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Leadership Practices in Scaling Efforts in Community Colleges

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ABSTRACT

Leadership in community colleges, and postsecondary institutions more broadly, plays a central role in the sustainability and scaling of promising innovations within institutions. Understanding what leaders *do* to support the sustainability and scaling of these innovations is crucial for helping leaders develop practices that enable them to support these efforts. Using practice theory as a guiding frame, this study sought to unveil central practices that shape efforts to scale a promising, evidence-based mathematics course within two two-year colleges. We found that executive and mid-level leaders engaged in the intertwined practices of *tracking* and *leveraging*, where they attended to institutional culture, practices, and policies, and drew on these institutional features to both constrain and enable efforts to scale. Our study highlights the power of examining practices in the day-to-day work of leaders to illuminate what leaders do to scale or inhibit innovations in their institutions.

PLAIN LANGUAGE SUMMARY

Although researchers agree that leadership is central to the success of promising innovations in community colleges, it is much less clear what it is that leaders *do* to support innovation. Our study aimed to illustrate *how* leaders – both executive leaders as well as faculty leaders – supported or limited the success of promising innovations on their campus. To do this, we studied efforts to scale evidence-based, research-backed mathematics courses, the Carnegie Math Pathways (CMP), at two, two-year colleges. We found that leaders engaged in two tightly connected practices: tracking and leveraging. First, leaders *tracked* the culture, practices, and policies of their colleges to gauge whether and how CMP would be taken up in the college, both initially and at scale. In one example, a mathematics department chair learned about CMP at a conference but decided to delay introducing it to his college because of a policy that only allowed new courses if a program agreed to make it a requirement for graduation. Additionally, leaders *leveraged* institutional culture, practices, and policies, and their positions to support or limit scaling efforts of CMP. This same department chair later used the policy that initially prevented him from introducing CMP by “selling” the course to programs looking for appropriate math courses after new policy changes. Our study highlights the power of examining moment-to-moment practices in leadership. We believe giving light to leadership practices like these can be powerful drivers for leaders’ professional learning by offering potential repertoires for leaders to develop.

Introduction

The community college in the United States has served a critical role in expanding access to postsecondary education, with 40% of all new postsecondary students beginning at a community college (Cohen et al., 2013). More than half of all students take at least one course at a community college within their postsecondary education experience. One feature of community colleges is that they are open-access, meaning that anyone that has earned a high school diploma or equivalent is eligible to enroll. This,¹ along with the generally low-cost and student-driven missions of many community colleges, can create a postsecondary hierarchy that places community colleges in a lower tier (Stich, 2021). These institutions enroll a higher percentage of low-income, first-generation, and BIPOC (Black, Indigenous, People of Color) students, while at the same time receiving less state funding and graduating a smaller percentage of students than the selective four-year colleges that exist within a higher tier (McCambly et al., 2023). This positioning of community colleges and the large percentage of students beginning their postsecondary careers at these schools elevates their importance in implementing institutional and curricular reforms to increase student success with over 80% of first-time community college students interested in earning a bachelor's degree (Handel & Williams, 2012).

Just as the community college holds a unique position in the higher education landscape, so does the community college faculty member. Faculty in the community college are majority part-time (also referred to as adjunct or contingent faculty), with just 35% of community college faculty employed full-time.² These full-time faculty have an ever-expanding list of duties at the college beyond instruction including advising, committee and grant work, and curriculum development. With their broad levels of responsibility across the institution, full-time faculty also have leadership roles, such as department chair, program director, and committee cochair. This landscape for faculty also includes shared governance, a central feature of community college leadership. Garnering buy-in and establishing trust with community college interest-holders such as faculty and deans, is central to the work of change, reform, and transformation of community colleges in order to increase access and better meet the needs of students and communities (Kater & Burke, 2022). This is particularly true for the work of scaling up promising research- or evidence-based initiatives, which rarely scale past "boutique" programs and into sustainable reforms and transformations (Asera et al., 2013).

The challenges with scaling transformation in community colleges extend to community college mathematics. A growing body of evidence shows that traditional mathematics pathways – characterized by a reliance on high-stakes placement exams, multilevel prerequisite course sequences, and decontextualized, algebra-based course offerings – are correlated with low rates of course completion, credit-level course enrollment, credit accumulation, and degree attainment (Chen, 2016; Hodara, 2019). Over the last several years, efforts to improve student outcomes in math courses that enable transfer have led to many college and statewide efforts to accelerate the student math pathway with the goal of completing college transfer level math (often referred to as gateway math) within the first year of enrollment. This focus on postsecondary education first-semester math course-taking patterns is most often referred to as "Early Momentum" (Jenkins & Bailey, 2017; Zhang, 2022), which research by the Community College Research Center (CCRC) has identified as one of a set of key indicators of future student success (Belfield et al., 2019). Policies have shifted in several states in an effort to dismantle the status quo, reforming placement procedures and requiring acceleration or direct enrollment into college-level courses (Ngo et al., 2018). Additionally, a variety of organizations have developed promising approaches that show compelling evidence of effectiveness. The Carnegie Math Pathways (CMP) courses Statway and Quantway, for example, are designed to accelerate students to and through college-level mathematics in a single year, providing them with opportunities to learn mathematics content in engaging and relevant ways within student- and problem-centered environments that support persistence and engagement. These math pathways have shown that students can be successful in courses that streamline, contextualize, and accelerate the course content over the course of a year (Huang, 2018).



Despite the success of these initiatives, they have suffered from challenges in scaling to broaden access (Bickerstaff et al., 2018). To better understand how to support effective implementation of promising innovations, we seek to examine how the efforts of institutional actors who serve as leaders in their institutions (e.g., faculty, department chairs, administrators) both constrain and enable efforts to scale math pathways reforms within their institutions. We examine the actions of leaders within institutions – defined broadly to include so-called mid-level leaders – because they frequently serve as gatekeepers, implementers, and negotiators of conflict (Iverson et al., 2020). Community college researchers describe mid-level leaders as those who are not positioned as executive leaders but instead take up leadership roles and engage in leadership practices from a variety of positions within the college, such as faculty, deans, and advisors (Conrad & LeMay, 2020; Iverson et al., 2020; McPhail & McPhail, 2020). We also focus on leaders because of the role champions of innovations play in pulling such innovations through and pushing them upwards throughout the system (Day, 1994; Kriz et al., 2013). We attend to *how* leaders operate in relation to math pathways reform in order to generate valuable lessons about techniques, strategies, activities, and processes that enable and constrain efforts to scale promising curricular and instructional innovations in community colleges. In this project, we define implementation at scale using Coburn's (2003) conceptualization of scale as the enactment of the CMP program that serves a significant number of eligible students in an institution and that results in deep, consequential, and sustainable change in interest-holder beliefs and practices at both the classroom and institution levels. This type of change is referred to as "second-order change" by Kezar (2018) and requires shifts in assumptions as well as modifying institutional processes and structures. Second-order change is more likely to garner resistance than first-order change – changes that fit more easily into existing structures and courses. Curricular change is often assumed to be first-order change when in fact it is most commonly second-order change; this assumption can be a significant barrier to scaling (Kezar, 2018).

