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## Place-Based Learning Communities on a Rural Campus: Turning Challenges into Assets

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# Place-Based Learning Communities on a Rural Campus: Turning Challenges into Assets

## Abstract

At Humboldt State University (HSU), location is everything. Students are as drawn to our spectacular natural setting as they are to the unique majors in the natural resource sciences that the university has to offer. However, the isolation that nurtures the pristine natural beauty of the area presents a difficult reality for students who are accustomed to more densely populated environments. With the large majority of our incoming students coming from distant cities, we set out to cultivate a “home away from home” by connecting first-year students majoring in science, technology, engineering and math (STEM) to the communities and local environment of Humboldt County. To achieve this, we designed first-year place-based learning communities (PBLCs) that integrate unique aspects and interdisciplinary themes of our location throughout multiple high impact practices, including a summer experience, blocked-enrolled courses, and a first-year experience course entitled *Science 100: Becoming a STEM Professional in the 21st Century*. Native American culture, traditional ways of knowing, and contemporary issues faced by tribal communities are central features of our place-based curriculum because HSU is located on the ancestral land of the Wiyot people and the university services nine federally recognized American Indian tribes. Our intention is that by providing a cross-cultural, validating environment, students will: feel and be better supported in their academic pursuits; cultivate values of personal, professional and social responsibility; and increase the likelihood that they will complete their HSU degree. As we complete the fourth year of implementation, we aim to harness our experience and reflection to improve our programming and enable promising early results to be sustained.

## Cover Page Footnote

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## **Perspective and Issue**

Humboldt State University (HSU) is the most isolated of the 23 campuses of the California State University (CSU) system and one of the most northerly Hispanic Serving Institutions (HSIs) on the West Coast. The campus is located in a region of California with a large indigenous population, and it services nine federally recognized American Indian tribes. It is academically unique, offering an atypical blend of disciplines with a strong emphasis and enrollment in science, technology, engineering and math (STEM) majors. The surrounding area is more rural than nearly all other four-year institutions in California, and its spectacular natural setting in coastal redwood forest is a signature of the university.

Our academic programs, stunning landscapes, and beaches are a powerful draw for students, but, for too many, our biggest strength becomes our biggest weakness when the reality of our remoteness is realized. The largest groups of students come from metropolitan centers in Southern California (30%, 700-800 miles away; >10 hr drive by car) and the San Francisco Bay Area (13%, 300-400 miles away; >5 hr drive by car), areas very different from Humboldt County.<sup>1</sup> The campus is located in the City of Arcata (population of 18,000), where activities common in cities and familiar cuisines are sparse or nonexistent. The local population is predominantly non-Hispanic White (~75%) (U.S. Census, 2010), but Humboldt State's incoming student classes more closely resemble the statewide profile than local demographics. When homesickness sets in, travel options are limited, unreliable, and unaffordable, making weekend visits home impractical for most. First-year students often choose Humboldt because they are looking for a new experience but are usually unaware of the magnitude of change ahead and how pronounced the distance to home will seem as they try to adjust to college. Historically, this has contributed to significant opportunity gaps in first year science and math courses, low retention into the second year, and a reduction in graduation rates.

### **Place-based Learning Communities as a Solution to The Problem**

We have developed Place-Based Learning Communities (PBLCs) to better welcome and support first-year STEM students. A large body of evidence identifies the importance of psychosocial and study skill factors as predictors of student success (Pascarella & Terenzini, 1991; Covington, 2000; Eccles & Wigfield, 2002; Robbins, Lauver, Davis, & Carlstrom, 2004; Weiss, Visher, Weissman, & Wathington, 2015; Permzadian & Crede, 2016). Self-efficacy has emerged in multiple studies as a strong predictor of student motivation,

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<sup>1</sup> All campus data comes from the HSU Office of Institutional Effectiveness.

development of study habits (MacPhee, Farro, & Canetto, 2013), and learning (Richardson, Abraham, & Bond, 2012). Additional studies demonstrate that students' academic and social validation, a sense of belonging/community, and meaningful cross-cultural engagement are essential for improving academic outcomes of first year students, particularly for those from minoritized backgrounds (Tinto, 1993, 2012; Rendon, 2004; Museus, 2014). Learning communities that provide educationally purposeful activities within and outside of the classroom are linked to a variety of outcomes beneficial for college students, including enhanced student engagement, learning, academic performance, and personal development (Tinto & Goodsell, 1993; Shapiro & Levine, 1999; Zhao & Kuh, 2004; Brownell & Swaner, 2010; Otto, Evins, Boyer-Pennington, & Brinthaup, 2015). Therefore, our PBLCs were designed to integrate related social, environmental, civic, and cultural themes of our region into foundational STEM coursework to root students simultaneously in their discipline and into the local communities and landscapes.

