related to short-term data access and usage, mid-term improvement in budget prospects, and long-term improvement in student outcomes. These S.M.A.R.T. goals (specific, measurable, attainable, realistic, and time-bound) are listed in Figure 6 below.

Figure 6

S.M.A.R.T. Goals



In the short-term, with this project, I aimed to empower departments that serve marginalized student populations with data and information. Within one year of the project completion (meaning delivery of reports and training, as further outlined in the next section), the intention was that 80% of the staff in those units would report that this increased access and analysis skill was useful in departmental

planning. Additionally, within that same one-year period, the staff in those areas would report that they are better able to communicate to stakeholders about the number and characteristics of the students they serve and the impact of their programming on those students. In the short-term, there was an additional goal identified of improving funding prospects. Within one year of project completion, the aim was that staff would report increased funding activity, meaning that the dollar amount of fiscal resources sought, internally or externally, would have increased, and/or that the quality of funding applications would have improved with the inclusion of data about the population served and service impact.

S.M.A.R.T goals for this improvement project were also outlined for the mid- and long-term, as delineated in Figure 6. The mid-term goal focused on increased funding. Within the next 3-5 years the project was anticipated to impact the actual funding received by those units serving marginalized student populations, which benefited from this increased data access and training. The goal therefore was that increased funding activity in the short-term (number of funding requested increased, amount requested increased, and/or quality of funding requests improved) would result in an overall funding increase to those units by 25% within a 3- to 5-year window.

Even more long-term, the project is anticipated to impact the success outcomes of marginalized student populations. As additional funding is anticipated in the mid-term, increased staffing, additional programming and/or better funded and higher quality programming (that would result from increased budgets) is expected to improve outcomes for the populations of students served by those units. Long-term, the goal of the project is that retention and graduation rates for the impacted student populations (primarily African American and Latinx students) would improve, and that the existing equity gap between those populations and the population achieving the highest success in retention and graduation would be reduced by half within a seven-to-10-year period.

Of course, it is impossible to know at this point whether the mid- and long-term goals will be met in the timeframes identified. However, just as formative goals within the context of an improvement project help a scholar-practitioner evaluate during the process whether the project is on-track to meet the

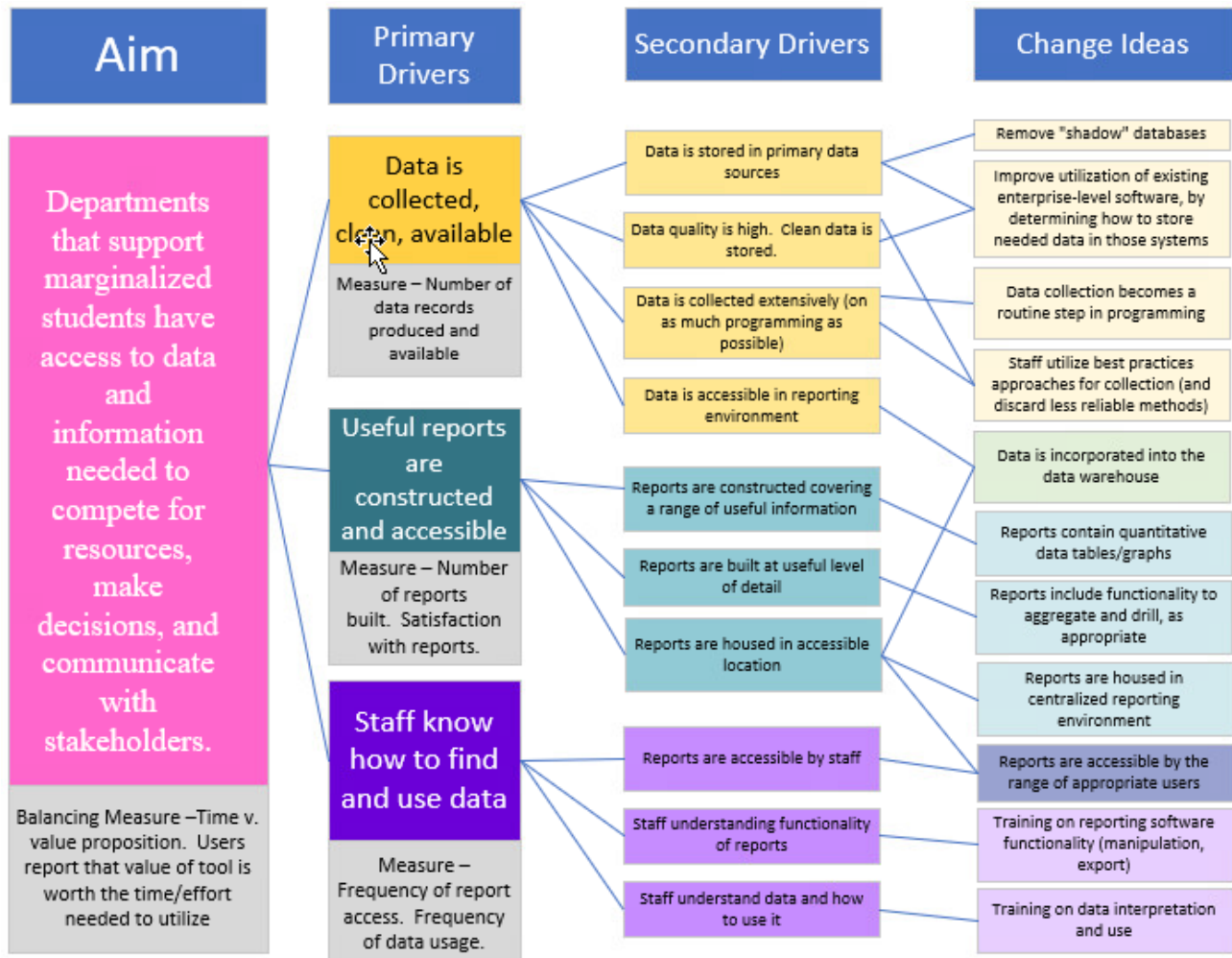
outcome goals, short-term goal evaluation similarly gives an early indication as to whether mid- and long-term goals are likely to be met.

Driver Diagram

One of the hallmark tools of Improvement Science is a driver diagram. This sort of mapping helps break an aim into contributing or component pieces, delineating all the various elements that could contribute toward that goal (Bryk et al., 2017). This enables a scholar-practitioner to view a variety of components or contributors to the aim, and then strategically choose which elements to address in which order. The diagram itself connects the aim with several primary drivers, or factors/contributors. These primary drivers can be broad themes, so they are often broken down further into secondary drivers, where the ideas are fleshed out in greater detail. Finally, the model includes change ideas, which are directly linked to one or more secondary drivers. These change ideas are actual projects, plans, or action items that the scholar-practitioner may consider implementing. For some aims and projects, the researcher may only select one change idea to implement. For other projects, several or many may be tried. The number of change ideas attempted will depend on the length of the project, commitment, time, other resources allocated, and feasibility of the various ideas. Mapping the drivers and change ideas in this way allows the scholar-practitioner to expand their vision of the various approaches that could contribute toward the goal and select the one or several that have high leverage. Leverage is determined by ease of implementation compared with relative impact of the change idea (Hinnant-Crawford, 2020). Ease of implementation may be related to the scholar-practitioner's span of control or influence, the resources required, such as money or personnel, and/or alignment with organizational culture. Impact is an evaluation of how much improvement is likely to result from the implementation of the intervention. The best improvement ideas to pursue (i.e., those with the most leverage) are those with high impact and high ease of implementation (Hinnant-Crawford, 2020, p. 130-31). Figure 7 below provides the driver diagram that was developed as the basis of this disquisition project with the full range of primary and secondary drivers and associated change ideas.

Figure 7

Driver Diagram



In this diagram, the short-term aim was captured. Departments that support marginalized student populations, in this case specifically African American and Latinx students in the ICA’s Project C.A.R.E. program, would have access to data and information that helps them compete for resources, make decisions, and communicate with stakeholders. Project C.A.R.E. (an acronym for Culturally Aligned Retention Enhancement) is an intensive year-long program offered through the ICA, which includes a variety of events and experiences, the most significant of which is a mentorship program where upperclassman are paired with incoming students. This program seeks to provide a welcoming transition and support community for new students, particularly African American and Latinx students, as they

enter WCU, a predominantly white institution (PWI), increasing the sense of belonging, and ultimately aiming to increase the success of these students. This goal was selected because of its ability to (1) empower those who have been historically marginalized at WCU, (2) unite the values of the institution with the facts of support provided to units that engage in actualizing those purported values, and (3) disrupt the entrenched power differential that occurs between those who have access to data resources and those who do not (Capper, 2019).

There are three primary drivers described that contribute to this goal: collection and availability of clean data, reporting that is useful and accessible, and staff knowledge about how to access and use the tools. Each primary driver is then mapped into secondary drivers and associated change ideas. The first driver about clean, collected, and accessible data is further mapped into secondary drivers where the focus is on data storage, quality, accessibility, and scope. Change ideas include capturing more data by incorporating data collection as a routine step in programming. In other words, when these units offer programming or services, how do they incorporate capturing participant IDs into the programming or service efforts? It also suggests moving away from less reliable collection methods (e.g., having students hand-write their ID number on a piece of paper) in favor of more reliable methods (e.g., swiping a student ID card upon program entry). Other suggestions include moving away from “shadow” databases, such as Excel files stored locally on a staff person’s computer, and instead utilizing existing enterprise-level software applications, such as Banner or Engage (software about student life event registration, clubs, and student organizations.)

The second primary driver was about the construction and accessibility of useful reports. Secondary drivers include construction of reports that cover a range of useful information. Many departments lack reporting all together. In other cases, departments have reports, but they do not provide information in a way that is useful. A focus on creating reports that directly serve the needs of the Office of Intercultural Affairs was critical. Similarly reports need to be built at a useful level. A change idea associated with that driver was to build reports that could be viewed at a summary/aggregate level for reporting high-level statistics, and that provide the user the functionality to drill down into more fine-

grain data. Finally, to satisfy this primary driver, there was a secondary driver related to where the reports were located. Reports needed to be offered from an accessible location. The change ideas included storing reports in a centralized report repository and ensuring that reports were accessible to the range of appropriate users.

The final primary driver was ensuring that staff knew how to find and use the reports. This includes a secondary driver related to report accessibility (where the change ideas overlap slightly with 2nd primary driver of accessible and useful reports constructed). This also included a secondary driver about staff understanding of report functionality, which is tied to training on the software systems employed (including elements like report filtering and data export). Finally, this primary driver contained a secondary driver about staff understanding of the data provided and how to use them. The change idea for this component was training related to data use and interpretation.

Improvement Initiative Design

Defining the problem itself, and creating intervention strategies, required the collaboration of the scholar-practitioner with a design team and other stakeholders. One of the hallmarks of Improvement Science is the user-centered lens through which problems are examined and intervention strategies are developed. User-centered means that those closest to the problem are key consultants throughout the process, and that the problem is not defined as being based on the users themselves (i.e., deficit-based perspective) but rather focuses on the system that causes or reinforces the problem for those stakeholders (Hinnant-Crawford, 2020).

In Improvement Science, relevance is one of the key indicators of quality and rigor (Gutierrez & Penuel, 2014). Scholar-practitioners are not researchers who sit in offices by themselves, creating theoretical work to be published and read only by other scholars. Scholar-practitioners are individuals who have been formally trained to systematically use scholarship tools, in the direct and applied day-to-day engagement and practice within organizations. The work is meant to be highly realistic, both in terms of defining problems, and creating workable and actionable change strategies. To most clearly

understand organizational problems and create realistic and achievable solutions as the scholar-practitioner, I needed to be positioned close to the action, engaging directly with those nearest to the problem. For this reason, an early task in this Improvement Science work was the establishment of a Design Team.

Design Team

The Design Team for this project offered a range of very significant skills and perspectives. Ensuring that the problem was defined by a team of knowledgeable, close-to-practice stakeholders, and that the planned improvement initiative was feasible, meaningful, and appropriate, was accomplished through the collaborative effort of the Design Team. This Design Team for this project consisted of:

| Name | Credential | Role |
|---|---------------------------------|--|
| Alison Joseph (Scholar Practitioner) | MPA and Ed.D. in progress | I am the lead Business Intelligence Analyst in Western Carolina University’s Information Technology Division, serving on a team called CATalytics. Prior to serving in that role, I was the Assistant Director for Financial Planning and Analysis in the Budget Office and also served as the senior analyst with the Office of Institutional Research and Planning. I have more than 15 years of experience collecting, cleaning, and analyzing data across the higher education data spectrum, as well as training/consulting about data usage. |
| Dr. Ricardo Nazario-Colon | Ed.D. | As the Chief Diversity Officer at WCU, Dr. Nazario-Colon helped with overall understanding of the problem (related to lack of close-to-practice data to support units serving marginalized students), as well as the design and implementation of viable improvement efforts. Dr. Nazario-Colon is also a recent graduate of the Education Leadership doctoral program at WCU, |

| Name | Credential | Role |
|--------------------|------------|---|
| | | and therefore helped to ensure that the project was designed and implemented appropriately utilizing the Improvement Science framework. |
| Dr. Dana Patterson | Ph.D. | Dr. Patterson was the Director of Intercultural Affairs, the student support organization that runs Project C.A.R.E, the program on which this project ultimately focused. Intercultural Affairs is part of the Student Affairs division at Western Carolina University. ICA serves many different types of students and offers a wide variety of programming around diversity, equity, and inclusion. This unit provides a great deal of direct support and programming for the African American and Latinx student populations at WCU. Dr. Patterson also taught with the Educational Leadership doctoral program at WCU, and that knowledge and experience provided additional value to the Design Team. Towards the end of the project, Dr. Patterson left WCU to become the Chief Diversity Officer at Wingate University. |
| Jadarius Jackson | Ph.D. | Dr. Jadarius (J.D.) Jackson was the Director of the Office of Accessibility Resources (OAR) at WCU, a unit located in the Academic Affairs division. This department serves students with documented disabilities, and helps students and faculty manage academic, testing, and physical accommodations. As a relatively new employee of WCU, he provided a unique perspective on the institution and the group of students that his |

| Name | Credential | Role |
|--------------------|------------|---|
| | | <p>department serves. While the project originally sought to include the OAR in the creation of reports, that plan was changed with the departure of Dr. Jackson from WCU in May 2022, when he left to become the Director of the Office of Learning Resources at the North Carolina School of the Arts.</p> |
| Dr. Amelia Schlott | Ed.D. | <p>Dr. Schlott was the Associate Registrar and brought deep, historic, and significant data access, cleaning, and analysis skills to the Design Team. Dr. Schlott was among the most experienced throughout the entire institution at pulling and analyzing student data. Dr. Schlott was also a recent graduate of the Educational Leadership program at WCU. With this experience she was able to provide guidance and insight into the Improvement Science process, in addition to her vast data skills. Near the end of the project, Dr. Schlott left WCU for a role within the Office of Institutional Research and Enterprise Data Management at the University of North Carolina – Greensboro.</p> |
| Carl Cortright | B.S. | <p>Mr. Cortright is the Data Architect within the Information Technology division at Western Carolina University, and my counterpart on the CATalytics team. Mr. Cortright played a key role in helping implement the data collection, integration, and storage components of this project, as well as offering feedback and insights on data visualizations.</p> |

All members of the Design Team were consulted about the project in advance of the proposal and provided feedback on the problem definition and improvement initiative plan. All members readily

agreed to participate on the Design Team, speaking to their concurrence with the concept that there is room for institutional improvement around the defined problem of practice. The problem definition emerged directly from discussions with the directors who lead units that have a primary function of providing services to marginalized student populations, namely Intercultural Affairs and the Office of Accessibility Resources.