The questions driving this study are:

- (1) What practices of institutional leaders centrally shape the implementation and scaling of curricular and instructional innovations in community college math?
- (2) What practices emerge in both successful unsuccessful efforts to scale curricular and instructional innovations in community college math?

In addition to generating insight into efforts to scale promising mathematics initiatives, we view this study as also motivating the need for closer examinations into *how* leaders constrain and enable efforts to scale second-order change initiatives in postsecondary institutions more broadly.

We take up these questions within the context of Scaling Up through Networked Improvement (SUNI), a five-year National Science Foundation-funded project intended to test and refine a practical theory of scaling complex educational innovations within institutions of higher education. Beginning in Years 2 and 3 of the project, SUNI partnered with three colleges interested in scaling the Carnegie Math Pathways (CMP) within their institution to learn about, study, and improve their scaling efforts. Since the launch of the CMP in 2011–12, Statway and/or Quantway have been implemented in over 100 institutions and impacted over 40,000 students, increasing developmental math and college credit completion rates from nearly 6% to 50% within a given year (Huang, 2018). The success of CMP across institutions and regions qualifies it as a promising innovation, creating a unique context in which to study efforts to scale innovations within institutions. The SUNI project also included leadership coaching to examine how coaching can support the development of leadership capacity to scale these innovations. SUNI coaches were assigned to these colleges and met with leadership regularly to provide them with guidance and support as they embarked on their scaling efforts.

In this paper, we first situate the study within existing literature on curriculum reform and policy implementation in community colleges, highlighting where our study builds and expands on this knowledge. We then articulate our conception of *practices* as it relates to leadership and scaling, breaking down dualisms between action and structure and instead viewing action and structure as mutually

constitutive in order to see how scaling efforts are constrained and enabled by, and enacted through, organizational context. We then discuss the data we collected and analyzed across multiple institutions to understand scaling efforts and practices in those settings. We surface the central practices leaders engaged in as it pertained to scaling before turning to implications of this study for the field.

Literature review

We situate our study within conversations about curricular and instructional reform in postsecondary institutions, including curricular and instructional policy shifts locally and within institutions, in order to unveil how leaders aim to scale a curricular and instructional innovation within constantly changing community college contexts. Additionally, attention to how leaders scale requires a focus on leaders' implementation in community colleges broadly. Our study seeks to build on this literature to examine leadership practices that contribute to scaling curricular and instructional innovation, often within the context of broader policy shifts and reform efforts in community colleges.

We begin with a brief overview of recent literature on the uptake, implementation, and scaling of curricular and instructional innovations in postsecondary institutions, broadening the focus beyond community colleges to draw lessons from conversations within a broader literature base. Prior research has revealed insight into the factors that enable and constrain the uptake of curricular and instructional innovations in postsecondary institutions. Shadle et al. (2017), for example, reveal 15 categories of barriers faculty in a four-year research university faced when implementing evidence-based instructional practices, such as time constraints, instructional challenges, a loss of autonomy, and resistance to change. Shadle and colleagues concluded that a culture shift in relation to teaching is needed in postsecondary institutions to implement and sustain curricular and instructional innovations. Similarly, Foote et al. (2016) examined the implementation of an instructional reform effort focused on promoting active learning in postsecondary institutions, aiming specifically to understand the factors that enable successful implementation. Their study revealed eight factors that enabled successful, larger-scale take-up of active learning: administrative support; documenting and leveraging of evidence of local success; securing of funding; interacting with outside users; establishing a multi-member initiation team; a culture supporting active teaching; the presence of an enthusiastic champion; and professional development and faculty support. Through interviews with those implementing the innovation at different institutions, the authors learned that significant variation existed with regard to how an innovation is initiated in successful efforts. For example, both top-down and bottom-up implementation approaches were successful in different settings. These studies highlight a range of factors congruent with Asera et al. (2013) report in which the authors argue that community college leaders ought to network with a wide range of colleagues within their institution in order to garner buy-in from faculty and administration and provide faculty support and professional growth. Similarly, Kezar's framework for change (2018) identifies four steps for analyzing or planning change: understanding the type of change, the context for change, leadership, and agency, and the approach to change. Kezar also highlights the critical importance of change agents, which she emphasizes include leaders at all levels of the organization. While these studies and frameworks reveal important factors that shape efforts to implement curricular and instructional innovations, they offer little by way of how those who champion and lead successful efforts engage these factors, build relationships, and implement innovation in a way that enables scaling.

Prior research has attended to the work of implementation, namely in the context of curricular reform and policy shifts. Previous studies of the enactment of new policies in community colleges reveal the varied ways that staff on campuses implement those policies. For example, Brower et al. (2017) surfaced a typology of policy implementation behaviors in Florida as the state dramatically reformed developmental education in community colleges. They found that those responsible for implementing policy engaged in four kinds of implementation behaviors: 1) direct opposition to policy implementation; 2) circumvention of policy implementation; 3) satisficing so as to meet the bare minimum requirements for the policy; and/or, 4) facilitation of policy implementation by

reorganizing or reconstructing existing work to accommodate the policy. Their inductive study revealed that opposition was the most common response to the reform of developmental education in community colleges, highlighting the challenges to implementing policy within institutions.