The HSU PBLC structure includes multiple high-impact practices, including a summer immersion experience and block-scheduled classes; one of these is a first-year experience course designed to foster interpersonal and academic development (Kuh, 2008; Rendon, 2004). All participants are assigned a peer mentor and are given the option of living together in PBLC themed on-campus housing. Students are grouped by major so that those with similar academic interests participate in a series of shared hands-on, cross-cultural experiences within and outside of the classroom that cultivate relationships with peers, faculty, scientists, and the local community. The activities and assignments are designed to promote student gains in many of the essential learning outcomes identified by the American Association of Colleges & Universities (AAC&U) LEAP initiative, including inquiry and analysis; critical thinking; written and oral communication; quantitative literacy; information literacy; teamwork; civic knowledge and engagement; intercultural knowledge; integrative learning; and foundational skills for life-long learning (AAC&U, 2007). Our intention is that by providing a cross-cultural, validating environment, students will feel—and be—better supported in their academic pursuits, cultivate values of personal, professional and social responsibility, and increase the likelihood that they will complete their HSU degree.

Each of our PBLCs examine interdisciplinary themes of the local area through the lens of the academic majors they serve. The first HSU PBLC, *Klamath Connection*, was an optional program launched in 2015 for 65 first-year STEM students majoring in Biological Sciences, Environmental Science, Fisheries Biology, Wildlife Biology, or Zoology. There are now four PBLCs serving HSU STEM first-year students: *Klamath Connection* (serving first-year students with majors of Environmental Science and Management, Environmental

Resources Engineering, Fisheries Biology, Forestry, Rangeland Resource Sciences, and Wildlife Biology), *Stars to Rocks* (Chemistry, Physics, and Geology), *Rising Tides* (Oceanography and Marine Biology), and *Among Giants* (Biology, Botany, and Zoology). When the department of Math and Computer Science launches its PBLC in Fall 2020, all first-year students entering the College of Natural Resources and Sciences will participate in a learning community unless they choose not to.

Our place-based design combines multiple components (i.e., Summer Immersion, blocked courses, dorm life, support services, non-curricular activities, and in some cases a Linked Project) that emphasize the connection to place and the interconnectedness of disciplines—from physical sciences, life sciences, and natural resource management to politics, sociology, Native American studies, and the arts. The themes and activities specific to each PBLC are the product of the work done by each PBLC team, whose members include HSU faculty and staff in partnership with government officials and members of the local Native American tribes (i.e., Yurok, Karuk, Wiyot, Hoopa, Trinidad Rancheria, and Blue Lake Rancheria). After crafting each PBLC, many of these team members continue as instructors and/or activity leaders during the entire first academic year. For example, all first-time freshmen majoring in Oceanography or Biology with Marine emphasis participate in the *Rising Tides* (RT) PBLC, which has two themes: the science of outer coast and estuarine ecosystems and the current and past relationships of indigenous peoples to these two seascapes. The student experience in this PBLC starts during Summer Immersion. During these three to four days, members of the Wiyot Tribe and Trinidad Rancheria welcome students and, by using active learning approaches, start the process of educating students about local indigenous cultures. Students' understandings' of the two RT themes are further expanded during Summer Immersion by a library exercise for which students have to do research and give a short presentation on each theme. A Linked Project, which tests hypotheses about water quality conditions and phytoplankton community structure in each ecosystem, is also initiated by the students during Summer Immersion. Importantly, both themes are revisited during the courses and activities across the entire first year, which are directed by marine science faculty and faculty who are Native American. For example, the Linked Project is further developed during the Fall semester introductory Oceanography course, and then again during the Spring semester Critical Thinking course. The topics of Native American history, social justice, and Traditional Ecology Knowledge (TEK) are studied during the spring semester Native American studies course; for the Critical Thinking course, the RT students have to write an argumentative essay on the roles of Western Science and TEK in enabling marine conservation. Each of the PBLCs uses a similar approach to ensure that their themes are expanded upon in the particular set of courses taken by their students,

which include the lab science courses required for their major, a math course, an English or communications course, a Native American Studies course, and the first-year seminar Science 100.