As the lead scholar-practitioner, it was critical for me to bring a hyper-awareness of personal strengths and limitations, as well as positionality, to the Design Team. Work within the higher education sector for over 18 years, and a visible role, engaged with senior leadership in high-level decision-making, has provided me with a great deal of insight about how decisions are made, and how influential data can be in the process. Experience as a practitioner includes a background with data cleaning, handling, and analysis. Additional experience in training end-users, consulting on data projects of all types, and utilizing data for storytelling and agenda-setting, provided me with a strong background as the project lead. Training throughout graduate school, both in the completion of a Master's in Public Affairs degree, as well as the first two years of coursework in the doctoral program for Education Leadership provided me with the needed training and experience to fulfill the scholar role.

I identify as a white, middle-aged, able-bodied, cis-gendered female. I do not, and cannot, completely understand the experience of African American or Latinx students at WCU. Constructing a Design Team, which included colleagues who personally and professionally relate to the experience of these students more closely, because of both their individual identities in marginalized demographic categories and/or their long-term experience working with students in these identity groups, added a level of cultural relevance that cannot be overstated. Engaging with a group of colleagues who have diverse identity backgrounds, as represented in the Design Team, ensured that diverse perspectives were considered during the problem definition, and the design and implementation of the improvement initiative. Design Team members also provided perspectives that covered a range of those working in different roles, different departments/divisions, and with different goals, priorities, skills, and abilities. Working with this group helped me understand what different stakeholders hoped to gain from this

process and how to make the output as meaningful as possible for different groups relative to the stories they hoped to convey about their programs.

Improvement Initiative

To address the aim of this project (i.e., departments that support marginalized students have access to data and information needed to compete for resources, make decisions, and communicate with stakeholders), the following improvement initiative was implemented:

Improvement Initiative - The Design Team developed and built quantitative and qualitative reports and tools, and through appropriate consultation, ensured that staff in the Office of Intercultural Affairs, which serves diverse and marginalized African American and Latinx student populations through the Project C.A.R.E. program, could utilize these tools in resource advocacy, departmental planning, and communicating with stakeholders.

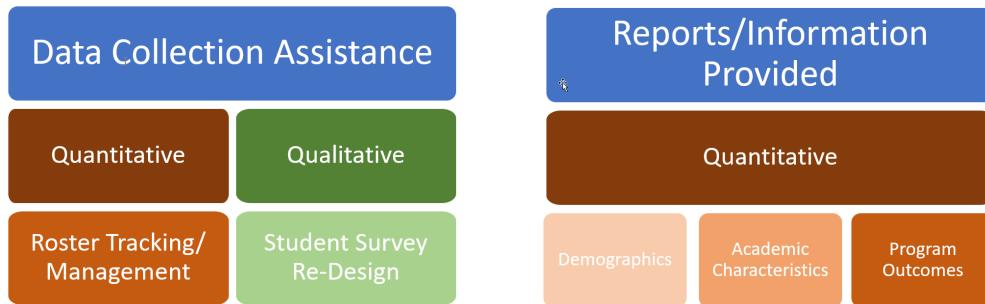
Data Collection Assistance

Two distinct activities were undertaken with the ICA toward this end: namely, data collection assistance and the development of quantitative data reports (see Figure 8). First, the ICA received data collection assistance in two primary forms. For many years, the ICA had been running the Project C.A.R.E. program and tracking student participants. These student rosters were stored locally by staff members in Excel spreadsheets. The Design Team identified a number of ways that that process could be improved (as outlined in the driver diagram), and so this was determined to be the first step in the project implementation. Several specific improvement opportunities were conducted. First, past rosters were cleaned, meaning we undertook a collaborative process of correcting student identification numbers that were incorrectly listed on rosters from prior years, where possible. Second, we located a place in Banner (WCU's student information system and primary system of record for campus operations) where Project C.A.R.E. rosters could be stored. Third, rosters from prior years were loaded into Banner. And finally,

we developed a process with ICA where rosters for subsequent years would be loaded directly into Banner each fall as soon as the Project C.A.R.E. program got underway.

Figure 8

Data Collection Assistance and Reports/Information Provided



The second part of the project related to data collection assistance was revision of the student survey instrument. The ICA has collected student survey data for a few years, most recently utilizing the online survey tool Qualtrics. In consultation with the Design Team, it was determined that the student survey instrument presented an opportunity for data collection improvement. See Appendix A for the former version of the ICA student survey instrument, and Appendix B for the revised version.

The revised survey instrument, which was constructed by me and the Interim ICA Director Evelyn Rucker (with input from former ICA Director Dr. Dana Patterson), accomplished a number of goals. First, the instrument that the ICA had been using previously had been utilized with both Project C.A.R.E. students and members of the African American Alumni Association. Because it was serving two purposes, the questions didn't all apply to either group, which made for a somewhat confusing and clunky user experience. When we redesigned the survey, it was built specifically to elicit feedback from Project C.A.R.E. students at the end of the yearly program. We decided that if the alumni group needed to be surveyed again in the future, it would be accomplished through a survey instrument tailored for that specific purpose. Clarification of both the intended survey group and the timing of when the instrument would be used, allowed for more specific and relevant questions, garnering the ICA more meaningful and actionable data. The revision included more detailed questions about the participant experience, and the

extent to which the program impacted students in a variety of facets, such as social integration, academic support, and leadership development. A new question on the survey asked students to provide their level of satisfaction with different components of Project C.A.R.E., such as the retreat, mentorship program, special events, and engagement with ICA staff. These questions were both meant to help the ICA staff determine which parts of Project C.A.R.E. were working as intended, and which represented improvement opportunities. Both new questions were meant to produce information that would specifically be useful for internal departmental planning. Another improvement to the survey design was the implementation of skip logic within the software, so questions could conditionally be shown based on answers to prior questions. For example, if a participant indicated that they did not consistently participate in the mentorship program for the duration of the year, an extra question would be displayed asking the reason that the mentor relationship didn't work out as intended. The addition of this skip functionality improved the user experience and the quality of data collected.

There was another important change implemented with the student survey that only partially worked. In consultation with the ICA, it was decided that instead of collecting completely anonymous survey responses, as was done in the past, that tying the survey data to a student identifier would be beneficial. The rationale for this decision was that, with an included student identifier, survey data could become even more useful when it was tied to demographics, academic indicators, and program outcomes. For example, if there was a consistent pattern that students who rated the program as low with respect to social integration were found to be less likely to retain, that might point to the importance of social belongingness development among the Project C.A.R.E. students as a retention factor. Another example might be if women all rated the program as excellent whereas men rated the program as average. This might indicate that the ICA should recruit more men, create a separate program for men, or in other ways tweak the programming they were delivering to men. Those kinds of insights could be readily available if qualitative data could be linked to quantitative demographic and academic outcome data through the collection of a student identifier on a survey response.

The ICA intended to collect the end-of-year survey with the 2021 Project C.A.R.E. cohort using this new instrument and identified survey response methodology. While the implementation of the new instrument was successfully achieved, only about half of the survey responses were collected with the identifier as intended. This was because the survey was launched correctly originally, but the reminder that was sent to non-respondent students was improperly constructed and anonymous responses were collected accidentally. Since about half of the survey responses were collected without an identifier, it was determined that matching the responses to demographics and outcomes wouldn't be meaningful this cycle. However, even given that small misstep, the qualitative data collection was improved significantly because of the redesign of the instrument as well as building out the new survey in Qualtrics with correct skip logic and other technical detail improvement (that ICA will be able to copy and re-use each year to standardize data collection). I spent a significant amount of time with Interim Director Rucker training on the Qualtrics software, survey design principals, and how to collect data in the future so that it will include a student identifier.

Critical Theory Epistemology speaks to the value of elevating the voices of the oppressed and engaging those most directly impacted by a problem in discussion about the problem as well as potential solutions (Capper et al., 2020). Student surveys are a good strategy for collecting feedback from students in marginalized populations, providing them with an accessible and meaningful opportunity to participate in that organizational conversation. In this case, students from African American and Latinx backgrounds can use the survey instrument to tell institutional leadership about challenges they experience as members of an underrepresented racial/ethnic group at a PWI, and how the ICA and Project C.A.R.E. program provide needed social, cultural, and academic support, as well as other suggestions for improvements that could be made to the department, program, or institution.

Reports and Information Provided

The quantitative reports provided included three primary kinds of information (see Figure 8). The quantitative information, which was collected and provided in an interactive dashboard format constructed using Tableau, incorporated demographics, academic characteristics, and student success

outcomes. The demographic data included a breakdown of the service population by gender, race/ethnicity, residency (in-state/out-of-state), student type (freshman/transfer), and full-time/part-time. Academic characteristics provided information about the weighted and unweighted high school GPA of students served by the program, along with composite ACT and SAT scores, and component ACT scores. This information is all provided with a reference comparison to all other incoming freshman. Providing this information, particularly alongside the comparison to other students, offers critical context for analyzing and understanding student success data, which is the final quantitative data category. The success data provided included the one-year retention rate, first year cumulative GPA, two-year retention rate and second year cumulative GPA, four-year graduation rate, six-year graduate on rate, and cumulative GPA at graduation. This final data category of success outcomes is particularly relevant for immersive and/or long-term programming/service utilization (e.g., a mentorship program that lasted a year, as opposed for a 2-hour training session), which made it ideal for using with Project C.A.R.E program. While lacking the precision of full double-blind experimentation design, the purpose is to expose differences in student outcomes that could reasonably be attributed in whole or part to participation in the program. See Appendix C for screen captures of dashboard reports.

Utilizing quantitative student success data (which is suggestive, but not conclusive, regarding the impact of the programming on student success outcomes) alongside data collected from surveys, where students describe in their own words the perceived personal impact and/or satisfaction with the programming, has the potential to strengthen the research findings. Drawing together data from multiple sources has the potential to help bolster a claim (in this case, that the programming provided by the ICA through Project C.A.R.E. provides direct value to students and ultimately improves student outcomes). Depending on the data, it does also have the potential to expose problems with the claim, which could help lead further investigation (e.g., some programming appears to improve outcomes, but other programming has no effect) (Miles et al., 2020, 293-6).

Uniting organizational facts with values is a key element of the Critical Theory Epistemology. WCU routinely articulates goals around the value of diversity as well as the commitment to student

success, most commonly measured by retention and graduation rates. These goals are both espoused in the University's Strategic Plan (Western Carolina University, Quick Facts, 2022). The reports provided illuminate diversity both in Project C.A.R.E. and compared with the University more generally. The reports also provide clear evidence of student success outcomes, including the retention and graduation outcomes that the senior leadership are most concerned with, for Project C.A.R.E. students and those not participating in the program, as a point of reference. This exercise unites the values of the institution with quantitative facts about organizational performance in alignment with the framework provided by Critical Theory Epistemology (Capper, 2019).

Implementation Activities and Timeline

One of the cornerstones of Improvement Science is iterative learning, which takes place through deliberate cycles of planning, implementation, reflection, and then the recursive application of knowledge to future processes or cycles. This cyclical, iterative approach is called the PDSA Cycle (an acronym for Plan-Do-Study-Act) (Hinnant-Crawford, 2020). To maximize the potential for learning and process improvement through the collectively gained experience of a design team, an implementation timeline can be established in advance. This timeline can break down the project into discrete tasks, distribute the tasks across time, and perhaps most importantly, build in time for assessment of the process itself, as well as the project outcomes. See Figure 9 for a detailed timeline including process steps, and formative and summative assessment tasks. Figure 10 following the timeline provides the driver diagram with additional information about formative and summative evaluation measurements, including type and collection approach. In this context, formative assessment is evaluation of the process while summative evaluation is assessment of the outcomes (i.e., whether staff in the ICA reported that they had the information needed to effectively advocate for resources, conduct internal planning, and communicate with stakeholder groups).