Chase et al. (2021) examined department chairs' sensemaking of large-scale pathways reform in a large community college, focusing specifically on department chairs due to their crucial role in implementing policy (Kezar, 2013). Chase and colleagues found that department chairs' descriptions of the pathways reform effort fell into three types: surface-level, where department chairs enthusiastically endorsed the reform but did not appear to understand the details of the reform and what it would entail; student-focused, where department chairs viewed the effort primarily as a way to provide special services to students, largely leaving faculty instructional practices and departmental routines untouched; and practitioner-focused, where department chairs understood that pathways reform would require significant changes to their own practice and the work of their faculty to implement the pathways reform. This practitioner-focused type of reform aligns with what Kezar refers to as second-order change (2018). Similarly, Sowl and Brown's (2021) study of a large-scale, system-wide pathways reform effort revealed that faculty were oppositional to major curricular and instructional reform because decisions were made without their consultation, threatened their autonomy, and demanded changes to their instructional practices that they did not deem necessary. Both studies (Chase et al., 2021; Sowl & Brown, 2021) highlighted the delicate and micropolitical nature of large-scale curricular and instructional reform, motivating a call for shared governance with faculty echoed by community college researchers (e.g., Kater & Burke, 2022).

We aim to build on these insights by understanding *how* leaders engage in shared governance when seeking to implement and scale curricular and instructional innovation in community colleges. The studies above make visible the enabling and constraining factors for scaling curricular and instructional innovations, but offer less by way of understanding *how* those on the ground engage, navigate, or are constrained by these factors. Our study does not aim to articulate another set of broad ideas about what leaders can and should do, but instead seeks to illuminate the *practices* that leaders engage in to scale curricular and instructional innovation.

Theoretical framework

To understand the leadership work around scaling CMP, we viewed the work of leadership as being made up of *practices*. Specifically, we sought to unveil how leaders shaped the implementation and scaling of CMP, including how they both supported and advanced implementation and scaling efforts, as well as constrained or limited those efforts. We conceptualize *practices* as situated and situating actions, viewing context and agency as recursive and inseparable in practice and only separable analytically and theoretically (Feldman & Orlikowski, 2011). Central to a practice theoretical frame is viewing individual action and organizational structure as mutually constitutive rather than discrete and separable. In this frame, organizational structure constrains and enables action, while action simultaneously (re)produces, modifies, upends, or disrupts organizational structure. Additionally, practice theory conceptualizes organizational structure as meaningfully and effortfully produced through action (Tsoukas & Chia, 2002). Rather than viewing organizational structure as stable, disembodied, and divorced from action we view organizational structure as dynamic and constantly produced.

Thus, we focus this study on the situated *actions* leaders took – regardless of whether those actions limited or enabled efforts to scale – to offer practical insight into the specific moves leaders make in relation to scaling curricular and instructional innovations. We specifically examine those actions within the context of organizational structures – organizational policies, procedures, and routines at the institution that provide context for action, and that are also produced and engaged through action. An organizational policy, for example, may be a rule at an institution stipulating that developmental education coursework must not be required to enter college-level coursework. An organizational procedure might entail existing standard processes, such as a process for having a course approved at a community college. Finally, organizational routines are patterned actions that individuals maintain,

such as a regular meeting time among math faculty in a department to discuss department-wide issues. We attend closely to how leaders respond to and interpret these structures through action – in particular, action in relation to efforts to scale CMP.

By conceptualizing and aiming to unveil practice in this way, we generate insight into CMP implementation and scaling efforts that brings together: a) the organizational factors that scholars have identified as crucial for implementation and scaling of curricular and instructional reform efforts and innovation; and b) the individual leadership moves made by those on the ground to advance those efforts. We also aim to generate insight that is practical, enabling those responsible for leading and leadership development to attend to practices that they can aim to develop and foster with effort and coaching.

Methods

The SUNI project sought to examine CMP implementation and scaling efforts at three postsecondary institutions: two community/technical colleges and a four-year research university. For the purpose of this study, we focus on leadership practices at the two community and technical colleges given their commonalities as postsecondary institutions. Additionally, the two institutions represented contrasting cases of CMP implementation: Northern Technical College (NTC), which successfully scaled CMP to over 17 sections within the college, and Southern Pacific Community College (SPCC), which, after a decade of attempts to scale CMP, ultimately chose to abandon CMP altogether. Contrasting these two cases helped us to identify the varied practices that leaders at the institution engaged with, whether or not those practices led to successful or failed attempts at scaling.

Additionally, each college underwent significant curricular and instructional reform as they sought to implement and scale CMP. Northern Technical College implemented a large-scale, college-wide pathways reform, while Southern Pacific Community College was faced with complying with Legislative Bill (LB) 505, a statewide bill that required that community colleges stop requiring developmental coursework before students can take college-level courses. We attended to the ways in which leaders at each institution engaged with these reforms to constrain and enable CMP scaling efforts, highlighting the ways in which they implemented these policy shifts with CMP in mind.

Data collection

To gain insight into leaders' practices in the context of CMP implementation and scaling efforts, we conducted semi-structured interviews with institutional interest-holders involved in CMP at their respective institutions. These interviews focused on their implementation and scaling efforts and asked leaders to discuss the challenges, barriers, and successes they experienced in implementing CMP, as well as key moments that shaped implementation and scaling efforts. Interview lengths were nonstandard but typically took about 60 minutes. We conducted these interviews over the course of several years, from 2018 to 2022. Over the life of the project, we conducted multiple interviews with five institutional leaders at NTC – the mathematics department chair, a dean, and three faculty members. At SPCC, we also conducted multiple interviews with five institutional leaders – the mathematics department chair, the president of the college, a student advisor, a dean, and a faculty member.

We also collected artifacts related to CMP implementation and scaling efforts from institutions. These artifacts included planning documents related to CMP adoption and adaptation, student success and enrollment data in CMP courses, and documents outlining their strategy for CMP implementation and scaling. These artifacts provided insight into the progress of their scaling efforts.

We also conducted and collected data on four annual project meetings and three site visits with leaders at the institutions – two in-person site visits with NTC and one virtual site visit with SPCC. These meetings took place with a range of interest-holders at the institution, and aimed to get a broad view of how implementation and scaling efforts were unfolding. In these meetings, the research team took field

notes and collected audio recordings. Institutional leaders were asked to reflect on their progress toward scaling and to articulate what they were doing to advance scaling efforts at their institutions.

