A FACULTY-LED EFFORT TO BUILD CAMPUS COMMUNITY AROUND INCLUSIVE EXCELLENCE IN STEM

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O ver the last 5 years, we have worked with many other faculty, staff, and administrators to grow a university-wide program to transform how we welcome 1st-year STEM students to campus, the region, and their academic disciplines. In this chapter, we first describe our campus context and the development of our programming. Next, we articulate the conditions that we feel gave rise to a shared leadership approach and some of the methods we used to work with a relatively horizontal leadership structure. Finally, we describe challenges and lessons learned, including recognition of missteps along the way that we hope sharing our story may help others avoid.

Campus Context

The conditions of Humboldt State University (HSU) are similar to those of many other institutions, yet the setting is also unique. In line with the national trend in higher education, the number of HSU students who are from a cultural background traditionally underrepresented on college campuses and/or are first in their family to attend college has been steadily increasing. These students, now referred to as the new majority by the American Association of Colleges and Universities, the Howard Hughes Medical Institute, and others (Schneider, 2005), has increased from 19% of

the HSU 2009 student body ($n = 7954$) to 40% of the 2019 student body ($n = 6983$). Furthermore, many arrive from distant urban centers in Southern California (700–800 miles away) and the San Francisco Bay Area (300–400 miles away), places that are environmentally, economically, and culturally quite different than rural Humboldt County, California, which is both predominantly non-Hispanic White (approximately 75%; U.S. Census Bureau, 2010) and home to nine federally recognized American Indian tribes. The campus itself sits on the ancestral lands of the Wiyot, who have called the Humboldt Bay region of Northern California home since time immemorial. As the only California State University (CSU) campus situated among a large Indigenous population, American Indian scholar Vine Deloria, Jr. recognized HSU as "absolutely unique within the California State University system" (Deloria, 1989, p. 2).

HSU has a long tradition of providing support for new majority students, particularly for Native students. Beginning in 1969 with the founding of the Indian Tribal and Educational Personnel Program (ITEPP), just 3 years later, the Native American Career Education in Natural Resources (NACENR) was established to train Indigenous students for professional resource management positions in American Indian communities, federal and state government agencies, and the private sector. In 1991, the mission and programming of NACENR expanded and evolved into the Indian Natural Resources, Science and Engineering Program (INRSEP), which is still in existence today. With new upper administrative leadership and the shifting student demographic, HSU expanded the model of providing academic support in a cultural context in 2012 with the establishment of several cultural centers for academic excellence, designed to promote the individual and academic advancement of all students in a culturally welcoming environment. Despite these efforts, data from our campus continued to indicate that the campus struggled to help students from diverse backgrounds develop the self-efficacy, academic behaviors, and the sense of belonging necessary for academic achievement, particularly in the disciplines of science, technology, engineering and math (STEM). Even as late as 2015, HSU's 4-year graduation rate for incoming students majoring in STEM was 10% overall, 4% for students from traditionally underrepresented ethnicities, and 8% for first-generation students. The rapidly shifting student demographic demanded new practices and a disruption of the status quo, creating an opportunity for leaders to offer and organize a vision for change that spanned academic and student affairs divisions.

Student learning communities are time-tested high-impact practices (Kuh, 2008) that can bridge academic and student affairs. The term *learning community* is used for many different education strategies, but here we

define it as a curricular approach that intentionally links a cluster of two or more courses around an interdisciplinary theme and enrolls a cohort of students (Smith et al., 2009). Although preliminary ideas for a learning community model were hatched in 2011 when HSU's then-provost sent a cross-disciplinary team to the National Summer Institute on Learning Communities at The Evergreen State College, efforts to launch a learning community stalled. In 2014, a competitive funding opportunity by the CSU system created an opportunity to pilot experimental 1st-year reforms specifically for incoming students in STEM, known as the CSU STEM Collaboratives project. We took this opportunity to pilot place-based learning communities (PBLCs) for first-time 1st-year STEM students.