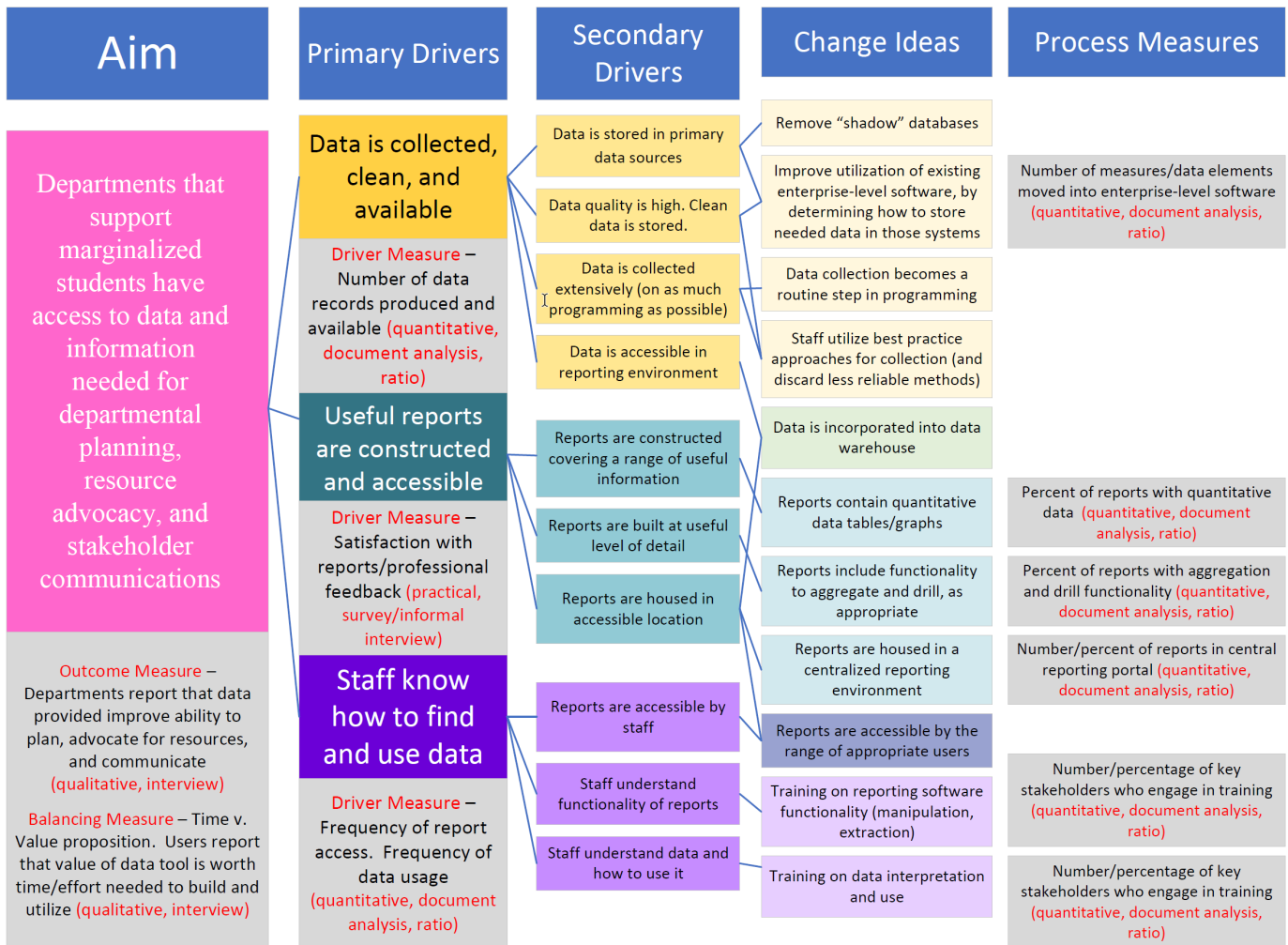
Figure 9

Initiative Timeline

| | Jan. 22 | Feb. 22 | Mar. 22 | April 22 | May 22 | June 22 | July 22 | Aug. 22 | Sept. 22 | Oct. 22 | |
|---|---------|---------|---------|----------|--------|---------|---------|---------|----------|---------|---|
| Process Step 1 Developed Design Team; Collaboratively solidified Problem Statement, Causal Analysis, Theory of Improvement | X | X | | | | | | | | | } Spring - Collected data and evaluated/ improved process |
| Process Step 2 Redesigned Student Survey Instrument and Survey Process | | | X | | | | | | | | |
| Process Step 3 Collection of Historic Data. Data Collection Process Evaluated and Improved | | | X | X | | | | | | | |
| Process Step 4 Additional Data Collection and Consolidation (Data Source Building) | | | | X | X | | | | | | |
| Formative Assessment of Step 3 & 4 Assessment of Improvement Process | | | | X | | | | | | | } Summer - Constructed and delivered quantitative reports |
| Process Step 5 Quantitative Dashboard Development | | | | X | X | X | | | | | |
| Formative Assessment of Step 5 Assessment of Improvement Process | | | | | | | X | | | | } Fall - Provided training and assessed the impact |
| Process Step 6 Final Quantitative Reports Delivered | | | | | | | | X | | | |
| Process Step 7 Training/Consultation with Staff in Intercultural Affairs | | | | | | | | | X | | |
| Formative Assessment of Step 6 & 7 Assessment of Improvement Process | | | | | | | | | X | | |
| Post-Initiative Interviews with staff in Intercultural Affairs to measure access, knowledge, and ability to use data for specific purposes. Intermediate Outcome Goal - 80% or more of staff report improved ability to use data for departmental planning, resource advocacy, and stakeholder communication | | | | | | | | | | X | |

Figure 10

Driver Diagram with Formative and Summative Evaluation Measures



There were seven primary process steps to the improvement initiative. First, the design team was assembled and jointly solidified the problem statement, causal analysis, and theory of improvement. This planning phase took place during January and February of 2022.

The second process step involved a redesign of the student survey instrument and modification to the survey data collection process and plan. This step took place in March of 2022. The newly developed survey instrument and survey distribution plan was utilized in the post-year survey with students, which ICA conducted in March and April of 2022, garnering a significant and positive response from students.

Process step three involved the collection and cleaning of historic Project C.A.R.E. rosters dating back to 2011. This phase also included the identification of a place in Banner where this cohort information could be permanently stored. CATalytics staff, led by Mr. Cortright on the Design Team, in conjunction with other technical staff in Information Technology, loaded those clean historic rosters into Banner. Finally, a process was developed with the ICA staff whereby these data could easily be stored each fall from now on. Housing the data in the University's central student information system provides a secure and permanent place for these records, buffers the unit against data loss associated with staff turnover, and allows these data to be easily reported and linked to other data for various purposes as needed. This step took place in March and April of 2022.

Process step four included the collection and linking to additional data elements. This step included the determination of which data elements would be displayed on the dashboard, the source of record for those data elements and how they would be pulled, and ultimately the creation of the unified dataset for use in the construction of the dashboard. This step incorporated requests and ideas from the Design Team and ICA staff about the kinds of demographic, academic, and success variables that would be included. This step took two months to complete between April and May of 2022.

The longest step was process step five that occurred in May, June, and July of 2022 and consisted of the dashboard development for quantitative data. This included significant iterative technical development and consultation. I built the dashboards and engaged with technical and ICA staff in discussing different versions/approaches for display. Important considerations included the kinds of questions ICA staff were attempting to answer with the new data and ultimately the story that they hoped to tell about the program using the new dashboard resource.

In process step six the dashboard for Intercultural Affairs was finalized. This step took place in September 2022. And in the seventh and final process step (step seven), members of the Design Team met with all staff from Intercultural Affairs, along with Associate Vice Chancellor and Dean of Students Dr. BaShaun Smith, to whom that unit reports, to deliver the final reports and provide training and consultation. This training took place in October of 2022. Topics of the training included how to access

the dashboard and potential ways to use it relative to funding requests, departmental planning, and stakeholder communication. The reports include a variety of filtering options, which allow the end user to engage in data exploration, and the group jointly looked at these options together, practicing utilizing the full functionality of the tool.

Formative and Summative Evaluation Plan

Utilizing the Improvement Science framework, a range of formative assessment steps were pre-built into the timeline, as opportunities to evaluate the process itself. This allowed time for reflection and post-hoc assessment of most of the major process steps. This reflects learning from iteration during the process steps and PDSA cycles and finalization of details for plans and strategies. This is especially important since we anticipate that many of these activities will take place again in the future, either as part of the ongoing data and dashboard development for Project C.A.R.E. or for other units, for which a similar data discovery and dashboard development process may take place. Details about the formative evaluation process are provided in the next section.

At the end of the project there was also a planned summative assessment step. The original plan proposal included a pre-initiative survey of the staff in ICA and OAR, assessing their access, knowledge, and comfort with data. The plan then called for utilization of the same survey instrument at the end of the project, approximately eight months later, to evaluate how the project impacted the ability of staff in those offices to access and use data for planning, stakeholder communication, and resource solicitation. The goal was that at the conclusion of the project, 80% of the staff in those offices would report significant improvement in their access, understanding, and ability to utilize data.

Due to significant staff turn-over, especially early in the project with the departure of all of the OAR staff, the scope of the project was curtailed to Project C.A.R.E in the ICA only. This necessitated a change in the project evaluation strategy, since there would only be a maximum of four people who might be able to take the pre- and post-surveys. A decision was made to shift to a qualitative data assessment strategy employing semi-structured interviews with the ICA staff, as well as Dr. Smith, who oversees the unit. During the course of the project, Dr. Dana Patterson left the institution and Ms. Rucker, the assistant

director of the ICA, was promoted to Interim Director. This further limited the pool of respondents, so ultimately three people were interviewed at the conclusion of the project – Dr. BaShaun Smith, Ms. Evelyn Rucker, and Ms. Karin Kimenker, the administrative support associate with ICA.

With a project of this scope and size, there are bound to be challenges. These obstacles may result from the data and/or technology (like the way data are stored, managed, connected to reportable data warehousing locations, and then analyzed and presented). Challenges could also arise from personnel, either those on the team, those that supervise team members or lead divisions, or those on the peripheral of the project. When encountering problems of the technical variety, it's important to consider ethical principles established by the American Educational Research Association (AERA) and conduct research within the bounds of professional competence (Lochmiller & Lester, 2017). Those standards call on the researcher to source additional professional expertise when confronting a situation or issue that exceeds their knowledge or expertise (Lochmiller & Lester, 2017). In this way, the Design Team provided essential support, ensuring that during each step in the process, the plan was executed using the best technical and professional expertise on campus. During the process step for establishing a place in Banner where the Project C.A.R.E. cohort data would be stored, and how to load and maintain that process over time, technical staff, both those on and outside of the Design Team in Information Technology, made significant contributions in the development of the process.

There was some concern about potential resistance to the process from personnel. If resistance to projects of this nature arise from personnel, there are several approaches for managing the conflict, and moving forward with the project. A great deal of change resistance from personnel can be managed through simple education and communication (Kotter & Schlesinger, 2008). The Design Team and I were prepared to address employee-related issues by educating stakeholders about the project, including the rationale for implementation and anticipated outcomes, and communicating frequently about the timeline and progress. If this strategy proved to be insufficient to elicit cooperation, a next approach could include bringing a person or group resistant to the project in to participate. Engagement in design and implementation is another effective strategy for creating buy-in (Kotter & Schlesinger, 2008). Often

a naysayer can turn into a vocal and influential advocate if they can join in the change and become part of the effort. This simple strategy can create real buy-in, using a positive approach, drawing on peoples' instincts to contribute and succeed. It is worth considering that at times people have good reason to resist. Allowing them time and mechanisms for legitimate participation could serve to improve the project itself and potential outcomes, not just quiet the skeptic.

Luckily there was not much resistance encountered during the project. The only real concern among personnel was from the person who supervises the CATalytics team, and it was related to workload and project management. Dan Berk is the Associate CIO and Director of the Applications and Systems Department in the IT Division. He supervises the CATalytics team and, at a high level, is responsible for data acquisition and management and the CATalytics university reporting environment, which houses WCU's library of curated Tableau reports. While he was supportive of the project in concept, he was concerned about the possible time commitment relative to a potentially small impact and small audience, particularly since the CATalytics team currently has a project backlog estimated at approximately nine months. Mr. Berk has since become a notable champion of the project, understanding and promoting the value both for ICA and as a potential model for customer engagement and report development for many groups and functions in the future. More information about the potential future of this project and the support of Mr. Berk and others is outlined later in the section about leadership lessons.

Formative Evaluation of Improvement Methodology

One hallmark of Improvement Science is that measurement is used to track progress throughout the lifespan of the intervention, as a mechanism for determining if individual improvement actions are working, and ultimately contributing to an improvement, and not just a change (Hinnant-Crawford, 2020). To accomplish this, a scholar-practitioner will establish in advance a series of measurement opportunities. These include summative assessment measures about whether the overarching goal was achieved (in this case specifically, whether staff in the ICA report that they have access to data and the ability to use this information for resource seeking, planning, and stakeholder communication). Improvement Science also

utilizes balancing measures, which seek to determine if other parts of the system or process are negatively impacted (i.e., an improvement in one area causes unintentional harm in another area). Perhaps most notably though, Improvement Science is differentiated in its use of formative measures. Formative assessment measures the process itself, which enables the researchers to monitor whether specific change ideas are contributing toward the overall goals in ways that are expected, and how implementation is progressing. These might measure things like the number of people or units engaged, the degree of fidelity in implementation by unit, or the amount or level at which something is accomplished. These formative measures provide early indications as to whether an intervention is likely to work, and opportunities for plan adjustments based on real-time data and assessment. Table 1 outlines the formative driver and process measures that were undertaken throughout this project.

Formative assessment, meaning assessment of the improvement initiative process itself, was built into the process, utilizing standard Improvement Science techniques. The formative assessment plan is superimposed on the overall timeline in Figure 9, and the formative assessment steps are fleshed out with additional details in Table 2. The plan reflects formative assessment steps after five key process steps, namely: the data collection for both legacy Project C.A.R.E. rosters as well as all the demographic, academic characteristics, and success outcome data for students in Project C.A.R.E as well as the comparison group of non-Project C.A.R.E. students (process steps 3 & 4), the report development (process step 5), and the delivery of the report and associated personnel training and consultation (process step 6 & 7).

Table 1

Formative Evaluation Measure Details

| Type of Measure | Improvement Effort /Aim | Type of Data Collected | Frequency/Timing | Analysis Strategy |
|------------------------|--|--|--|--------------------------|
| Driver | Data are collected, clean, and available | Quantitative - Total data points collected, clean, and available | Collected during initial PDSA. Final collection during Formative Assessment 1. May 2022. | Document analysis |

| Type of Measure | Improvement Effort /Aim | Type of Data Collected | Frequency/Timing | Analysis Strategy |
|-----------------|---|---|--|---|
| Driver | Useful reports are constructed and accessible | Qualitative - Feedback from other analysts and initial indication from stakeholders. | Collected informally during the second PDSA cycle from stakeholders and other analysts. August 2022. | Thematic Analysis, Inductive, Case-Oriented |
| Driver | Staff know how to find and use data | Frequency of report access. Frequency of data usage | Collected during data roll-out, training, and initial use phase. October 2022. | Document analysis |
| Process | Improve utilization of existing enterprise-level software, by determining how to store needed data in those systems | Number of measures/data elements moved into enterprise-level software - Project C.A.R.E. Legacy Records - cleaned and loaded into Banner | Collected during initial PDSA. Final collection during Formative Assessment 1. May 2022. | Document analysis |
| Process | Improve utilization of existing enterprise-level software, by determining how to store needed data in those systems | Number of measures/data elements moved into enterprise-level software - Student Records for Project C.A.R.E. and non-Project C.A.R.E. comparison students | Collected during initial PDSA. Final collection during Formative Assessment 1 in May 2022. | Document analysis |
| Process | Improve utilization of existing enterprise-level software, by determining how to store needed data in those systems | Number of measures/data elements moved into enterprise-level software - Number of variables/fields included (like demographic and academic indicators) | Collected during initial PDSA. Final collection during Formative Assessment 1 in May 2022. | Document analysis |
| Process | Reports contain quantitative data tables/graphs | Percent of reports with quantitative data | Collected during second PDSA cycle. August 2022. | Document analysis |
| Process | Reports include functionality to aggregate and drill, as appropriate | Percent of reports with aggregation and drill functionality | Collected during second PDSA cycle. August 2022. | Document analysis |
| Process | Reports are housed in a centralized reporting environment | Number/percent of reports in central reporting portal | Collected during second PDSA cycle. August 2022. | Document analysis |

| Type of Measure | Improvement Effort /Aim | Type of Data Collected | Frequency/Timing | Analysis Strategy |
|-----------------|--|--|---|-------------------|
| Process | Training on reporting software functionality | Number/percentage of key stakeholders who engage in training | Collected at the end of data roll-out, training, and initial use phase. October 2022. | Document analysis |
| Process | Training on data interpretation and use | Number/percentage of key stakeholders who engage in training | Collected at the end of data roll-out, training, and initial use phase. October 2022. | Document analysis |

Table 2

Formative Assessment Timeline

| Assessment | Date | Description |
|--|--------------|--|
| Formative Assessment 1 (following process steps 3 & 4) | May 2022 | <u>Quantitative</u> – <ul style="list-style-type: none"> Number of data records collected, clean, and available (driver) Project C.A.R.E. Legacy Records - cleaned and loaded into Banner (process) Student Records for Project C.A.R.E. and non-Project C.A.R.E. comparison students (process) Number of variables/fields included (like demographic and academic indicators) (process) |
| Formative Assessment 2 (following process step 5) | August 2022 | <u>Practical Measure</u> – <ul style="list-style-type: none"> Professional opinions about dashboard design (informal consultation with other analysts) and initial satisfaction levels of primary stakeholders (driver) <u>Quantitative</u> – <ul style="list-style-type: none"> Number/percent of reports with quantitative data (process) The number/percent of reports with aggregation and drill down functionality (process) The number/percent of reports housed in a central reporting repository (process) |
| Formative Assessment 3 (following process steps 6 & 7) | October 2022 | <u>Quantitative</u> – <ul style="list-style-type: none"> Frequency of report access (driver) Frequency of data usage (driver) The number/percent of key stakeholders that engaged in training on software functionality (process) The number/percent of key stakeholders that engaged in training on data interpretation (process) |

Process and Driver Measures

The first formative assessment took place in May of 2022, following data collection and consisted of assessment of the data collection process for both Project C.A.R.E. legacy roster collection, cleaning, and loading into Banner (process step 3) and the collection and joining of this roster to a dataset with student demographic, academic characteristic, and success outcomes data for all Project C.A.R.E and non-Project C.A.R.E. new undergraduate students (the comparison group) (process step 4).