Institutional leaders also were assigned leadership coaches as part of the SUNI project. These coaches worked closely with leaders, advising them on key decisions and obtaining regular updates on the challenges and successes of scaling efforts. Coaches took notes on their individual meetings with leadership coaches and shared them with the research team. Occasionally, the research team conducted interviews with coaches to better understand leaders' progress and actions. The research team also occasionally attended and took notes during steering committee meetings, where faculty, staff, and others involved in CMP implementation met to check in on challenges with the course as the term was ongoing.

Analysis

We began our analysis by using interviews with leaders and coaches, artifacts, and notes from meetings to generate narrative institutional memos pertaining to leaders' efforts to implement and scale CMP, paying close attention to the stories that leaders told to substantiate the memos with evidence. The narratives served as a way to gain broad insight into the ways implementation and scaling unfolded, highlighting the moves that leaders made in relation to scaling efforts, drawing on Langley's (1999) analytic approach to using narratives to analyze process data. We then generated three comprehensive institutional memos, one for each college, highlighting the key interest-holders at the institution, their history with CMP, major institutional shifts since CMP implementation, their attempts at scaling CMP, and the number of sections and students who enrolled in CMP by term. These memos were first generated near the beginning of the SUNI project and were updated annually with new information about implementation and scaling efforts. They were also shared with leaders at the institutions to solicit their feedback on the memos and details about the implementation at multiple points throughout the project.

To surface leadership practices related to scaling efforts, we reviewed the narrative memos and generated additional analytic memos (Saldaña, 2013) concerning actions taken by institutional actors to implement and scale CMP. These memos helped us to identify and pull out the actions leaders took and reflect on the ways in which those actions were constrained and enabled by organizational structures at the colleges. Analytic memos also offered reflections of what leaders could have done differently, an analytic move in practice theory to highlight the agency of actors and illustrate how their actions are constrained and enabled by structures (Giddens, 1984).

From there, we used the memos to identify actions and key related interview segments describing CMP implementation efforts in which the identified actions featured prominently. The segments were then process coded (Saldaña, 2013) to focus on how these actions impacted implementation and scaling efforts. We then reviewed the codes, collapsing them based on their affinity to one another, ultimately generating four categories of codes. We then reviewed each category, specifically attending to the ways in which leadership moves were both situated in and situating institutional policies, structures, and routines, and generating short analytic memos on each of them. After reviewing the code categories and our memos, we identified two central leadership practices that appeared to meaningfully shape implementation and scaling of CMP.

Findings

Analysis surfaced two tightly intertwined leadership practices related to implementation and scaling efforts: tracking and leveraging. By *tracking*, we refer to how leaders attend to and assess institutional priorities, policies, relationships, and routines to identify opportunities to encourage or limit implementation and scaling efforts within their institutions. We note that this tracking is active in nature; rather than passively monitoring a set of indicators to assess the health of an institution, leaders were actively, and on an ongoing basis, attending to relevant priorities, policies, relationships, and routines

across the college with an eye toward shaping implementation and scaling efforts. Leveraging refers to how leaders used those same institutional priorities, policies, relationships, and routines to advance or limit CMP implementation and scaling. We found that tracking surfaced institutional structures and processes that leaders could leverage to constrain and enable scaling efforts. In some cases, institutional structures, policies, and processes appeared to limit the extent to which CMP could have been scaled but were then co-opted to advance scaling efforts; conversely, some institutional structures appeared to be opportunities to support scaling but instead were used to limit it.

Below, we illustrate how tracking and leveraging played out in relation to scaling efforts at NTC and SPCC and the ways in which leaders engaged in these practices in order to advance or limit scaling efforts. We first highlight how tracking and leveraging unfolded at NTC to successfully implement and scale CMP, then turn to the case of SPCC, highlighting how tracking and leveraging work there diminished the college's capacity to scale CMP and ultimately lead to the dissolution of CMP at SPCC altogether.

Tracking and leveraging at Northern Technical College

We begin by highlighting tracking and leveraging practices at Northern Technical College, a technical college in an urban city in the midwestern United States. A majority of NTC's student population are students of color and have experienced long standing disparities in success rates in mathematics courses.

We focus on the practices of the mathematics department chair, Theo, given his championing of CMP and his responsibility for creating conditions that enabled CMP scaling. Although other leaders at NTC advocated for CMP, Theo served as the primary champion for the program from its inception through the earliest scaling efforts. Theo also recruited others to champion CMP, and those leaders continued efforts to scale CMP at NTC after Theo stepped away to focus on other responsibilities as department chair.

Theo learned of CMP from a colleague at a nearby institution during the 2017–2018 school year and found the model intriguing. In interviews, he remarked that the CMP model was similar to how he had taught before, specifically mentioning that he appreciated the way the curriculum prioritized “investigation-type work” over mathematical rules and procedures. However, Theo elected not to attempt to bring CMP to NTC at the time as he felt that it “would not have fit” among the other mathematics courses. Importantly, Theo pointed out an institutional policy that would have prevented the course from being implemented and scaled at that time:

At our school, they only allow us to offer a course if a program adopts it as their graduation requirement. [...] I think that would have been part of our discussion too, because we aren't allowed to just [say] Hey, let's do [CMP] now. We have to go to [a] program and a program has to say they are going to adopt that class and then it can be offered.

We viewed this as an instance of Theo engaging in the work of *tracking*. Though Theo had expressed affinity for CMP, he was also attending to the various policies and the course landscape at NTC that could hinder his ability to scale CMP. Though he could have attempted to bring CMP to his college immediately, Theo instead took a more cautious approach given where the institution was at the time.

The context shifted in the 2018–2019 academic year when NTC began the process of eliminating developmental coursework as part of their adoption of Guided Pathways – an institutional change framework that attempts to respond to the incoherent, incohesive, and often confusing nature of support services and courses in community colleges by providing students with structured guidance in selecting and completing courses (Bailey et al., 2015). Theo viewed this college-wide shift as an opportunity to bring CMP to NTC and believed that once developmental education requirements were removed at NTC – including many mathematics courses whose course objectives overlapped with CMPs – CMP would be a “natural fit.” Theo also commented that the shift to Guided Pathways

forced programs across the college to evaluate and potentially modify course requirements, creating an opportunity to introduce CMP to the college.

Every program was meeting [...] to redo their [course] mapping. They had to look at what courses they were requiring because they were really asked to start looking at all of the programs within one pillar [to support Guided Pathways]. [Each program] should try to have similar beginning courses and so that if a student wants to switch to a different one, they are not told, Sorry, everything you took doesn't count. So they all rewrote what they would have.