### ***Science 100: Becoming a STEM Professional in the 21st Century***

Fostering community, belonging, and a sense of self-efficacy requires deliberate attention to both a growth mindset in curricula as well as activities that are academically and socially validating (Rendon, 2004; Perzmadian & Crede, 2016; Wibrowski, Matthews, & Kitsantas, 2016). The first year course, *Science 100: Becoming a STEM Professional in the 21<sup>st</sup> Century* (SCI 100), is the central component of each PBLC. The primary objectives of the course are to support student understanding of self, success, and science. As each SCI 100 section is linked to a specific PBLC student cohort, the course also serves to coordinate assignments and activities related to the interdisciplinary theme across the block-scheduled fall semester courses. Following recommendations from a review of first-year seminars (Padgett & Keup, 2011) and best practices for serving first-year minoritized college students (Rendon, 2004; Museus, 2014), SCI 100 connects students to diverse student services like the Learning Center, Tutoring Center, the Office of Financial Aid, the Health and Wellness Center, the Cultural Centers for Academic Excellence, and the Indian Natural Resources, Science and Engineering Program (INRSEP). Learning objectives associated with scientific vocabulary and scientific methodologies are included so that the students develop skills required to succeed in their classes, begin to foster a scientific identity, and prepare for their entry into the STEM workforce. Teaching faculty emphasize how the interdisciplinary, cross-cultural themes introduced during the summer immersion are connected with subsequent first year courses. Because HSU recognizes SCI 100 as a 3-unit Lifelong Learning General Education requirement (Lower Division Area E) of the CSU system, this course advances students toward their degree.

To develop SCI 100, PBLC faculty and staff first identified learning objectives (Table 1) to meet the learning goals of both the PBLC and those of the California Lifelong Learning General Education requirements. They then collaborated with campus divisions<sup>2</sup> and community partners<sup>3</sup> to identify curricula

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<sup>2</sup> The campus collaborators included the Centers for Academic Excellence (African American, Latinx, Multicultural, Native American), Scholars without Borders, Indian Natural Resources, Sciences and Engineering Program, Learning Center, Career Center, Registrar, Library, Wellness Center, Financial Aid, Student Disability Resource Center, and Student Health/Wellness Services.

<sup>3</sup> The majority of our community partners are scientists, cultural experts, and other employees of the Karuk, Yurok, Wiyot, Trinidad Rancheria, Blue Lake Rancheria, and Hoopa Native American tribal governments. Other partners include STEM professionals from the State and Local Parks, medical and engineering communities, and research scientists from other universities.

and resources to meet these objectives, especially in supporting student personal and professional development, areas in which most STEM teaching faculty are not experts. A foundational syllabus was designed and shared across all SCI 100 sections so that student introductions to campus resources occurred at the most relevant time in the semester and would minimize the overscheduling of campus staff. For example, class visits by financial aid specialists and academic advisors coincided with the FAFSA and course registration deadlines; presentations by Wellness Support Service staff occurred during times of the semester observed to be the most stressful for students; support for classes (exam preparation and evaluation) was given before the first exam in students’ block-scheduled science course. Coordination across SCI 100 sections allowed us to embed key signature assignments for assessment and evaluation across class sections.<sup>4</sup> Examples of the latter include weekly journal entries, summer immersion reflections, and a research poster assignment that illustrates how students’ major discipline is related to scientific issues with social consequences (e.g. climate change).