In this step, the Design Team evaluated both process and driver measures. Process measures included the number of Project C.A.R.E. legacy records that were cleaned and loaded into Banner. These data dated back to fall of 2011. In total, records for 991 former Project C.A.R.E. participants were located, with information about their cohort year and role in the program that year (i.e., mentor or mentee). Additionally, during this phase, records were collected for Project C.A.R.E. participants and non-Project C.A.R.E. participants (who are used as a comparison group). In total 39,989 students were included in the dataset between program participants and comparison students. These are new undergraduate students (freshman and transfers). Forty-seven different fields were included in the final dataset, reflecting information about demographics (like race and gender), student characteristics (like state and county of residence, athlete status, etc.), academic characteristics (such as weighted and unweighted high school GPA, ACT, and SAT scores), and success outcomes (like first year GPA and retention rate, graduation rate, etc.). The total of the number of records collected, clean, and available for use in reporting, which was the driver measure, came to 1,832,483. This quantitative measurement was derived from document analysis, including data tables in Banner and other software systems, and ultimately the Tableau dataset that was produced. See Table 3 for a full table of formative assessment results.

Table 3*Formative Assessment Results*

| Assessment | Subcomponent | Type | Count/Description |
|--|---|---------|---|
| Formative Assessment 1 (following process steps 3 & 4) | Project C.A.R.E. Legacy Records - cleaned and loaded into Banner | Process | 991 |
| | Student Records for Project C.A.R.E. and non-Project C.A.R.E. comparison students | Process | 38,989 |
| | Number of variables/fields included (like demographic and academic indicators) | Process | 47 |
| | Total data points collected, clean, and available | Driver | 1,832,483 |
| Formative Assessment 2 (following process step 5) | Number/percent of reports with quantitative data | Process | All 6 reports (within the dashboard) 100% include quantitative data |
| | Number/percent of reports with aggregation and drill down functionality | Process | 5 of the 6 reports (within the dashboard) 83.3% include aggregation and drill down functionality |
| | Number/percent of reports housed in a central reporting repository | Process | All 6 reports (within the dashboard) 100% housed in a central reporting repository |
| | Feedback from analysts | Driver | Feedback was received from two analysts and incorporated into the visualizations. Additional ideas were received and cataloged for phase two implementation, such as additional filtering (e.g., first-generation status and ASP program participation) as well as additional concepts for incorporating and visualizing student majors/programs of study |
| Formative Assessment 3 (following process steps 6 & 7) | Number/percent of key stakeholders that engaged | Process | 4 key stakeholders engaged (Dr. Sam Miller, Dr. BaShaun Smith, |

| Assessment | Subcomponent | Type | Count/Description |
|------------|--|---------|--|
| | in training on software functionality | | Evelyn Rucker, Karin Kimenker) 100% engagement rate |
| | Number/percent of key stakeholders that engaged in training on data interpretation | Process | 4 key stakeholders engaged (Dr. Sam Miller, Dr. BaShaun Smith, Evelyn Rucker, Karin Kimenker) 100% engagement rate |
| | Frequency of report access | Driver | 1+ times each All stakeholders have accessed the reports one or more times. The data only change once a year, and stakeholders are likely to export a copy of the report's key takeaways, so access frequency is not the best measure |
| | Frequency of data usage | Driver | Unknown. It is unclear how frequently stakeholders have used the reports. |

PDSA Cycle 1 – Data Collection

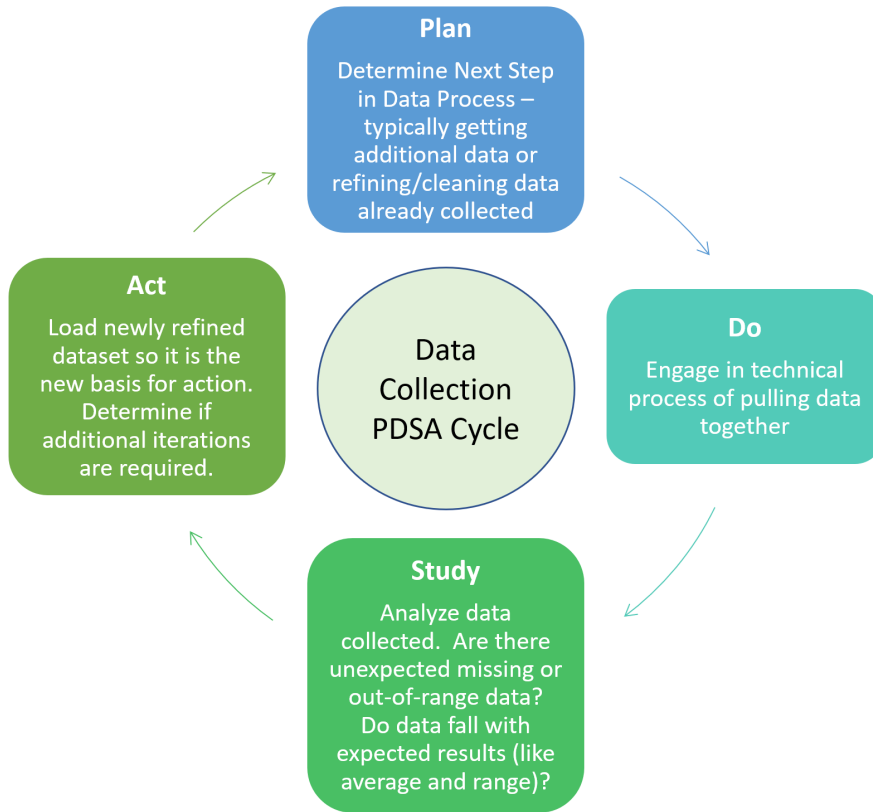
The PDSA Cycle tool was utilized twice during the course of the project, the first occurred during the collection, refinement, and development of the data in Phase I of the formative assessment. Building a dataset of this nature is iterative, and the PDSA tool was therefore an excellent fit for the work (see diagram of this PDSA Cycle in Figure 11). At the beginning of the cycle, during the Plan phase, I worked collaboratively with others on the Design Team to determine the next step in the data collection process. This included plans for adding new elements, refining or cleaning the data, replacing variables with other variables, and so on. During the Do stage next, we engaged in the technical process of pulling the data together as planned. This was mostly done by me, but some was done in part or whole by the other staff member in the CATalytics office, Carl Cortright, who was a member of the Design Team. During the Study phase next, the newly collected data were analyzed. The data were queried to look for unexpected missing values or data out of the expected range. For example, a student could reasonably expect to have

a null SAT score, but it is unexpected to have a missing value for race or gender. In terms of data within range, we would look for unweighted high school GPA values exceeding 4.0, for example. Different techniques were used to view data in this way, including values like field average, minimum, maximum, and/or counts for nominal/categorical data types. Following the Study phase, we would load the newly refined dataset so that it became the new basis for analysis moving forward. At that point, we would determine if we needed to enter another loop of the PDSA cycle, continuing to add, subtract, or refine what was available. When we were satisfied the data covered the range of variables we hoped to use, we closed the PDSA cycle and moved into the second phase of formative assessment.

Critical Theory Epistemology informed the decisions that took place in the first PDSA cycle, specifically in terms of what data were collected for use in reporting. Capper (2019) encourages scholar-practitioners to “make increased student learning and achievement the primary goal of their work” (p. 74). This guidance aligns with the use of student retention and graduation data as a primary focus of the data and the reports that were subsequently developed in PDSA Cycle 2. Capper (2019) also urges a focus on the “range of student differences and their intersections” (p. 74). This guidance supported the inclusion of a variety of demographic variables, such as race/ethnicity, gender, and residency. In the future, additional variables such as income level or ability status could be added to further improve the ability to view student outcome data with a more comprehensive consideration of the importance of intersectional identities.

Figure 11

PDSA Cycle 1 Diagram – Data Collection



The second formative assessment phase was conducted in June of 2022, following the creation of the quantitative reports. This process step was assessed using two approaches. First, there were quantitative measurements related to process steps identified in the driver diagram. These were the number/percent of reports that displayed quantitative data – the kind of data that departments specifically identified as lacking. All six reports (100%) contained quantitative data. We also looked at the number and percent of reports with aggregation and drill down functionality. These elements represent interactivity, and the capability of reports to be used for departmental data exploration. Five of the six reports (or 83.3%) included aggregation and drill down functionality. Using drill down capabilities, end-users have the ability to select specific date ranges, and filter for race/ethnicity and/or gender, as well as student type (freshman/transfer), enrollment intensity (full-time/part-time), and Project C.A.R.E. role (mentee/mentor), where applicable. Finally, there was a quantitative process measure around the

number/percent of reports that were housed in a centralized reporting environment. One hundred percent of the reports provided (all six) were published as a packaged dashboard using Tableau in the CATalytics portal.

One of the most important measures and outcomes of the project was incorporation of these reports into the centralized CATalytics repository. I could have developed a one-off Tableau report and emailed it to end-users in a Tableau packaged workbook. This would have allowed the same functionality in the short-term, as far as the ability to view aggregate and filtered data. But it would not be set up in a manner that supports long-term maintenance and usage. Getting this report incorporated into the centralized CATalytics reporting environment required me to convince several people about the value of this project over the long-run, and obtain permission, buy-in, and assistance. The benefits though were more than worth the effort. Now that the report is in the CATalytics environment, end-users can access the report from the Internet, and require no specialized software to view the data. It is easy for the CATalytics team to extend access to new users. Files do not need to be shared by email. And perhaps most importantly, the data model will allow automatic refresh and publishing of the data each year. Users can access the data whenever and wherever they like, including seeing new data as they are published, and even creating email subscriptions to have PDF reports emailed to them automatically, if they so choose. While this step required significant effort and collaboration, it truly ensures that this becomes a report available to the ICA for many years to come.

In addition to the quantitative process measures, the second formative assessment phase included a practical measure of feedback from analysts and stakeholders. This was done to satisfy the driver goal that useful reports were constructed and accessible. This measurement was based on informal feedback through conversation, across the duration of the report development. This feedback was used to inform the second PDSA cycle utilized during the report development activity.

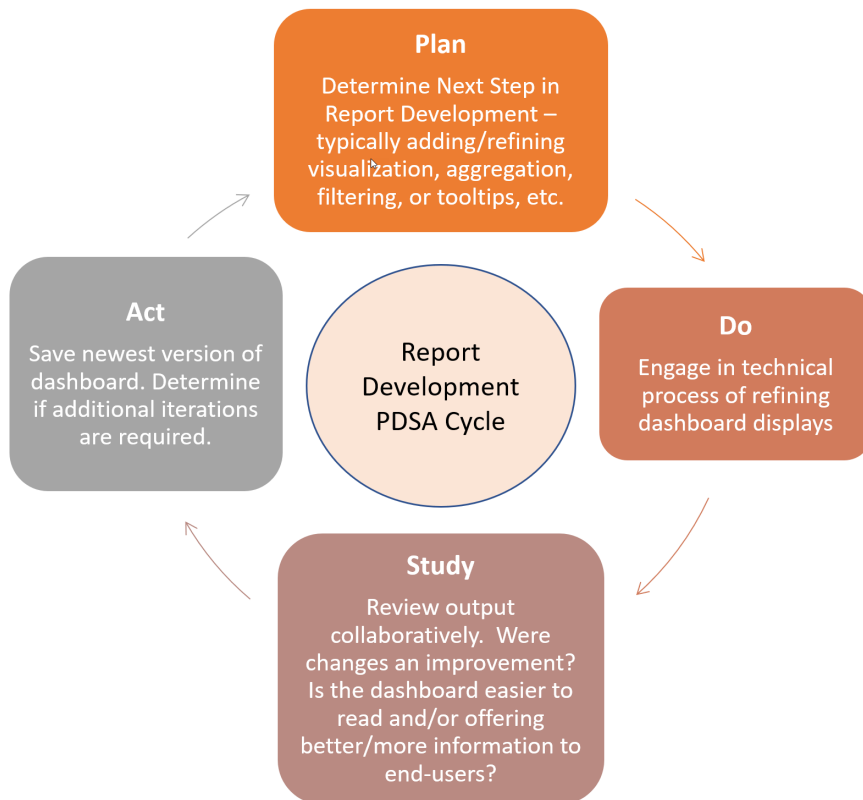
PDSA Cycle 2 – Report Development

The development of reports, like the ones produced for Project C.A.R.E., is iterative in nature, making this step ideal for utilization for the cyclical development approach provided with the PDSA

framework (see diagram of this PDSA Cycle in Figure 12). Initial drafts of the reports were shared with colleagues experienced with data analysis and reporting. Feedback and suggestions were collected, and where possible these improvements were incorporated into more refined versions, until the reports were finalized.