In this situation, Theo was closely tracking not only his institution's shift to Guided Pathways, but also what would be required of programs to enact Guided Pathways. Theo recognized that programs would undergo remapping of their course sequences, providing an opportunity for him to pitch CMP as a possible course requirement to one or more programs. Theo's understanding of others' work serves as an example of how he engaged in tracking to find opportunities to implement and scale CMP.

Theo's tracking enabled him to engage in the practice of *leveraging* by taking advantage of relationships, institutional policies, practices, structures, and routines. Theo not only attended to the shifts resulting from the removal of developmental courses but also found a way to take advantage of this shift in order to frame CMP as a possible course requirement for programs. Using existing relationships within the institution, and his position as math department chair, in fall of 2018 (well ahead of full Guided Pathways implementation), Theo targeted the school's Culinary Arts program:

Theo: We couldn't offer it until Culinary Arts accepted it. So we went to Culinary Arts and said, We have got this class, we would like to offer [CMP] and it is going to be something without a prerequisite and your students will be able to take it. And they said they would take it before it was officially their course.

[...]

Author 2: Why did you decide on Culinary Arts?

Theo: Because [...] Carrie, one of the higher level administrators, [was close with] the department chair for Culinary Arts. Carrie was with [me] and for the Guided Pathways meeting. She was on board with that and then Carrie talked to [the department chair] and got him onboard with CMP and so then we went in and she connected us that way.

Theo *leveraged* his relationship with and connection to Carrie to find an opportunity to bring CMP to NTC, using his colleague's close connection to the Culinary Arts department to ensure that CMP could be offered as a course requirement for a program. Theo also tracked the kinds of mathematics that the Culinary Arts department felt their students needed and built his knowledge of these mathematical needs during his time as mathematics department chair. Theo *leveraged* what he knew about various departments' mathematical needs in order to sell them on CMP. He also *leveraged* his knowledge of institutional policies and structures to ensure that CMP was in place at NTC prior to the full Guided-Pathways implementation that occurred in Fall 2020. According to NTC's SUNI coach,³ Theo's tracking work regarding course needs and his leveraging of his role as department chair enabled him to sell the program to program directors. Theo remarked to his coach that he would tell department chairs, "this is your solution. This allows students to gain mathematical competence. This is what they need." She also remarked that Theo "did a great job of selling CMP" to program directors across the college.

Theo's close *tracking* work coupled with his work on *leveraging* his role, his relationships, institutional practices, policies, structures, and routines enabled him to more effectively "sell" CMP to a range of other departments as well. In the first semester of CMP implementation (fall 2019), NTC offered just two sections, enrolling a total of 27 students. By fall 2021, NTC offered 14 sections of CMP, enrolling 226 students. Our analysis of Theo's scaling work at NTC revealed that the careful, deliberate tracking and leveraging work to bring CMP to the institution in ways that attended closely to its policies, structures, and practices enabled Theo to effectively scale CMP. In particular, Theo's tracking ability allowed him to connect his scaling efforts with aspects of the institution, including those that, on their face, seemed like barriers, such as the policy that all new courses must be required for

graduation in at least one NTC program. This work required extensive knowledge of the institution and rapport with several college interest-holders at different levels, all of which were then leveraged in this scaling work.

We now turn to a contrasting case, that of Southern Pacific Community College, to highlight a situation where a leader engaged in tracking and leveraging in ways that were not conducive to scaling efforts.

Tracking and leveraging at Southern Pacific Community College

Southern Pacific Community College is a large, suburban community college on the west coast that is a majority Hispanic-serving institution. SPCC joined the SUNI project in the 2018–19 academic year amidst drastic changes resulting from LB 505, a statewide bill prohibiting community colleges from placing students into developmental education courses as prerequisites for college-level courses. Prior to and through this policy shift in the state, SPCC had implemented Statway at a small scale – from two to four sections and around 100 students per term – for nearly a decade. The work of tracking and leveraging for the scaling and implementation of CMP unfolded across a wide range of roles and members. We highlight four key interest-holders within SPCC that played a role in efforts to implement and scale CMP in **Table 1**.

The two most recent presidents of the college were both vocal advocates for Statway, with the current – Benjamin – opting to work closely with the SUNI project team to support SPCC’s scaling efforts and bringing in Sam, the faculty member and CMP champion that had been teaching Statway at the college since it was first offered in 2010. Despite their advocacy, Sam’s and Benjamin’s efforts to sustain and scale Statway were tumultuous from the outset. A number of other mathematics faculty expressed skepticism and opposition to scaling the course due to how it was introduced and sought to ban Statway from the college several times. After fall 2014, SPCC never offered more than five sections of Statway per term. In this section, we highlight how *tracking* and *leveraging* practices in early Statway implementation constrained leaders tracking and leveraging practice eight years later, limiting efforts to scale and ultimately leading to SPCC removing Statway as a course option from the college in 2019.

Although data collection and analysis for this study began in 2018, later interviews with SPCC interest-holders between 2020 and 2022 revealed that early moves to bring Statway to the college generated significant opposition to CMP among many math faculty members. Victor – a faculty member in the math department at the time of Statway’s introduction who later took over as SPCC’s math department chair – described how the president introduced Statway to the college:

The president [Joseph] at the time had made an agreement to bring Statway into SPCC. [...] The math department was not very fond of the fact that the agreement was made without our consultation and so there was a lot of pushback regarding the model. Because why are we being told to teach, you know, something that we never researched or decided that we want to do.

According to Victor, bringing Statway to SPCC in this way generated “distrust” – that, although this was ten years ago, the department had “a long memory” and the skepticism toward the Carnegie Math Pathways was “lingering.” In discussing how Statway was introduced to SPCC, Sam (the faculty champion) noted that in community colleges in his state, faculty have purview over the curriculum

Table 1. Key SPCC interest-holders and accompanying roles

SPCC interest-holder	Role
Sam	Long-time math faculty member and the faculty CMP champion at SPCC.
Joseph	Served as president of SPCC until 2011. Originally introduced Statway to SPCC.
Victor	SPCC mathematics department chair. When Statway was introduced, Victor was a faculty member.
Benjamin	SPCC president at the time of this study. Took over in 2011 and was committed to the implementation and scaling of Statway at SPCC.

they teach; while the college's board "rubber stamps" faculty curriculum decisions, they do "follow the decisions we make." Victor agreed with this interpretation of the process.