Our PBLC was designed by faculty, staff, and off-campus communities to include five strategies shown to be effective in increasing diversity in STEM: (a) a summer immersion experience, (b) a major-focused 1st-year seminar, (c) peer mentors, (d) block-scheduled courses, and (e) integration of linked programming in the division of Housing and Residence Life. By designing the associated assignments and activities around scientific and social themes of our unique location, students examine how multiple disciplines can be marshaled to solve challenging social, environmental, and cultural issues faced by people from all places ("grand challenges"). Through an interdisciplinary curriculum connected to social and student support programs, we hoped to foster a sense of community and belonging for 1st-year students that enables them to see how their own life experiences relate to new peoples and landscapes, and empower them to quickly self-identify as young scientists in their discipline. We also hoped that if students could recognize the relevance of basic introductory science courses to pressing civic and environmental issues, they would be motivated to excel in their coursework and retain in STEM.

Why a Shared Leadership Approach?

When the CSU launched the STEM Collaboratives program, they did it in a manner that demanded a commitment to institutionalization. This was such a priority that the call for proposals was circulated specifically to CSU campus administrators. It was a casual conversation with the HSU Sponsored Programs Office that alerted us to the opportunity. As two STEM faculty members with shared interests in interdisciplinary education; a passion for empowering students from diverse backgrounds; leadership experience with undergraduate training programs (NSF REU, NSF URM, HHMI, LSAMP, and CIRM Bridges); an eye for external funding

opportunities that could be leveraged to advance inclusive student success; and a history of collaboration to advance such efforts, we immediately identified the potential. We presented a proposal to pilot a PBLC for first-time 1st-year students majoring in the natural resource and biological sciences to our dean and vice provost. They gave us the green light to work with the HSU-sponsored programs director to submit a proposal. Along with seven other CSU campuses (Kezar & Holcombe, 2017), HSU received funding, and preparations to launch our first pilot learning community began in earnest in spring 2015.

We worked with faculty, staff, and partners from the Karuk and Yurok Tribes to design a PBLC focused on environmental and social justice issues of the Klamath River Basin, an area strongly associated with our region. Since the initiative was grounded in curricular improvements and emerging best practices in STEM education, it was essential to incorporate new ideas that would engage faculty and propel change in academic affairs. At the same time, the scope of the program required diverse leadership from multiple campus departments and divisions in student support services as well as partnerships with scientists, cultural practitioners, and leaders of our local Tribal nations. We were fortunate to be working in a climate where improving student academic outcomes, especially for students from historically minoritized backgrounds, was a campus priority. This allowed us to quickly assemble a core leadership team composed of faculty from multiple academic departments, leaders of student success initiatives in student affairs, HSU administrators, and Tribal partners interested in improving outcomes for their communities.

Our hope was that if there was sufficient evidence that our pilot PBLC was improving student academic outcomes, retention, and graduation rates, university administration would support the transformation of the 1st-year experience to include a PBLC for all STEM students. As the culture of scientific research promotes collaboratively developed experimental designs tested by multiple laboratories of related disciplines, we instinctually took a horizontal approach to leadership that began with a collective visioning of the project that included rigorous assessment. We then reached out to assessment professionals in student affairs (then called Office of Retention and Inclusive Student Success) and HSU's Office of Institutional Effectiveness (then called Institutional Research) to identify the metrics we should use to assess various dimensions of the program. This resulted in efficient real-time analyses that produced preliminary evidence that the program was helping 1st-year STEM students achieve a sense of belonging and retain in the program into their 2nd year. These data coupled with the

overwhelmingly positive experiences reported by the Klamath Connection community of faculty, staff, administrators, and Tribal partners generated the collective will required to not only continue but grow the program.

Our leadership team partnered extensively with the dean of our college and department chairs to refine a vision that was ultimately financed by two external grants (U.S. Department of Education Title III Hispanic-Serving Institution grant and HHMI Inclusive Excellence award). As the programming grew, we established a steering committee composed of key administrators, staff, and a few faculty, and we created subgroups responsible for different dimensions of the project. By employing a distributed leadership model, the design and implementation of the PBLCs benefited from the expertise of individuals who specialized in a wide range of areas including first-time student experiences, housing, tutoring, registration, library resources, Native American studies, and different STEM disciplines relevant to local scientific, environmental, and social justice issues. Five years and literally hundreds of participants later, all first-time 1st-year students in the HSU College of Natural Resources and Sciences have the option to participate in a PBLC.