Figure 12

PDSA Cycle 2 Diagram – Report Development



During the Plan Phase of PDSA Cycle 2, ideas and concepts were proposed and fleshed out. These included the development of additional visualizations or refinement of visualizations, filters, and functionality. During the Do Phase, I would engage in the technical process of developing the visualizations and/or refining the dashboard displays. During the Study phase, changes would be assessed collaboratively, typically with the input of one or two other analysts and/or by collecting feedback about the direction we were heading from stakeholders. We would discuss whether changes resulted in an improvement to the usability and/or aesthetics of the dashboard. Questions included: “Is

the dashboard easier to read or interpret?”, “Does it offer more and/or better information?”, “Is it more visually appealing?”, and “Does it provide the information needed to answer questions that end-users will ask?”. Once these questions were satisfactorily answered, the newest version of the dashboard would be saved, committed to the repository, and the team would determine if additional iterations were needed. If so, the process started again, with planning for the next developments in the Plan stage. The CATalytics team uses a cyclical PDSA-type cycle during dashboard development and refinement, always keeping track of various improvements we plan to make to future versions/releases. The PDSA process used in this project aligned very well with the development process regularly employed by the CATalytics team. The process also aligned well with the Critical Theory Epistemology framework as we sought to highlight student achievement outcomes and provide the tools for end-users to explore the ways that intersectional identities impacted those outcomes, for both the participating and non-participating reference groups, through the use of dashboard filters and drill-down capabilities (Capper, 2019). For example, end-users could query the incoming academic characteristics and student success outcomes for Latinx female students in Project C.A.R.E. compared with those who did not participate in the program. This allowed the departmental staff the tools to (1) look at intersectional student segments, (2) better understand how those target populations within the Project C.A.R.E. program were performing, and (3) compare that information to the non-Project C.A.R.E. reference group. This attention to intersectional identities was based on the Critical Theory Epistemology framework (Capper, 2019).

The final formative assessment took place two months later, in October of 2022. In this process step, final quantitative reports had been delivered to the personnel in ICA, and training/consultation had been provided. This training centered on ensuring that those staff members understood how to access the data, how to engage with the tools provided on the dashboard, how to correctly interpret the findings, and how to incorporate this new knowledge into funding requests, internal departmental planning, and stakeholder communication. These formative steps incorporated quantitative measurements around the number/percent of key stakeholders who engaged in the training on software functionality and data interpretation. As hoped, 100% of the stakeholders engaged in training. Training took place for ICA staff

– including Interim Director Rucker and the ICA administrative support associate Karin Kimenker. They were joined by their supervisor, Dr. BaShaun Smith. A separate training walkthrough took place with Vice Chancellor of Student Affairs Dr. Sam Miller and his direct reports, after Dr. Smith (who reports to Dr. Miller) showed him the work. It sparked interest among other senior leaders in the Student Affairs division, both for the compelling story it was able to uncover and the potential to extend the idea to other projects and programs in the division.

Finally, a driver measure was set around monitoring frequency of report access and frequency of data usage. While it is possible to see that the staff of ICA have all accessed the report at least once, because several of them were most interested in the high-level story that is easily captured with an export of the visualization into a PDF or PowerPoint, it is more difficult to understand how many times they have used those printouts or exports or what they have been used for (e.g., stakeholder communication, departmental planning). Overall, this was the formative goal that was least successfully evaluated. Monitoring access may be more useful as a long-term metric, or it may prove not to be a useful measure at all. Since the report will only be updated once per year, while the information and story provided within can be deeply useful, it is unlikely that we would ever see the staff accessing these reports multiple times a week, for example. And because exports can easily capture critical elements of the story that can be shared later verbally, in PowerPoint presentations, in budget requests or grant applications, etc., the number of times a report was accessed is not necessarily reflective of the number of times it was utilized or the overall value of the report to the ICA.

Even though this initial access and usage information was not particularly useful, the CATalytics team collects and routinely analyzes data on report access/usage, both in terms of frequency and audience. I will continue to monitor these usage statistics over time, particularly the number of times reports are accessed, what time of year reports are used, and the range of people viewing reports. As we develop the second phase of the dashboards, we will also have detailed conversations with all the report stakeholders about what they are using, when, and for what purpose. These usage statistics, both those collected automatically by our software system and the self-reported information from report stakeholders, will

help us continue to assess the success of these reports, whether the office continues to utilize them annually (or more often), when access typically takes place, which people/positions use the reports most often, and which individual report components are most frequently used. This is important both for post-hoc assessment and the formative evaluation that informs the next round of dashboard development and refinement.

Summative Evaluation of Improvement Methodology

In addition to formative assessment of the process, the initiative incorporated a summative assessment of the project results. Improvement Science seeks not just to make changes to an organization, but to use a structured approach to examine whether that change was indeed an improvement (Hinnant-Crawford, 2019).

The summative assessment steps are superimposed into the overall timeline in Figure 9, and they are further fleshed out with additional details in Tables 4 and 5. The approach to summative assessment in this improvement project was qualitative, utilizing stakeholder interviews. Semi-structured interviews were conducted with the three people intended to be the primary end-users, namely: Dr. BaShaun Smith who oversees the unit, Evelyn Rucker who is the ICA's interim director, and Karin Kimenker, the ICA's administrative support associate. (The complete interview instrument is in Appendix D.) In the original project proposal, the summative assessment was planned to be quantitative and conducted with a pre- and post-intervention survey. When OAR lost both staff members in the spring and the focus of the project narrowed to Project C.A.R.E. and ICA, the pool of stakeholders available for assessment had dwindled to less than five. Based on the small group size and the potential for additional turnover between the pre- and post-survey assessment periods (that ultimately did happen with Dr. Dana Patterson), the summative evaluation method was modified to stakeholder interviews, which were more appropriate for the smaller group size. Concerns about the group size were noted in the original proposal, prior to even the OAR staff departures. In the long run, the richer qualitative feedback provided during the interview process was an excellent culminating experience for the project.

Table 4*Summative Evaluation Measure Details*

| Type of Measure | Improvement Effort /Aim | Type of Data Collected | Frequency/Timing | Analysis Strategy |
|------------------------|---|---|---|---|
| Outcome | Departments report that reports improve ability to engage in departmental planning | Qualitative - Semi-structured interviews with stakeholders. | Collected at the end of the improvement effort | Thematic Analysis, Inductive, Case-Oriented |
| Outcome | Departments report that reports improve ability to advocate for resources | Qualitative - Semi-structured interviews with stakeholders. | Collected at the end of the improvement effort | Thematic Analysis, Inductive, In vivo |
| Outcome | Departments report that reports improve ability to communicate with stakeholders | Qualitative - Semi-structured interviews with stakeholders. | Collected at the end of the improvement effort | Thematic Analysis, Inductive, In vivo |
| Balancing | Time v. Value proposition. Users report that the value of the data tool is worth the time/effort needed to utilize it | Qualitative - Semi-structured interviews with stakeholders. | Collected only at the end of the improvement effort | Thematic Analysis, Inductive, In vivo |

Table 5

Summative Assessment Data Table

| Assessment | Date | Description |
|------------------------|--------------|---|
| Stakeholder Interviews | October 2022 | <u>Qualitative</u> - Semi-structured interviews were conducted with the three primary stakeholders who remained at the institution at the close of the project. The interview included questions about data access and barriers prior to project implementation, to what degree the project improved the ability for departmental planning, budget/resource advocacy, and stakeholder communication, as well as the cost v. benefit comparison for the project. |

The summative goal was that 80% or more of staff interviewed would report that the project improved their ability to undertake key functions – specifically departmental planning, advocating for budget/resource internally or externally, and communicating with stakeholders. Qualitative data collected during the interview process were evaluated using a thematic analysis (Lochmiller & Lester, 2017).

The analysis of the interviews relied on an in vivo qualitative coding approach, where the themes identified in the interviews arose from the actual “words or short phrases from the participant’s own language” (Miles et al., 2020, p. 65). Because there were only three interview subjects and they all worked closely together, there was quite a bit of overlap in the responses provided by the interview participants, including in some cases, repetition of the actual words and phrases used. This alignment of responses made it ideal content for an in vivo approach, as many themes were obviously and readily emerging. The approach was inductive, meaning that all the codes and themes flowed out of the interview data directly, as opposed to a deductive technique where a pre-defined list of themes is developed and then qualitative data are analyzed against the pre-existing list (Miles et al., 2020).

The open-ended responses collected during the interview process provided evidence as to whether the change was indeed an improvement for the staff members that the project most directly impacted.

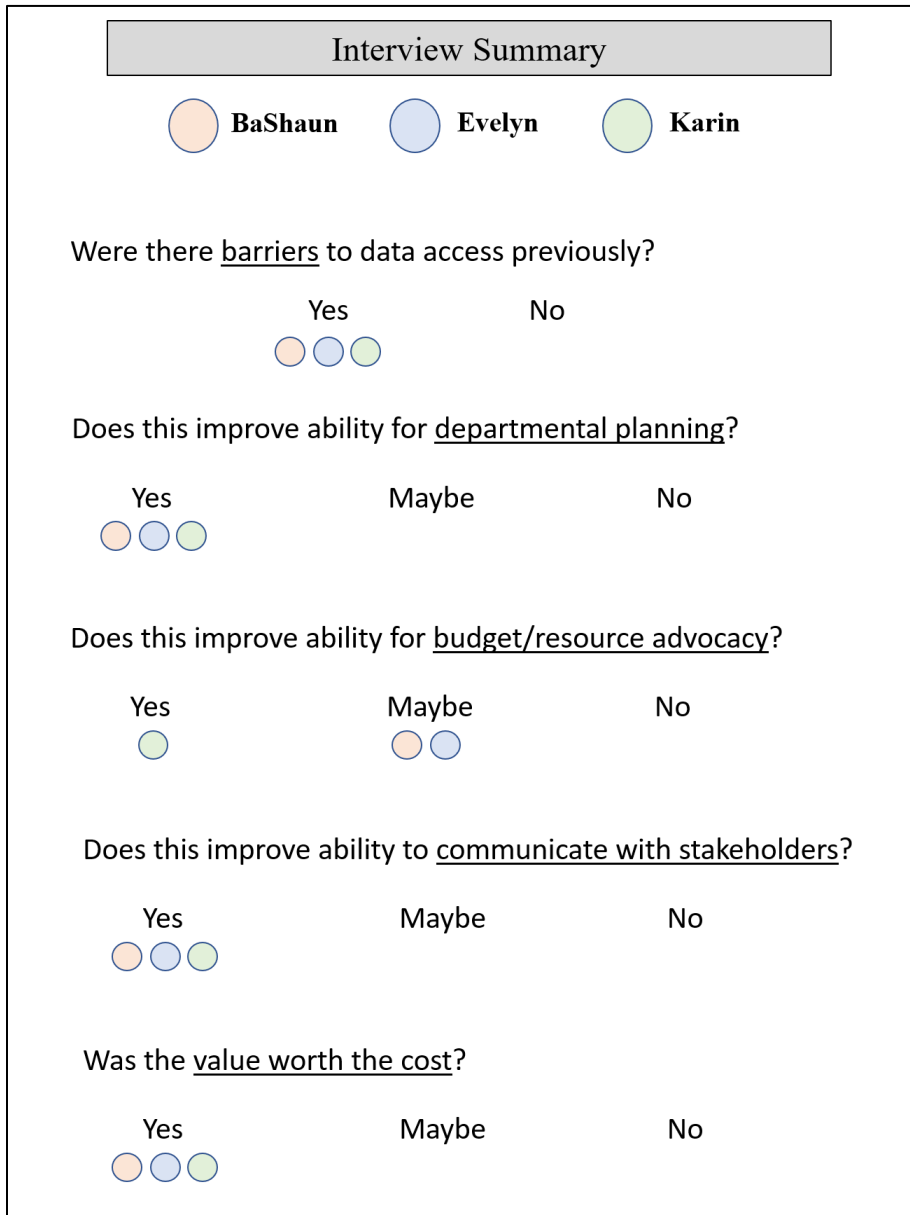
The interview did also include a question about the trade-off between cost, defined by the time and effort required to engage in the project, and the benefits associated with the new reports. This is a balancing measurement, a key feature in the Improvement Science framework (as outlined in Figure 10). Balancing measures take into account that while the project may result in an improvement, it is critical to acknowledge the cost of the project for the targeted departments. With this balancing measure, I sought to determine if the balance of the improvement outweighed the associated costs of staff time and effort.

It was anticipated that the stakeholders would report that the project resulted in a net improvement, and that gains were realized in all areas under consideration (i.e., departmental planning, resource advocacy, and stakeholder communication). Directors of both the ICA and OAR had expressed their desire for additional data access and ability to use data. The project itself was born out of discussions with these unit directors about their perception of what limited their ability to grow and serve students.

The summative interview results did align with the anticipate outcome. Below in Figure 13 the high-level interview results have been summarized relative to the five primary questions that interview participants were asked. Detailed interview analysis is provided in Appendix E.

Figure 13

Interview Summary



Outcome Measures

The first interview question was about the ability of the unit to access and use data prior to the implementation of this initiative. Participants were also asked to explain barriers to data access and use before the initiative. All three participants noted that some data were available before this project but that

there were significant limitations. Prior data collection mostly centered around the roster of participant students. One respondent noted that this was the most important part from her perspective because it allowed them to reach out to students over time via email, for instance to invite them back as Project C.A.R.E. mentors or to encourage attendance at other events. Karen Kimenker provided the most detailed account of the pre-initiative phase since she had been responsible for data collection and maintenance for several years. Each semester she would go into Banner and look up GPA information for students manually, one record at a time, using the roster IDs stored locally within a departmental spreadsheet. For the first semester, she would only find that semester GPA. At the end of the first year, she would locate second semester GPA and the cumulative GPA after the first year. She estimated that this manual process took one to two days each semester. There were occasionally other elements available through collaborative work with the business officer in the Student Affairs division, but additional information was not routinely available and when it was, it always relied on manual data collection. All respondents noted that the data previously available were simple or limited and did not meet their data needs. All noted that time was the most significant barrier. Access was another significant barrier noted by all respondents, specifically meaning that it was not clear where data were stored in Banner or how to pull them and/or that ICA staff did not always even have permission to access Banner tables with data that might be useful. Dr. Smith and Ms. Rucker discussed how the list or roster view did not effectively tell a story. Both also noted that the lack of longitudinal data on students was an important limitation.

The second question focused on whether the new reports provided ICA an improved ability for departmental planning. All three respondents agreed that the new tool did provide insights for staff that could inform departmental plans. Two respondents mentioned that the reports could be used to think strategically about attracting and recruiting new students, and which student populations might benefit the most from the programming. Another theme from the responses focused on academic support, which two of the respondents mentioned. The dashboard shows that, while Project C.A.R.E. students are retained at a higher rate (particularly in their first year), their average institutional GPAs do lag that of their peers. Coupled with qualitative data collected from the revised student survey in spring of 2022 (that indicated

that academic support was not a key strength of the Project C.A.R.E. program), staff are working on plans to increase the academic focus, with ideas like improved connection to the Writing and Learning Commons (WaLC) and the Math Tutoring Center (MTC), as well as the potential for developing study halls, for example.