We interpreted these moves by former President Joseph as implying that he saw Statway as a promising innovation and used his position and significant influence to bring it to the college. That is, Joseph was *tracking* the promise of the innovation and *leveraging* his position within the institution to mandate implementation of Statway. We also highlight here what Joseph did *not* track – how math faculty view their roles and their culture of autonomy and agency around curriculum, and the processes of approving curriculum and faculty members' role in that process. Victor described how these moves created an environment of resentment among math faculty toward Statway; although Joseph later clarified that the math department faculty could assess and change the course to fit their priorities, animosity toward Statway remained as a result of its introduction.

The president of SPCC at the time of the SUNI study, Benjamin, took a similar approach to his predecessor in agreeing to participate in the SUNI project. Benjamin remarked to Statway's faculty champion at SPCC, Sam, that he aimed to make Statway the "default support course for students that need statistics." Sam remarked:

I told him, right then and there, that that was unrealistic. And that it probably will never happen. And yet we proceeded with that as our goal.

Sam commented that SUNI should instead focus on filling the sections that SPCC already offered. Benjamin chose not to take this advice, instead engaging in similar tracking and leveraging practices as former President Joseph – tracking the success of Statway and leveraging his position to scale it. Meanwhile, Sam's tracking included attending to the environment within the math department that constrained Benjamin's ambitious goals; Sam recognized that because of the opposition to CMP within the department, making Statway a default course was unrealistic. Though both SPCC Presidents were deeply committed to improving student success in mathematics at the college, the ways they engaged in tracking and leveraging ultimately constrained any future Statway implementation and scaling efforts. Attempting to bring CMP to SPCC without close collaboration with math faculty at the institution instead created opposition to Statway.

In his role as mathematics department chair, Victor also engaged in tracking and leveraging in ways that constrained efforts to scale CMP, situated within and framed by this environment of opposition to CMP. Although Victor expressed an affinity for Statway, stating "I think it's a really great model for students because it's the type of collaboration that works for them," he felt that "the well was poisoned" at SPCC regarding Statway and "there may be other faculty that might be willing to take a look at it," but that Statway within the math department as a whole was still a "tough sell:"

I try to do whatever I can for Sam when it helps, but I have to respect the wishes of the department when they tell me to do something. So when the department tells me, You've got to tell [CMP] to back off [...], it's like, Okay, I'll do it, but it may not necessarily be what I feel. But I have to respect the department's wishes. That's what the department wants me to do.

Victor reiterated that he was personally fond of Statway – "the pedagogy behind Statway is effective and I've really liked what it does." Still, he largely stayed away from attempting to build will among faculty or engaging in concerted efforts to scale the initiative. We viewed these comments from Victor as instances of him *tracking* the math department faculty's attitudes toward Statway (general opposition, though some faculty might have been "willing to take a look"), and *leveraging* his role as department chair and these insights into faculty attitudes to advocate for the department's wishes and abstain from scaling efforts.

We found that Victor also leveraged LB 505 and the subsequent work it required of SPCC's math department to constrain Statway implementation. As a result of LB 505, the mathematics department decided to reorganize their college-level courses to add co-requisites. Victor, the department chair, remarked that adding a co-requisite in the form of a two-credit course would enable students who "may not feel completely ready" to receive proper support. These co-requisites were added to all

existing college-level math courses except Statway, which existed prior to LB 505 as a two-course, year-long sequence where Statway I included algebra content and Statway II was a college-level statistics course. As a result, the department chose to eliminate Statway I.

Victor: Students would be allowed to directly enroll into the Statistics portion of the Statway course. So they would no longer need the Algebra portion of the two part Statway model, so they wouldn't need Statway I, they could go directly into Statway II.

However, other pre-college-level algebra courses would remain:

Victor: Here at SPCC, however, the math department felt we wanted to make sure that we remain a community college so we decided not to eliminate our Pre-Algebra, our Beginning Algebra, or our Intermediate Algebra courses. So we are going to maintain those courses as well.

These actions can be interpreted as instances of tracking and leveraging to limit the capacity of Statway to scale at SPCC. In particular, Victor and other mathematics department faculty tracked LB 505, what additional mathematics support students might need without developmental mathematics prerequisite courses, and the resulting course reorganizing processes. They also leveraged this resulting work and what they knew about what supports students needed mathematically to exclude Statway while continuing to offer other developmental mathematics courses and creating support for other college-level courses offered by the department. We highlight Victor's tracking and leveraging practices to constrain Statway scaling by illustrating what he could have done otherwise. For example, Victor could have worked to garner buy-in among math faculty to maintain Statway's status through LB 505 implementation, as opposed to representing math faculty members' interest in limiting Statway's ability to scale. We note, however, that while there were alternate courses of action that Victor could have taken to advocate for Statway at SPCC, he also likely would have done it at great risk to his position within the department given the collective animosity toward Statway among math faculty.

As a result of the math department excluding Statway from their shift to a co-requisite model in response to LB 505, Sam decided to redesign Statway II to include additional content from Statway I in order to support students who needed additional mathematics support. Because the course was redesigned, Sam had to receive approval from faculty as if it were a new course.

Sam: When I put up the new [Statway] course for a vote in my department, somebody asked for a vote on whether they should shut the whole program down or not. Which was very frustrating. And we held that over two meetings because it was a big issue, and a difficult one. And I was allowed to give a final argument before they took the vote, and we did a private vote so that nobody's feelings would be hurt, and after the private vote we won by one vote.

We interpreted these instantiations of tracking and leveraging from Victor (and other mathematics faculty) as a collective effort to constrain or outright eliminate Statway implementation at SPCC. In contrast to Theo's efforts at NTC, Victor (acting on behalf of the math department, though not personally) was actively opposed to CMP, and so in order to limit scaling, he leveraged his position as chair and the introduction of LB 505. Although Victor had expressed affinity for Statway, he ultimately chose to frame his role as department chair as doing what "the department wants me to do" – that is, limiting Statway's scaling at the college.