Building Capacity

Growing from an opt-in pilot program in 2015 for 63 students in specific majors and funded exclusively by an external grant to a program with five opt-out PBLCs for all incoming STEM 1st-year students (approximately 400 students) funded predominantly by the institution by fall 2021 required building support and capacity quickly and across many areas of the institution. Our approach involved incremental growth in the number of people involved, a comparatively horizontal leadership structure, establishing communities of practice, forming a steering committee comprised of key administrators, and a deliberate "hump shape" in staff and financial support.

Our work began with hiring a single staff person whose role spanned design, implementation, communication, and clerical duties. We grew to include additional staff, dividing responsibilities accordingly, peaking with four full-time and one part-time staff members, while shifting most design responsibilities to faculty teams. The first staff person hired has remained with the program through all phases, and their role has been elevated to a PBLC director. The growth trajectory of staff paralleled the increase in learning communities, which were added at the rate of one per year: Stars to Rocks (for chemistry, physics, and geology majors) in 2017, Rising Tides (for marine biology and oceanography majors) in 2018, Among Giants

(for biology, botany, and zoology majors) in 2019, and Representing Realities (for math and computing science majors) in 2020.

In order to plan the design and implementation of each new PBLC, a lead faculty member was identified to serve as a faculty coordinator by the project principal investigators (PIs), the PBLC director, PBLC staff, and the deans of the college. The faculty coordinator received approximately a full course release each semester of the academic year prior to the launch of the PBLC so they would have the time to plan the program. The faculty coordinator's first duty was to identify campus and off-campus partners to join the full PBLC planning and development team. In most years, their work began at the National Summer Institute on Learning Communities at The Evergreen State College a full 15 months before welcoming their first cohort of students. Attending these institutes achieved the immediate objective of educating and empowering the PBLC team to build the foundation from which they would design the activities and curriculum associated with their theme. Once a new learning community was launched, the faculty coordinator continued to receive release time. The rest of the team of faculty were able to claim pay for the hours spent running the program.

The regular meetings of the PBLC teams helped bond each group together and establish a commitment to pursuing the lofty goals of cohort-based, academically themed learning communities. As PBLC team members continued to work together in subsequent years, "communities of practice" coalesced around a shared vision of implementing a PBLC and bonding over the triumphs and challenges therein. As cross-PBLC subgroups emerged around specific dimensions of the program (e.g., summer immersion, 1st-year experience, service learning, culturally responsive pedagogical practices), additional communities of practice began to emerge. These were all connected through periodic events that brought everyone involved in the PBLCs together to build community. In the beginning, we hosted "happy hour" social gatherings for faculty, staff, and administrators. These first events were not intended to discuss much content or make decisions; rather, their tone was social and aimed at celebrating the initiation of the project and some its earliest success. As a sense of community grew and the work enlarged, we began to hold periodic retreats to share data, discuss progress, and strengthen the community. Over time, these sessions evolved to also include discussing important themes like Native American Traditional Ecological Knowledge or student inclusivity in field settings. Initially these events were organized mainly by PIs. Once the practice was established, this responsibility shifted to PBLC staff and key faculty. Five years later, the PBLCs are run by seven faculty coordinators working with staff in a largely horizontal and dispersed leadership model. With this expansion in leadership, our role as PIs in

designing and implementing the PBLCs has significantly retracted; we are now focused more on institutionalization, staff supervision, and assessment and dissemination.

We invited key administrators to join the PBLC development teams at The Summer Institutes for Learning Communities so they could learn about the potential of learning communities to meet vital institutional goals of retention and inclusive student success and be partners in covisioning the future of the program. This increased understanding of learning communities as a high-impact practice coupled with the perspective of administrative leadership enabled fairly rapid adjustments within university divisions essential for the success of our program (enrollment management, communication, facilities, registrar). These administrators and others were invited to be part of a steering committee that would meet regularly to discuss the progress of the program, review evidence of effectiveness, coach us through difficulties, and guide us toward a model the campus could ultimately sustain.

The incremental growth in work, people, and costs was designed to be *hump shaped*, meaning growth should be rising in early years, peak in middle years, and diminish in the last years of a 5-year grant-funded timeline, owing to both a relaxation of work as the program evolved from a "develop & design phase" to a "sustain phase," and to a gradual shift in the ratio of funding from external grants and institutional support. This design has been partially successful, and with approximately one more year of primary external funding, more work is needed to operationalize sustainable, less costly structures, including a reduction in faculty workload and staff support. Institutional financial backing has indeed risen each year, and staff support is scheduled to diminish as we shift from a broad and robust assessment plan involving research and external dissemination to a smaller assessment plan aimed at internal monitoring of data for a continuous improvement cycle.