Question three probed respondents as to the value of the new dashboards relative to their improved ability to advocate for increased funding or other resources, internally or externally (such as through grants). This question received responses that were the least positive overall with two respondents reporting “maybe” and one respondent reporting “yes.” Dr. Smith was the least optimistic about the prospect for increases to internal budgets. He explained that his lack of confidence about the prospect of increased funding was based on the institutional and divisional realities of shrinking enrollments and the resulting tightening of budgets across the board. Regardless of the strength of the program or the effectiveness in documenting and conveying that strength through the use of data and visualizations, in a tightening budget climate, additional funds may be impossible to obtain. Dr. Smith was optimistic about the ability to use the dashboard to improve the engagement of people across the institution. He described how he thought the data could be used to engage faculty and staff from academic departments, for example. Ms. Rucker also noted that she was not sure if it would be possible to obtain additional resources, though she was hopeful. Her comments centered on funding for the Project C.A.R.E. program itself. She noted that the program was free to students, and that many of the students would not be able to afford to participate if the program came with a fee. She was hopeful that the program could receive additional financial support in the future, to ensure that program costs are not passed along to the students. Ms. Kimenker noted that the department does not have a history of applying for external grant funds, but that these data could improve their ability to seek that type of funding in the future. All three respondents mentioned that the improved ability to tell the departmental story would be critical for any potential funding or resourcing opportunities. Dr. Smith said that “prior to this incredible project we didn’t really ... we didn’t tell our story.”

Next respondents were asked whether the dashboard would improve the departmental ability to communicate with stakeholders. This resulted in the clearest affirmative from all participants about the ways that the reports might impact departmental functioning. All three interviewees responded with “absolutely” and “definitely.” Two of the respondents focused on how the new quantitative data affirm the qualitative data that they had been collecting. While they do not discount the value of the student survey data, and especially personal testimony from students about what an impact the program made for them, they were very excited to have the quantitative data that support the same narrative. Dr. Smith mentioned that for him and others in his reporting line, this quantitative data is even more important than the survey data, because it is viewed as a “factual story” and not a “gut feeling.” He mentioned that the dashboards really helped him communicate the value of the program to his supervisor, his peers, and others in the institution. Ms. Rucker focused on her improved ability to talk with parents of prospective students, students themselves, and administrators. She also noted that being able to use student quotes and stories alongside retention data, for example, is especially helpful in talking with prospective families about how the program might positively impact their student’s experience. Ms. Kimenker talked about the retention story that the dashboard illuminated, and how important that will be to share with administrators and trustees, given the institution’s current focus and challenge with student retention.

Balancing Measure

The final question was aimed at capturing the balancing measure. This is an acknowledgment that positive movement in one direction could come at the expense or cost of decline in another way. Respondents were asked to consider the value of the project in terms of staff time and effort and whether the value of the project ultimately exceeded the cost. In response to this question all respondents unequivocally reported that the value did indeed exceed the cost. Ms. Rucker noted that the cost really was not much. Ms. Kimenker who engaged in the process of historic roster retrieval and cleaning with the CATalytics staff did note that there was some time and effort involved, but that this was the result of the history of how the rosters had been stored. She was very excited about the new process for storing rosters in Banner moving forward. Ms. Rucker and Ms. Kimenker noted that the project will save a

significant amount of time in future terms because it eliminates the process of manually looking up GPAs and other data elements from Banner. Also having the data about GPAs and other demographic and performance data available immediately to them is useful. Ms. Kimenker said, “[a]ll we have to do is send a list ... and in an instant ... So, what was once a day or two worth of time each semester to get that information, is now – it’s nothing, zero, an email.” Dr. Smith said, “If the cost was a million dollars, the value exceeds that.” Detailed interview analysis is provided in Appendix E.

Implications

Improvement Science is cyclical and iterative and the report development work of the CATalytics team is also cyclical and iterative. In this way the Improvement Science framework is an excellent fit for planning, implementing, and evaluating ongoing dashboard development. While we often are not quite so intentional about the development of formative measures, for example, in many other ways the development process employed by CATalytics already utilizes the tools provided by Improvement Science. As this project has drawn to a close and I have had time to reflect on the project from beginning to end, including the various tools utilized throughout, I see additional opportunity to continue to implement Improvement Science techniques in the work. For example, I plan to incorporate Improvement Science techniques in defining and understanding root causes of the problem and in developing the full range of potential drivers and process steps to determine which options are most actionable and provide the most leverage.

Critical Theory Epistemology was a guiding theoretical framework for this project. The tenants of that framework informed the need for this project, the overall direction and plan, and individual decision points along the way, such as within the PDSA cycles. That framework emphasizes the importance of work that helps to minimize oppression, such as the oppression experienced by those in marginalized racial/ethnic groups who attend PWIs (Capper, 2019; Capper et al., 2020). This type of suffering is perhaps especially evident for those who ultimately drop out and never obtain a college degree (while possibly incurring student loan debt that they are still required to pay) because the

institution did not provide an environment or services that maximized the likelihood of success for them and people in their demographic groups. This project seeks to minimize that suffering.

Critical Theory Epistemology advocates for the union of facts and values (Capper, 2019). This element was a critical component of this particular project, which sought to marry the institutions stated values about commitment to diversity and student success with quantitative facts about both those elements. It provides a tool that the ICA and the institution can use for many years into the future, which will help monitor that relationship to see if our actions and outcomes are aligning with these values, and monitor the extent to which these become more or less aligned over time (e.g., does the student success gap between the most and least successful groups relative to retention and graduation continue to shrink or start to grow?).

This project also centered on elevating the voices of the oppressed (Capper et al., 2020). Part of the project was the development of a tool that can be used for collecting direct feedback from underserved students. The project also sought to give a voice to the staff who run this program, allowing them input in determining what kinds of data and visualizations they wanted to see produced, and tools to advocate for their work into the future. Ultimately this work aimed at disrupting the status quo and changing the power dynamics in a direction that was more equitable and socially just.

In conclusion of this disquisition work, the initial version of this dashboard has been developed, published, and distributed to end users. However, even though this dashboard development process has been completed for this disquisition project, the dashboard will continue to be refined for use by the staff in the ICA and Student Affairs over time. The CATalytics team has already planned a phase two development that includes several additional variables that the unit would like to filter by, and another few visualizations around student major, department, and college, which may help the ICA link up with academic units in the support of students. Planned updates are already logged in the CATalytics project management software, and I anticipate that the next version will be published in the spring.

In addition to the next phase that is planned for ICA, other similar units and programs are taking note, and I anticipate that it will result in requests for additional dashboard development. This could

include anything from Greek life to students that utilize the gym, for example. A goal of mine will be to advocate for the prioritization of units that serve marginalized or underserved student populations, to continue to expand this effort of unit empowerment through the development of data resources, specifically for the goal of improving equity in student experience and student success outcomes. Examples include units and programs that serve Cherokee, first-generation, or low-income students, students with documented disabilities, or those that are emancipated, independent, aged out of foster care, or students without housing. There are many types of underserved students on campus, and a whole range of programs and offices that serve them. I would like to continue to make connections with those offices to see if the CATalytics team can help to illuminate their stories and impacts. Having the Project C.A.R.E. dashboard completed will help facilitate those conversations, by providing a tangible example of the kind of output that could be anticipated when an office engages with the CATalytics team.

Leadership Lessons

The improvement project generated new organizational learning and a number of lessons for both the ICA and IT, and about equity and social justice generally.

Leadership Lessons for the ICA and Similar Units

The Office of Intercultural Affairs proved to be an outstanding partner in this project, demonstrating interest, skill, and engagement with the various aspects of the improvement initiative. In many ways, engagement in this project was not much more difficult than the work they were already doing each semester – collecting student survey data and reviewing and managing rosters. This project did require a bit of extra time working with me to redesign the survey instrument and working collaboratively with the CATalytics team to clean historic rosters, but overall, the time commitment was fairly low, and the scope of the work was manageable for the unit, even given staffing turnover. A few important take-aways were illuminated for ICA and potentially other units that are similarly sized and positioned. The first is related to the value in engaging with IT and other service units on campus for work beyond the scope of what can be accomplished by the staff, software, and skillsets within the office. While things like the development of an interactive dashboard published to a university server might

seem out of reach in an office with few staff and limited technical resources, as this project demonstrates, sometimes the connection to a service unit, the request for help, and the potential resulting engagement can yield a large return for a relatively low cost. There are units across campus that specialize in different service functions, and it's worth making those connections and asking for help with specialized needs like data management and data visualization.

Another potential takeaway is the value of projects of this type. There was an absolutely golden story about the success of the Project C.A.R.E. program hidden in the data. My hope is that this project will provide value to the unit for years to come, in their ability to effectively tell their story. I can see already that the staff there feel empowered with the data, and that they are likely to see some tangible results from their ability to tell their story effectively. It may enable them to increase program enrollment/participation, conveying these new findings to potential students and parents. I hope, particularly with the combination of the quantitative data and qualitative student survey data, that they are able to identify strengths and weaknesses of the program and utilize this information for internal planning, resource allocation, and tweaking the program in data-informed ways. And finally, even though the budget situation at the moment is challenging, demonstrating that they are contributing to successful student retention, has the potential to help them garner additional budget support for staffing or mentor stipends. At the very least, I hope it protects the unit from budget cuts if/when the time rolls around that significant spending reductions become necessary. Units that are the most successful are often spared the largest cuts, and I hope these new data help ICA make the case that they are very successful.

Leadership Lessons for CATalytics and Other Data Units

It is unlikely that this project would have taken place without this disquisition work. The CATalytics team is small, and the backlog of data work is large and growing. We generally work on projects that contain data pertinent to enrollment, admissions, funding, and student success broadly. Even when we include data like Project C.A.R.E. in the work, it generally appears on dashboards that are not accessible to staff members like those who work in ICA, or it is packaged in such a way that smaller units are unlikely to effectively find and utilize the work. We tend to produce datasets with millions (or tens of

millions) of rows and dashboards with a dizzying array of filters and parameters. I do think there is a place for those reports. Reports like those capitalize on the strengths of the CATalytics team, producing data processes and products that arguably no other WCU unit could provide. The views in those kinds of reports can answer a hundred different questions and be used for deep data exploration. The downside of those dashboards though, is that they can be quite intimidating and require a fairly high technical ability from the end-user. For the most part, they do not tell a story as a starting point, though a story can be derived from data exploration and manipulation.

The Project C.A.R.E. dashboard was a completely different kind of approach. As the literature review above outlines, close-to-practice data provide a kind of value that cannot be replaced. This project was a case study in small data. One program in scope. Only a few variables and a small handful of filters, compared to the much more complicated data models and dashboards we typically produce. The dashboard made the story clear without any manipulation. This kind of dashboard provides a very easy entry point for end-users in offices that are small, busy, maybe only need data occasionally, and do not have expertise with data analysis. Once end-users are able to successfully find and use data on their more tailored dashboards, they may develop a skillset and appetite to dig into more complicated reports. Whether they do dig in more deeply or choose to end their engagement with the report tailored to them, there can be tremendous value for the unit, as they gain an ability to tell their story more effectively with facts and figures (perhaps in combination with qualitative data collected directly from participant students). This project provided a very successful entry into this type of report development, which we can use as a model for future work with other similar departments and programs.

I assumed that I would get the support and cooperation of my colleagues on this project, but that it might be tough to prioritize these types of projects moving forward, once the requirements of my disquisition were satisfied. However, the dashboard was so well-received and told such a powerful and exciting story that it actually created quite a bit of momentum to expand this approach. In some ways I am lucky because the Project C.A.R.E. story is so compelling it led to excitement from other unit and division directors to be curious about what is possible for their programs. But maybe, in other ways,

many programs have a unique and special story to tell or contribution they are making, and this approach lets us customize a dashboard to capture and highlight that story.

This month the CATalytics team presented our annual report to the Chancellor, Provost, and CIO. During this presentation, we showed some of the work completed this year and discussed our plans and priorities for the coming year. We were able to provide a demonstration of the Project C.A.R.E. dashboard and advocate for expansion of this type of reporting in the coming year. The Chancellor found this story so compelling (along with other dashboards that were built this year), that she asked for a follow-up meeting to dig into the dashboards a little deeper. She also specifically mentioned that she intends to learn more about the Project C.A.R.E. program. This is easily the kind of story that would be exciting for her to share with donors, Board of Governors members, or legislative representatives.

Leadership Lessons for Equity Work at WCU

WCU has consistently espoused a commitment to equity and to the value of diversity. However, it can be difficult for the institution to find successful approaches to actualizing or materializing that commitment in ways that genuinely improve the student experience and student outcomes. This is particularly true during times of significant resource constraint, when it is less feasible to use funding to support new programming, for example. But the alignment of our values with the facts of how the organization runs is critical toward ensuring equity, as Critical Theory Epistemology contends (Capper, 2019). Supporting university departments that serve diverse student populations is a model for how we can impact and improve the student experience without initial expenditure of additional resources. Utilizing the in-house skills of the CATalytics team, we were able to empower the ICA with information that helps them operate more effectively and could potentially help them attract additional funding from external sources. Helping the university leadership better understand which units are making these types of student success contributions could also help protect the departments and programs that provide the most positive impact, in instances where funding reductions must occur, or point to units that would be strategic for investment when funding is more readily available. In summary, data are a key resource that

can be used for promoting equity and social justice at WCU, and better exploration and utilization of this resource could provide an important contribution to actualizing WCU's diversity commitment.

Conclusion

When I initially proposed this disquisition, I presented the case for addressing the success of unrepresented students at WCU, specifically African American and Latinx students, by focusing on the Project C.A.R.E. program offered by the ICA. The mechanism used to support the ICA was improved access of close-to-practice data and information about their student population (i.e., not student success measurement of all African American and Latinx students, but rather the specific student population served by Project C.A.R.E.). This improved access was meant to bolster their competitiveness with internal and external funding opportunities, improve their ability to utilize existing financial and personnel resources through strategic departmental planning (e.g., helping them determine within the department where to invest budget and/or personnel time or focusing on tweaks that could be made to improve the program), and strengthen their ability to communicate with stakeholders, such as administrators, current and prospective students and their parents, accreditors, alumni, and potential donors.

The project utilized many tools from the Improvement Science framework. Critically, in line with the elements of the primary iterative improvement approach offered with the Plan-Do-Study-Act Cycle (PDSA), the project included both assessment of the project outcomes and of the process itself. A Design Team was employed, the members of which contributed both professional and academic expertise, as well as a range of personal demographic positionalities, which helped to ensure a diversity of perspectives and range of experiences. PDSA Cycles were used to plan initiative steps (Plan), execute the actions (Do), study the process itself (Study), and incorporate that organizational learning into the next phase or iteration of the cycle (Act). The formative assessment (i.e., study of the process itself) was not an afterthought, but rather time for reflection and organizational learning that was built into the project timeline. It is this intentionality that sets Improvement Science apart from many more typical and reactive higher education initiative implementation approaches.