We end our discussion of SPCC by discussing the tracking and leveraging work of Sam, the most consistent champion for CMP at the school. For a decade, Sam had attempted to maintain and scale Statway within SPCC. Sam had consistently tracked oppositional attitudes toward Statway, describing several members of the department as "paranoid" about outside interference and control over SPCC curricula. Because of this, he approached the SUNI project with narrowly defined goals, such as advertising Statway to fill existing sections in the college's schedule of classes. Sam tracked the environment at SPCC and leveraged this environment to advocate for a narrower, more achievable goal for participation in the SUNI project. Ultimately, however, Benjamin did not leverage Sam's knowledge of the math department culture, and, instead, chose to continue to prioritize making

Statway the default college-level math course. Sam's positioning at the college did not enable him to leverage his knowledge of the department's opposition to shape the direction of scaling efforts.

Two years after joining SUNI, Benjamin, Sam, and others involved in the SUNI project chose to opt out of participating in the project. In the spring of 2021, SPCC faculty voted to remove Statway as an offering at SPCC, ending implementation and scaling efforts at the college.

Tracking and leveraging during catalytic events across institutions

A catalytic event unfolded at each college shortly before it became involved in the SUNI project. At NTC, executive college leadership decided to reorganize the college according to the Guided Pathways model, while at SPCC, LB 505 was being implemented statewide. Our analysis revealed that institutional leaders engaged in tracking and leveraging around these catalytic events that both constrained and enabled CMP scaling efforts.

NTC's leveraging of Guided Pathways to enable CMP implementation and scaling is a central part of the story of introducing CMP to the college. For Theo, the move to Guided Pathways presented an opportunity. Theo *tracked* the course remapping and reorganization work as an opportunity to both introduce and implement CMP as degree requirements in certain programs in the institution. He also tracked the course options that would be removed that would enable successful implementation and scaling of CMP, remarking that “[developmental] math going away” at NTC created a window for CMP as programs were seeking new courses to replace developmental mathematics courses. Theo, an advocate for CMP, *leveraged* these reorganization processes that were brought on by the shift to Guided Pathways to sell CMP to programs and *leveraged* his position as department chair to influence the math department to support implementation.

At SPCC, LB 505 served as a way to further limit future scaling efforts, enacted through leaders' tracking and leveraging of shifts brought on by this legislation. Much like NTC's move to Guided Pathways resulting in major course reorganizations, so too did LB 505 demand course reorganization at SPCC. This course reorganization was taken up as a way to limit Statway implementation and required its faculty champion, Sam, to take on the burden of ensuring Statway was compliant with LB 505, an effort he took on alone. While the math department and the Department Chair (Victor), sought to reorganize courses to ensure that other pre-college courses would continue to be offered after LB 505, he did not extend this effort to ensuring Statway would also continue.

We cast a light on leaders' responses to these two catalytic events at NTC and SPCC to illustrate how leaders tracked and leveraged two comparable events – both of which required a significant course reorganization – to in one case constraint and in the other enable CMP implementation and scaling. They also serve to highlight the complex and complicated ways that leaders *track* and *leverage* what is unfolding at their institutions to advance their own and others' priorities, which are constructed moment-to-moment. For example, although Guided Pathways emerged as an institutional priority at NTC, Theo leveraged this to prioritize CMP implementation within the college as well; at SPCC, fulfilling the requirements of LB 505 emerged as an institutional priority and was leveraged to limit Statway's implementation and scale.

Discussion

Our study sought to answer two research questions: 1) What leadership practices shape the implementation and scaling of a curricular and instructional innovation within community colleges? , and 2) What leadership practices emerged in successful and unsuccessful efforts to scale these innovations? In relation to the first question, our study surfaced tracking and leveraging as central practices that community college leaders engaged in to shape scaling efforts of a promising, evidence-based mathematics pathways initiative within their colleges. Leaders' tracking and leveraging practices shaped and were shaped by the implementation environments – leaders tracked and leveraged major policy shifts to constrain and enable efforts to scale, while efforts to scale shaped how major policy shifts came to be implemented. This

finding motivates a need to attend more closely to *how* leaders advance or limit the scaling of these initiatives. Examining *how* leaders do their work generates lessons for how other institutional actors can track opportunities to scale and leverage existing organizational structures – such as institutional policies, priorities, relationships, and routines – to support scaling. We seek to advance conversations *away* from simply centering the need for leadership to champion efforts and attend to context, and *towards* unveiling *how* leaders champion and *how* they (re)shape and draw on context.

This finding around tracking and leveraging practices contributes to existing literature about addressing the challenge of scaling promising initiatives in community colleges, where effective initiatives are frequently implemented as “boutique” programs (Asera et al., 2013). Asera and colleagues’ framework for scale in community colleges offered a comprehensive and useful approach to organizing efforts to scale, highlighting the importance of (1) engaging interest-holders and building relationships to plan; (2) identifying early adopters and establishing scaling infrastructure; (3) incorporating new interest-holders and fostering ownership over initiatives locally; and (4) engaging in evaluation and promoting culture change. Our study builds on this framework by illustrating the moves that leaders make within components of Asera and colleagues’ framework – for example, *how* leaders at Northern Technical College engaged colleagues across departments to advance the scaling of the Carnegie Math Pathways. Our study also builds on this framework by surfacing how leaders engage existing priorities within departments and at the college more broadly to constrain and enable efforts to scale.

In relation to our second question about the practices that emerged around successful and unsuccessful efforts to scale, we found that leaders did not engage in different practices, but instead engaged in tracking and leveraging toward the different aims of constraining or enabling scaling of curricular and instructional innovations. In the case of one college, leaders tracked and leveraged policy shifts and resulting work as a result of those policy shifts to better position curricular and instructional innovation to scale. In the case of another college, leaders tracked and leveraged similar policy shifts to limit the scaling of the same innovation.

Our findings around the second question contribute to conversations about shared governance and collaborative leadership in postsecondary institutions, and community colleges in particular. Kater and Burke (2022) have highlighted how shared governance – in the form of garnering buy-in and establishing trust with colleagues and other interest-holders – is a central feature of community college leadership, especially as it pertains to institutional change and reform. Our study illustrates *how* community college leaders come to engage in shared governance (or not) and how leadership moves constrain and enable efforts to scale promising initiatives within the institution. We build on the claim that garnering buy-in is important by illustrating *how* community college leaders garner buy-in for scaling promising initiatives, primarily by attending to and drawing on emerging and existing institutional and departmental priorities. Our study also highlights how garnering buy-in to scale initiatives comes to be constrained by prior leadership actions, where leaders who do not engage in shared governance can construct long-term opposition to the initiative. Another key takeaway is the role of faculty leaders in the shared governance model. College presidents and other administration leaders are not the only interest-holders who must garner buy-in; mid-level leaders must do so as well. Thus, it is critical that the definition of “leader” be expanded to include all faculty participating in the collaborative leadership of the institution.