Throughout this work, the two of us have held coleadership roles. Many early one-on-one meetings and traveling together to conferences afforded time and discussion to cooperatively arrive at a shared vision and, to some extent, workstyle. As noted earlier, this coleadership model emerged organically for us, and may have arisen partly out of a STEM culture of co-PIs who work on a shared research project as equal partners, with which each of us had prior experience before launching this education reform effort. We cowrote all three grant proposals (CSU STEM Collaboratives, HSU STEM, and HHMI) and technically split the lead directorship of the two larger grants between us, which provided some distinction of responsibilities and division of labor. But generally, most of our collective work has been entirely shared. As every professor who has cotaught a course understands, this design can help improve the product, but it often also means

extra labor. Fortunately (or unfortunately, depending perhaps on perspective), we each committed to the tremendous time and effort the initiative has demanded.

Challenges and Lessons Learned

In our experience, it is rare for faculty to lead institutional change at the university level. While we knew this was not common practice, in our situation it seemed appropriate because the PBLCs were developed to foster community around academic discipline. We also believed faculty leadership would result in rich interdisciplinary and cross-cultural programmatic development with the depth and attention required to implement best practices in STEM education: innovative curricular design, culturally responsive pedagogical practices, and increased participation in experiential learning and research. Another goal was for program participants to cultivate a deeper sense of belonging with the greater HSU community that would ultimately lead to increased retention and academic achievement. Finally, we hoped these curricular reforms would result in meaningful personal, academic, and professional cross-cultural engagement that would assist participating students in developing an intercultural knowledge of Indigenous environmental, scientific, and cultural issues.

Achieving these outcomes required robust partnerships within existing academic departments, campus divisions, and our local Tribal communities. Our intention was to work together to covision and implement the Klamath Connection program with these partners. However, because our vision for the PBLC was grounded in building community around shared academic interests, we neglected to fully educate ourselves on the complementary efforts in campus divisions responsible for providing infrastructure that supports student success outside the classroom. These included the Educational Opportunity Program (EOP), freshman orientation, housing and residence life, academic advising, enrollment management, the learning center (tutoring and supplemental instruction), retention through peer mentoring, the cultural centers for academic excellence, the registrar's office, financial aid, and the library, which was undergoing its own transformation to provide more holistic supports to student education. In our enthusiasm to "improve" STEM students' 1st-year experience, there were times we did not acknowledge the expertise that dedicated professionals in each of these divisions had gained through their experiences working with HSU's first-time students. Were it not for their willingness to collaborate and educate us on the best practices in student support they employed, the PBLCs could not have been successful.

We also learned that our professional culture was more unique to academic scientists of our disciplines than we were aware. The manner in which we were accustomed to communicating with other faculty sometimes complicated conversations with staff and university administrators, who have slightly different professional communication styles. The academic method of multitasking between teaching and research could make it challenging for our dedicated staff to navigate our management style and timelines, which could be confusing, unclear and, in the worst cases, disrespectful. We also discovered that differences in disciplinary-specific language could complicate interactions among the PBLC faculty. For example, when educating Klamath Connection students about the role of nitrogen in the toxic algal blooms of *Microcystis aeruginosa* in the reservoirs behind the Klamath dams, it became clear that the term *limit* has a very different meaning for mathematicians and biologists. The biology faculty were using it to describe the concept of a limiting factor (Liebig's law of the minimum), or the component responsible for determining the amount of cell growth/division that could occur in the system. Our math faculty first interpreted it to mean *inhibit*, meaning if you add more nitrogen, the growth would not increase and would possibly diminish.