The project utilized the framework provided by Critical Theory Epistemology for demonstrating the need/value of the work, developing the plan, and even making operational decisions about what data elements to include and how to provide data tables and visualizations in the reports that were developed. From this framework, we centered our planning on reducing oppression, alignment of values and facts, elevation of voices of the marginalized, and disruption of the status quo (Capper, 2019).

I am so pleased to report that we were able to execute the plan as proposed, with the only major change being the re-focus specifically to Project C.A.R.E. after the departure of all staff from the OAR. As with many disquisitions, this project required the buy-in of a variety of stakeholders including my supervisor and the collaboration of a number of different team members both inside the ICA and from IT primarily. I was very pleased to be able to successfully navigate those connections and partnerships, using my developed experience as a scholar-practitioner. I was most excited to see the story unfold as we collected the data and ultimately constructed and delivered the dashboards to the end-users in ICA. While I was originally hopeful about my ability to complete this project, I was more skeptical of my ability to continue to engage in this kind of work moving forward as part of my day-to-day role as a Business Intelligence Analyst with IT. To my delight, the incredibly compelling story that emerged from the ICA data, coupled with the end-users' very positive experience of using a dashboard that was tailored so specifically for their use, has led to excitement and expansion potential well beyond my expectation. I am excited that my supervisor and members of WCU's Executive Committee see value in this project, both in terms of the illuminated story of the ICA and the potential of these types of projects moving forward. I will continue to engage in this work to the extent that I am able and will continue to focus my efforts on using this approach as a tool for promoting social justice and equity among student populations at WCU.

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Appendix A

Previous Survey Instrument

Project C.A.R.E Alumni Survey

Q1 Your Full Name

Q2 Your Email Address

Q3 Please list year you started at WCU

Q4 Please list graduation year

Q5 Did you participate in Project C.A.R.E?

YES

NO

Q6 If you answered yes, please think back to your year(s) in Project C.A.R.E and answer next questions.

Q7 Please indicate the impact Project C.A.R.E had on your academic success at WCU

- Highly Impactful
- Somewhat Impactful
- Minimal Impact

Q10 Please indicate impact Project C.A.R.E had on your social success at WCU

- Highly Impactful
- Somewhat Impactful
- Minimal Impact

Q9 Did you serve as a Project C.A.R.E Mentor?

- YES
- NO

Q8 Briefly describe your experience in Project C.A.R.E

Q12 Project C.A.R.E -culturally aligned retention enhancement- is a mentoring program. Peer mentors help new students find their way to academic and social success throughout their entire first year at WCU. Project C.A.R.E is intentional in targeting underrepresented students who are more likely to experience societal racism, lack of access to social resources and inadequate educational preparation during their

lifetime. However, the program is open to any students who demonstrates a need for a high-touch, culturally relevant, mentoring experience.

Q13 Please indicate the impact you feel a program such as Project C.A.R.E would have on the success of incoming students at WCU

- Highly Impactfully
- Somewhat Impactfully
- Minimal Impact

Q14 Please describe why you think an experience like Project C.A.R.E might impact students transitioning into WCU or how it might change their college experience.

Q15 Are you aware of any WCU alumni or pass students who participated in Project C.A.R.E? (If you did participate in Project C.A.R.E., do you know of anyone else who participated? If you did not participate in Project C.A.R.E., are you aware of others who did participate?)

- Yes
- No

Q16 Please list full name of alumni or former student who you know participated in Project C.A.R.E

Q17 List email of participant if available

Q18 List phone number of participant if available

Appendix B

Revised Survey Instrument

Project C.A.R.E Post-year Survey

Q1

This is a survey from WCU's Intercultural Affairs Office about your experience with Project C.A.R.E. this year. This survey will take approximately 7 minutes. If you have any questions or would like to speak with someone, please contact Evelyn Rucker at 828-227-2615 or erucker@wcu.edu

Thank you for your participation!

Q2 Below please rate the impact Project C.A.R.E had on each area of your first-year experience at WCU.

| | High Impact | Somewhat of an Impact | Minimal Impact | Not Applicable |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Successful management of your academics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Successful engagement with peers and classmates socially | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Helped you find and engage with leadership experiences/opportunities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Helped you engage with out-of-classroom experiences (clubs, sports, student organizations, etc.) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Successful transition to college | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q18 Were you a Mentor or Mentee for the 2021-2022 academic year?

Mentor

Mentee

Display This Question Only If:

Were you a Mentor or Mentee for the 2021-2022 academic year? = Mentor

Q3 Below please rate the following experiences/elements of Project C.A.R.E

| | Exceeded my Expectations | Met my Expectations | Did not meet my Expectations |
|-----------------------------|--------------------------|-----------------------|------------------------------|
| Retreat | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mentor Training | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mentorship Pairing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Special Events and Programs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Engagement with ICA Staff | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Display This Question Only If:

Were you a Mentor or Mentee for the 2021-2022 academic year? = Mentee

Q4 Below please rate the following experiences/elements of Project C.A.R.E

| | Exceeded my Expectations | Met my Expectations | Did not meet my Expectations |
|-----------------------------|--------------------------|-----------------------|------------------------------|
| Retreat | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mentorship Pairing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Special Events and Programs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Engagement with ICA Staff | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q5 Please describe how Project C.A.R.E impacted you and your ability to navigate your student experience this year

Q6 Were you engaged with your mentoring relationship throughout the entire academic year?

- Yes
- No

Display This Question Only If:

Were you engaged with your mentoring relationship throughout the entire academic year? = No

Q7 Please identify why you were not engaged with the mentoring relationship for the duration of the year
(select all that apply)

- Mentor/mentee partner was not responsive
 - You were too busy to participate
 - Not a good fit between mentor and mentee
 - Not enough structure, prompting, guidance from Intercultural Affairs
 - Other: Please Specify _____
-

Q8 The time commitment for participating in Project C.A.R.E was

- Too little
- Just right
- Too much

Q9 How did Project C.A.R.E impact your decision to continue your WCU experience?

- A High Impact
- Somewhat of an Impact
- Minimal Impact
- Not applicable (not returning)
- Not applicable (graduating)

Q10 Please rate your experience with Project C.A.R.E overall

- Extremely Positive
- Somewhat Positive
- Somewhat Negative
- Extremely Negative

Q11 Briefly describe your Project C.A.R.E experience this year

Q12 Please describe how Project C.A.R.E can be improved in the future

Q13 Would you recommend Project C.A.R.E program to an incoming WCU student?

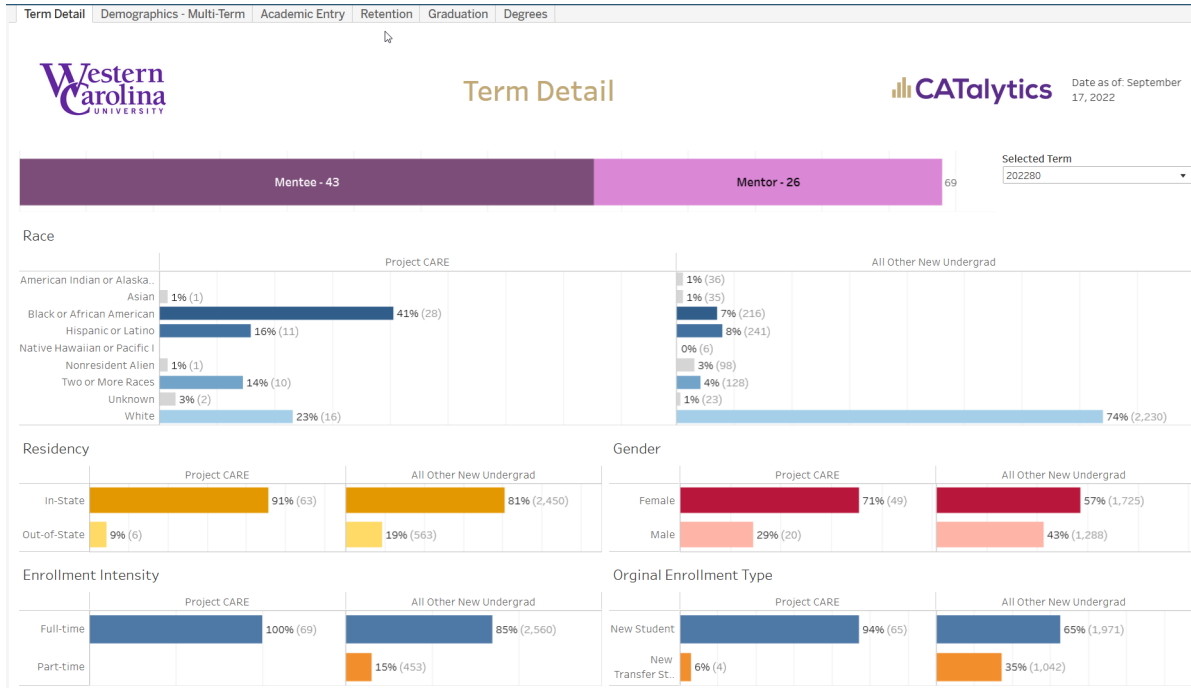
- Yes
- Maybe
- No

Q14 Why or why not?