These takeaways regarding buy-in are consistent with research on implementing curricular and instructional innovations in postsecondary institutions as well. Foote et al. (2016) and Shadle et al. (2017) reveal the importance of collaborating with faculty and administrators to garner buy-in and attend to the cultures of the institutions to support curricular and instructional innovation. Sowl and Brown (2021) revealed the rationale for faculty opposition to major curricular and instructional reform, making visible that such efforts threaten their autonomy. This was consistent in our study, where faculty opposition emerged due to threats to their autonomy. We build on this finding by highlighting what leaders did in relation to faculty opposition, revealing that leaders at SPCC tracked and leveraged this opposition to constrain efforts to scale CMP.

Our study also reveals how the work of tracking and leveraging was deeply contextual, where the institutional and individual priorities, as well as institutional policies, priorities, relationships, and routines, come to shape what it is that leaders tracked and what it is they chose to leverage. Existing postsecondary research has outlined that leaders ought to attend to organizational structure—e.g., institutional priorities, policies, and routines – in order to successfully implement and scale promising innovations (Asera et al., 2013; Kezar, 2013; Macdonald et al., 2019; McPhail & McPhail, 2020). However, our unveiling of leadership practices highlight how leaders do so, and how they do so to limit and advance scaling efforts alike. Rather than viewing “context” as separate and discrete from practice, our study reveals how leaders effortfully constructed institutional and departmental priorities in relation to scaling curricular and instructional innovation. For example, in the case of NTC, scaling CMP was made a priority and the implementation of Guided Pathways was recruited to focus on that priority. Meanwhile, at SPCC, CMP had been deprioritized due to long-standing faculty opposition; LB 505 was recruited, then, to emphasize other courses and specifically to continue to push CMP to the margins of the department. To date, constructs such as institutional context and institutional goals and priorities have been discussed as static, often positioning scaling and innovation efforts as needing to fit inside of these goals and priorities (e.g., Asera et al., 2013). Our study highlights how some of these priorities were generated through leadership efforts to scale. Despite its importance, we view a close examination of how priorities came to be established as existing outside the scope of this particular study; future research might examine how priorities come to be effortfully established, upheld, pushed down and pulled through, and modified.

Based on our findings, we recommend that those responsible for leadership development in community colleges carefully attend to supporting leaders at all levels in developing a repertoire of practices that include the work of tracking and leveraging. We envision professional learning activities that build the capacity of faculty and administrative leaders in developing a broader view of the institution, including an understanding of existing institutional policies, procedures, and routines. We also imagine that professional learning activities can center around helping leaders reframe institutional policies, procedures, and routines as sites and opportunities for change and transformation so that they can leverage them. Our study revealed how similar policies can be tracked and leveraged to both constrain and enable innovation, highlighting the possibilities for leaders to see barriers as potential levers for change.

One final takeaway from this study is the critical importance of faculty as mid-level leaders. Theo and Victor held that role as department chairs, but research into faculty change agents also demonstrates that leadership is often informal and can also be leveraged to achieve scale (Eddy et al., 2021). Consider, for example, how scaling efforts at SPCC may have unfolded if the college president had chosen to leverage the faculty champion’s knowledge and tracking of the math department by empowering him into a role of leadership for the Statway scaling. We posit that such a move is consistent with prior research on empowering faculty change agents, in which faculty change agents make the successful implementation of policy and innovation more likely (Macdonald et al., 2019). Our study highlights cases in which faculty were engaged in different ways, making long-lasting impacts on scaling efforts.

Limitations and directions for future research

While this study surfaced important leadership practices that constrained and enabled scaling of an evidence-based math pathways reform at two community colleges, it also illustrates the critical importance of institutional context. To that end, we highlight how this study examines just two community college contexts – we envision that other practices may emerge in contexts outside of these. Future research should consider examining leadership practices in other community college contexts and whether and how tracking and leveraging emerge in those settings, particularly in relation to scaling.

Though coaching was a major component of the SUNI project, the study reported on in this paper did not examine the role of coaching, how it was taken up, and how coaching shaped leadership

practices. Future research should examine the extent to which coaching supports the development of these and other practices. Relatedly, we view this paper as a start to building a knowledge base of leadership practices and how leaders come to develop those practices. For example, we envision future work focusing on helping leaders develop tracking practices by designing learning experiences aimed at helping them see and analyze existing and emergent priorities and policies of their institution and its departments. This builds on work by Iverson et al. (2020) around providing leadership development to STEM faculty to develop wider views of the institution. We envision future research on scaling that complicates the practices of tracking and leveraging or surfaces new and different practices leaders might engage in to advance or constrain scaling efforts.

Although this study closely examined the work of mid-level leaders, it does not centrally interrogate the role and practices of mid-level leaders exclusively, nor does it call into question the boundaries between “mid-level” and “top-level” leadership. We believe deeper investigations into the role of mid-level leaders as change agents and how their positioning affects their ability to leverage is warranted. Prior research has revealed the importance of mid-level leadership (e.g., Eddy et al., 2021; Macdonald et al., 2019), but our study motivates the need to examine what moves mid-level leaders engage in, and the ways in which institutional context is tightly connected to those moves.

We also argue for more research into the practices of top-level leaders. Our study began to unearth how top-level leaders’ actions shaped the work of mid-level leaders as they sought to scale curriculum initiatives at community colleges. Close examinations into top-level leadership practices fell outside the scope of this study, but their moves played central roles in constructing a context for scaling efforts. A closer look at these top-level leadership roles is sorely needed to offer additional insight into scaling innovation and reform.

Our study reveals the importance of and motivates the need to attend to *how* leaders and interest-holders within community colleges shape efforts to scale promising innovations. Studying practice in this way can make visible what moves leaders should develop and how those moves sit within complex and shifting institutional contexts.

Notes

1. High School students are also eligible to enroll under specific programming such as Dual Enrollment.
2. AAUP Research Office: <https://data.aaup.org/academic-workforce/>
3. SUNI coaches are experts with significant community college administrative experience who provide guidance to institutional leaders for scaling CMP.

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