Perhaps the most important lesson we have learned is to ensure that the goals of all collaborators are considered when developing programmatic objectives. Six months after the launch of the Klamath Connection pilot, we began hearing concerns that the program was not in the best interest of Native American students nor our local Tribal collaborators. Student and administrative leaders in campus HSI initiatives publicly questioned why the program didn't include programming specifically to support our rapidly growing Latinx student population. Some administrators have been critical, identifying examples that demonstrated our insufficient attention to equity and cultural humility. Student testimonials regarding the microaggressions that occur from faculty to student and among students raised additional concerns about the attitudes of STEM faculty. Through continuing conversations with leaders from each of these groups as well as colleagues working to increase equity in higher education at other institutions, we restructured our approach to include stakeholder voices in the development and expansion of the PBLCs and companion professional development programming. Although we are still working to improve these dimensions of the program, our place-based curriculum has evolved so that it gives credence to the epistemological traditions of the Native people of our region, and the activities have broadened to include community service work to benefit our local Tribal communities. We are working more collaboratively with student support staff, students, and the campus

Hispanic-Serving Institution Steering Committee to identify specific needs of Native American, Latinx, and other students historically underrepresented in STEM so we can continue to improve our programming. PBLC faculty now have a better understanding of Indigenous ways of knowing, culturally responsive pedagogies, and some of the barriers faced by students and faculty of color, including the reality of systemic racism and settler colonialism in Western STEM traditions.

If we had taken more time to learn from our partners early on, develop behavior norms for communication, and understand everyone's motivations for participation, we could have avoided many of these issues. Perhaps we would have been more considerate had we not been driven by the timeline imposed by the grants funding our work. We have learned that sometimes the pace required to achieve grant deliverables can be too aggressive for collaborative efforts toward institutional change. Fortunately, we received extensive mentoring in academic leadership and cultural responsiveness through the program directors and mentors associated with two of the funding agencies that supported our work. The CSU STEM Collaboratives was guided by leading experts in higher education innovation, including all four editors of this book. Similarly, the AAC&U Inclusive Excellence Commission was a partner in the development and implementation of the HHMI Inclusive Excellence initiative. Both funders organized participants into learning communities and prescribed regular meetings for grantees that afforded the opportunity for professional development and community building. The relationships we have built among our peers and workshops focused on catalyzing institutional change (Elrod & Kezar, 2016) and Multicultural Organizational Development (MCOD; Jackson, 2006) have helped us develop the self-awareness required to recognize shortcomings in our leadership styles and provided us with some tools to help us address them.

We are now in year 6 of the 7 years the three grants provided to reform the STEM student experience at HSU. As we complete the final years of this project, we find ourselves navigating the transition from externally funded capacity-building to programmatic institutionalization. Since the majority of the grant dollars were dedicated to capacity-building, we are fortunate in that much of the design and implementation of the PBLC components has been completed. However, to date external grant expenses have only modestly declined, and transitioning to a sustained phase with few changes from the previous year's programming has proved elusive even for the longest running PBLCs. Recent efforts to move out of designing and into sustaining programming were complicated by the COVID-19

pandemic. The unexpected pivot to a virtual format required substantive program revision even for the more experienced teams. Our hope is that a no-cost extension on at least one of the 5-year external grants may afford additional time to achieve the sustainable structure and its corresponding reduced workload and costs.

We recognize that the university may have difficulty supporting the totality of our program as they seek to implement orientation programs for other groups of students arriving at HSU for the first time, including non-STEM 1st-years and transfer students. We are hopeful the essential elements of our robust curricular design will be maintained. The final phase of our work will require a new set of collaborations across divisions to identify the aspects of our program most critical to the improved outcomes we have described (Johnson et al., 2017; Johnson et al., 2020) and what will still be required to realize additional gains in student success, especially for historically minoritized groups in STEM. Although not an insignificant challenge, we believe the improved campus collaborative spirit coupled with an increased faculty awareness of the student experience, renewed administrative appreciation of faculty dedication to student success, and deeper relationships with our Tribal collaborators will help us find a way to institutionalize the PBLC model. More importantly, we believe this work has laid the foundation for future campus efforts to improve inclusive excellence not only in STEM education, but throughout multiple dimensions of university life.

Chapter 5 Reflection Questions

1. As you studied this case, did you see any new ways to approach shared leadership in a more equitable and socially responsible way on campus and, where appropriate, within the broader community?
2. What cross-disciplinary and community-based connections do you have now that you could draw upon to support a shared leadership approach?
3. Shared leadership draws differently upon existing institutional capacity. Are there lessons for you in the ways that HSU built the capacity to support their initiative? What resources do you already have that can support this approach to problem-solving and action?
4. This case offers insights into how the experiences of leaders affects how shared leadership unfolds. Who will be working together to lead your own project, and what can you learn from this case that might be useful as you learn how to work together with people who may see issues through a different frame than you do and who may have different goals?

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