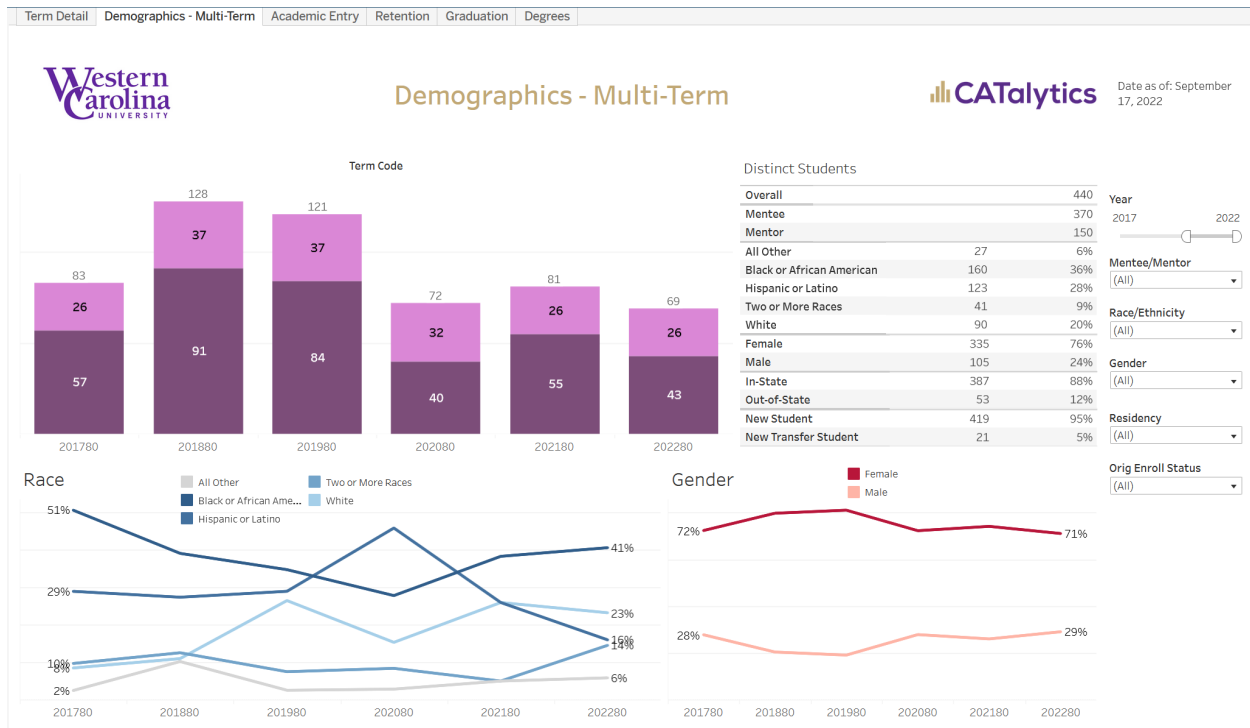
Appendix C

Dashboard Views

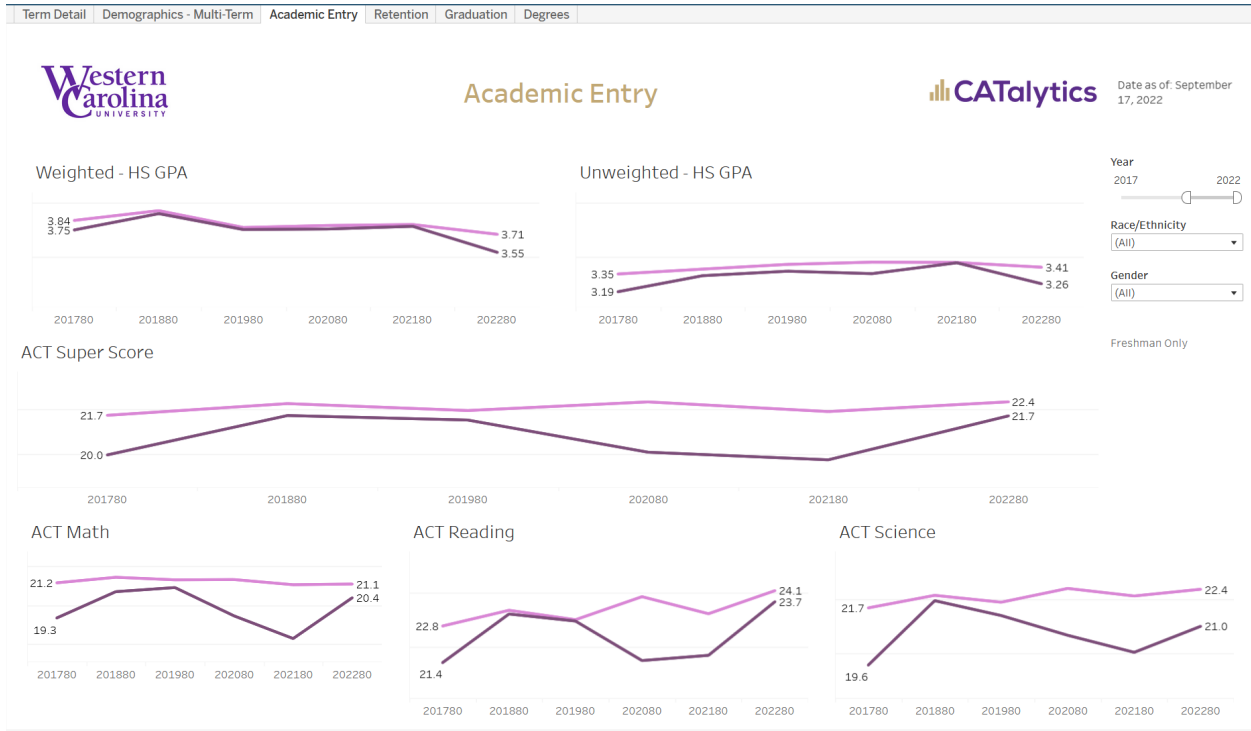
Term Detail



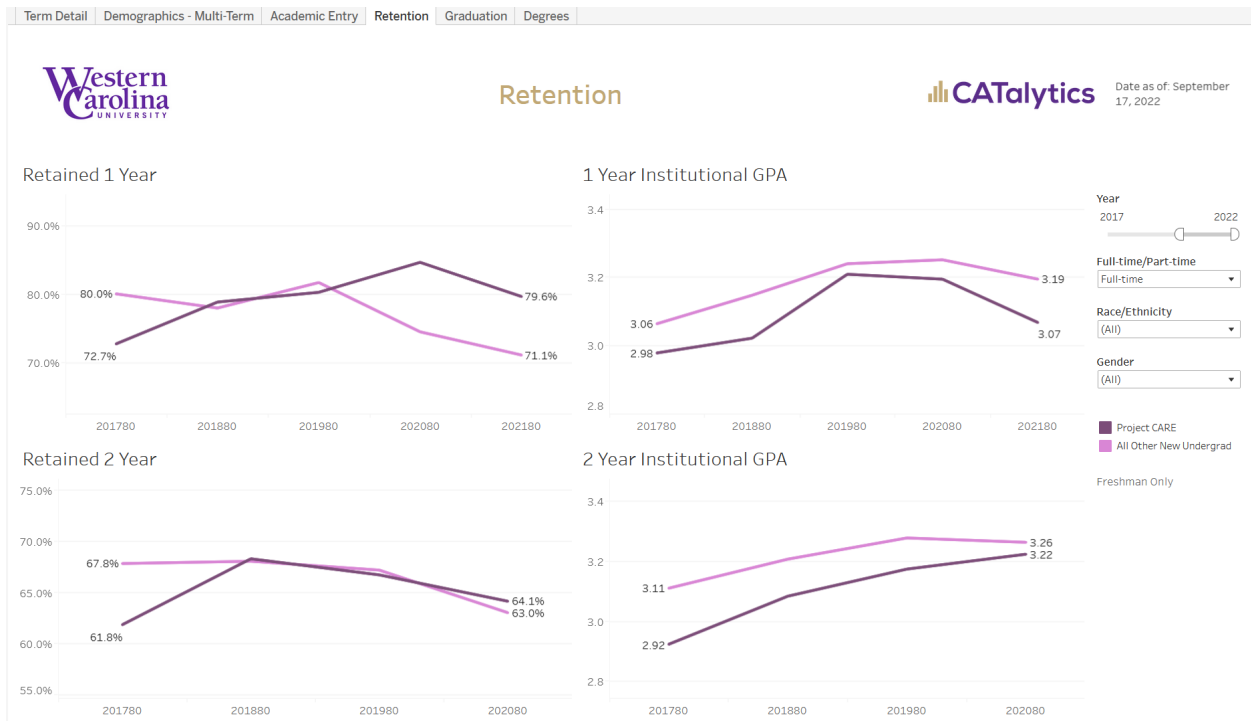
Demographics – Multi-term



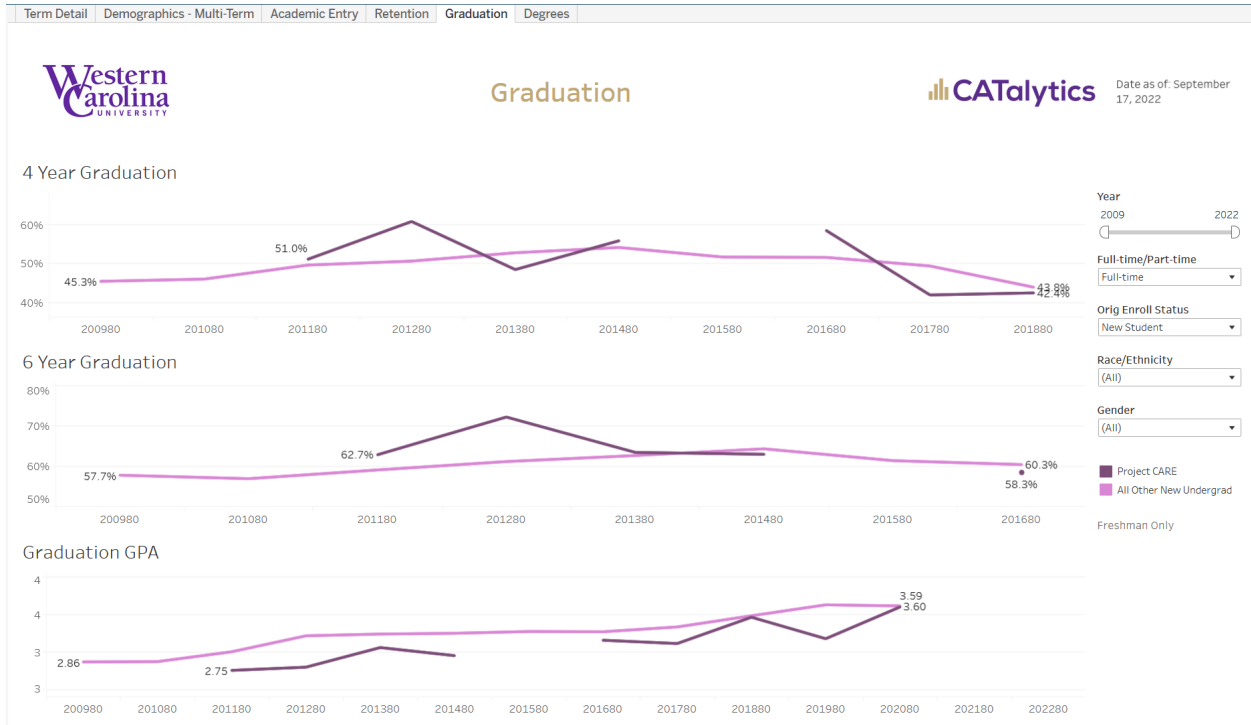
Academic Entry



Retention



Graduation



Degrees

| Graduation program Inst | Project CARE | All Other New Undergrad |
|--------------------------------|--------------|-------------------------|
| Accounting BSBA | 0.4% | 1.9% |
| Anthropology BA | 0.4% | 0.1% |
| Anthropology BS | 2.6% | 2.0% |
| Art BA | 0.9% | 0.5% |
| Art BFA | 0.4% | 1.4% |
| Art BSED | | 0.2% |
| Athletic Training BS | 0.4% | 1.3% |
| Biology BS | 5.2% | 5.3% |
| Birth/Kindergarten Distance BS | | 0.2% |
| Business Admin & Law BSBA | 2.6% | 2.3% |
| Business Admin & Law BSBA Dist | 0.4% | 0.4% |
| Business Administration MBA | | 0.0% |
| Chemistry BS | 3.1% | 1.5% |
| CommunicationSciDisorders BS | 1.7% | 2.3% |
| Communication BS | 7.0% | 2.5% |
| CommunicationSciDisorders MS | | 0.0% |
| Computer Information Sys BSBA | 3.1% | 2.1% |
| Computer Science BS | | 1.0% |
| Construction Management BS | 0.4% | 1.9% |
| Criminal Justice BS | 6.6% | 5.9% |
| Criminal Justice BS Distance | | 0.1% |
| Electrical & Computr Engine BS | 0.4% | 0.6% |
| Electrical Engineering BSEE | 0.4% | 0.9% |
| Elementary Education BSED | 2.2% | 3.5% |
| Emergency & Disaster Mgt | | 0.2% |
| Emergency & Disaster Mgt Dist | | 0.2% |
| Emergency Med Care -BS Distanc | | 0.0% |
| Emergency Medical Care BS | | 1.0% |
| Engineering General BS | 0.4% | 1.3% |
| Engineering Technolov BS | 0.4% | 2.3% |

Appendix D

Interview Questions

Please describe your access to data and ability to use data about Project CARE prior to recent data developments. Were you reliably able to access what you needed and to use data? If not, please describe what the problems or barriers were.

This project was aimed at providing access to more actionable Project CARE data. I'm going to ask you how improving data access and providing more actionable data might have impacted you and your department in three different ways, or how it might in the future.

First, do you believe that the reports will improve your ability to engage in departmental planning?

Do you believe that the reports will improve your ability to advocate for funding or other resources for Intercultural Affairs broadly or Project CARE specifically? This could be related to internal budgets or external funding, such as grants.

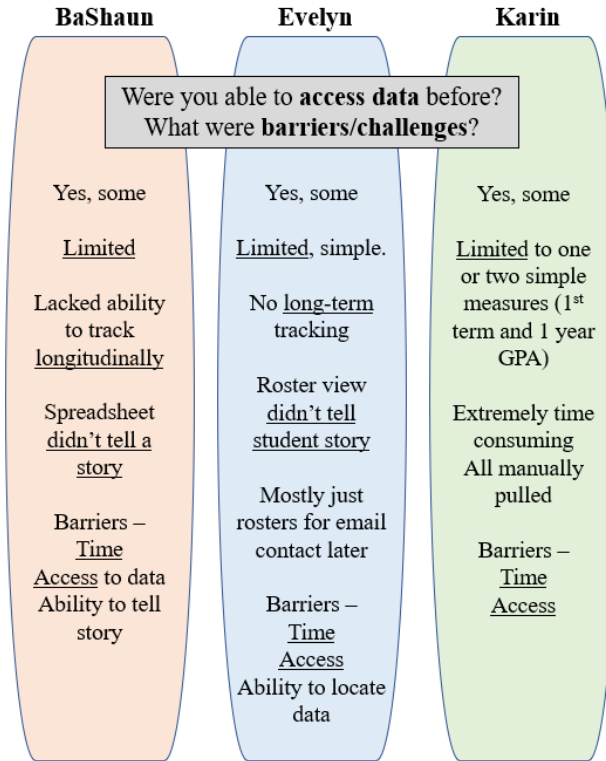
Do you believe that the reports will improve your ability to communicate with stakeholders (e.g., administrators, alumni, current and prospective students)?

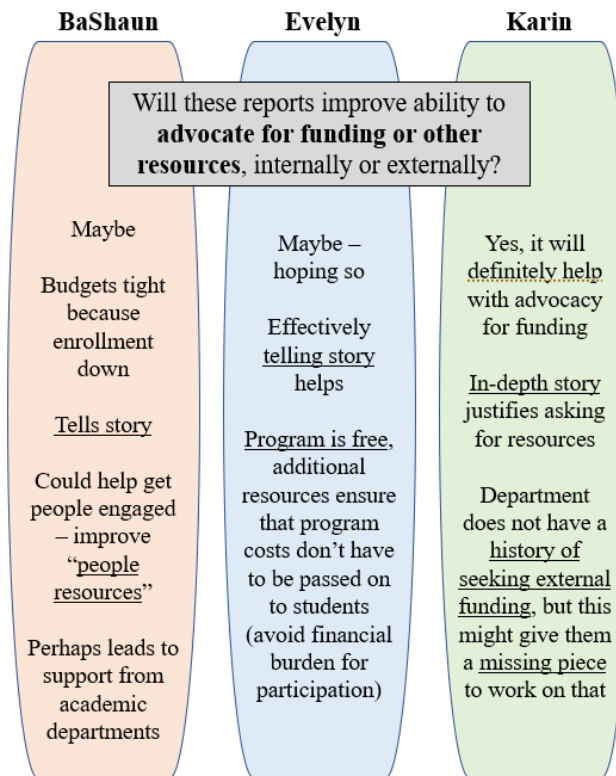
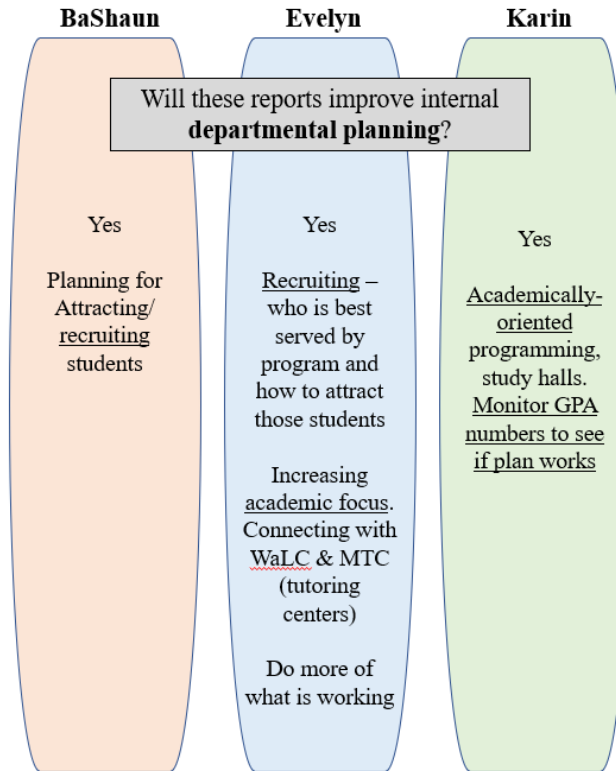
While the reports provided may have improved access and ability to use data, there are associated costs with the project, especially as this relates to staff time and effort. Please tell me about the cost in staff time and effort. How hard was it for ICA to engage in this project?

Do you believe that the value of this project exceeds the cost or not?

Please provide any additional feedback about this project, including ideas, questions, or concerns.

Appendix E
Interview Detail





| BaShaun | Evelyn | Karin |
|--|--|--|
| <p>Will these reports improve ability to communicate with stakeholders?</p> | | |
| <p>Absolutely, yes</p> <p>Already have <u>qualitative</u> data – this <u>quantitative</u> data was really needed</p> <p>Helps tell factual story. Not a “gut feeling”. <u>Reinforces qualitative</u></p> <p>Communicate with boss, peers, <u>others</u> in institution</p> | <p>Absolutely, yes</p> <p>Already so much <u>qualitative</u> data. This backs up <u>that story</u> – backs up positive things that students say</p> <p>Will help when talking to <u>parents, administrators, students themselves</u></p> | <p>Absolutely, yes</p> <p>Talking to <u>prospective students</u></p> <p>Retention so important (with <u>administration</u> and <u>trustees</u>)</p> <p><u>Retention rate</u> especially important – how programs like Project C.A.R.E. can help with retention</p> |

| BaShaun | Evelyn | Karin |
|---|---|---|
| <p>When comparing the value of the project with cost (in time and effort), was value worth the cost? [Balancing measure]</p> | | |
| <p>Absolutely, yes</p> <p>If cost was a million dollars, value exceeds that</p> <p>Value is high now and will be in the future</p> <p>More than worth time/effort</p> | <p>Absolutely, yes</p> <p>Cost was very little</p> <p>Staff really excited about it</p> <p>Looking toward the future, we get way more and it costs us way less</p> <p>There is also a cost to not having the data</p> | <p>Absolutely, yes</p> <p>It did take time to clean old rosters, because of the way records were kept and changes over time (like 92# as ID)</p> <p>From now on though, save a day or two each year</p> <p>Instead of days, now minutes</p> |