**Table 1: Learning Objectives for Science 100**

1. Students will be introduced to their home department, the College of Natural Resources and Sciences, the University and the surrounding area. They will build relationships with faculty and students from their home department and will create a broad community of peers, mentors and resources to support them during their time at HSU.
2. Students will connect and engage with academic and self-development campus resources. Through guest speakers, workshops and on campus resource visits, they will be empowered to seek resources independently.
3. Students will advance their academic and emotional resilience.
4. Students will be introduced to what it means to be a scientist. Through reading popular and technical writing in their field they will develop their critical thinking skills
5. Students will be able to formulate their goals as a future professional in their chosen major. Students will evaluate their strengths and weaknesses as student-learners.
6. Students will gain appreciation for and understanding of an expanded world perspective by engaging with other students, staff, and faculty within and outside their field.
7. Students will develop confidence and communication skills to culture a professional mindset and skill set. Through this, students will evaluate the meaning of scholastic and humanistic success and form a better understanding of their target career path.
8. Students will be introduced to appropriate use of scientific vocabulary (e.g., observation, organization, experimentation, inference, prediction, evidence, opinion, hypothesis, theory, and law).
9. Students will learn to use print and electronic resources, including the World Wide Web, in preparing for an investigative activity.
10. Students will communicate the steps and results of a scientific investigation in both verbal and written formats.

<sup>4</sup> Signature assignments are being assessed using modified versions of the LEAP Value rubrics.

## **Reflections**

We are in the fourth year of the Humboldt State PBLCs. Assessments to date suggest the initiative has been successful in cultivating community, reducing opportunity gaps, increasing university retention, and supporting student growth in core competencies (Johnson, Sprowles, Overeem, & Rich, 2017).<sup>5</sup>

Students who participate in our PBLCs self-report a greater sense of belonging, are more likely to be retained after their first year, and have greater academic success in foundational STEM courses when compared to paired non-PBLC first-year students in the same major. Preliminary analyses of student essays indicate that students better understand the relationships among STEM courses and are able to connect content to intercultural themes (e.g., aspects of their culture and the cultures of local indigenous people). Furthermore, students express seeing value in understanding topics from multiple perspectives, as well as the importance of multidisciplinary approaches to science. In addition to benefitting students, the process of developing the PBLCs has strengthened relationships and created partnerships for others at HSU. Rarely have faculty from different departments and resource staff worked this closely to develop an integrated curriculum with the common goal of supporting students. The scale of these collaborative partnerships with Native American faculty, staff, and the people of our regions are unprecedented and have laid the foundations for improving support of Native American students, specifically.

Science 100 has not only played a central role in the PBLCs at HSU, it has been part of a campus-wide initiative to increase student success and enhance efforts that support a diverse student body; provide and deliver student support in a culturally sensitive and effective way; reduce redundancy; optimize timing of delivering content; and increase engagement with student support services. The efficacy of the SCI 100 component of the PBLCs to address student learning objectives is being evaluated via the review of the signature student assignments, anonymous student course evaluations, and informal observations of students and faculty. Although it is too early to draw conclusions through formal assessments, some important strengths and challenges have emerged. Many students found a supportive community in SCI 100 and made meaningful connections with resources on campus. They felt connected to the faculty instructors and welcomed the opportunities to meet invited guests that the class provided. Almost universally, students valued activities designed to connect them with their major department and chosen discipline. In fact, many voiced a desire for more scientific content in the curriculum. One of the most meaningful experiences in SCI 100 was the culminating poster session. Students rose to the challenge to

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<sup>5</sup> The results of assessments, including those of signature assignments using modified versions of the LEAP Value rubrics, will be discussed in two additional articles, currently in preparation.



study and research a scientific issue, to work together as a group, to learn valuable research and communication skills, and to present their scientific poster during a PBLC-wide poster session. Most posters included explicit connections to social issues, which helped illustrate the relevance of science to society. This observation suggests we may be better able to reach a broad range of students by underscoring the interconnectedness of science and social and environmental challenges, thereby contesting the narrative that STEM fields are inconsistent with the values of social justice or communal goals (Riegle-Crumb, King, & Irizarry, 2019).

While such evidence demonstrates our PBLCs are improving the sense of academic belonging and positive academic outcomes for many students, other observations reveal that there are still improvements to be made in making the HSU first-year college experience more inclusive and equitable. One of the main challenges for PBLC faculty is to effectively support and engage students who vary widely with respect to college readiness. Although opportunity gaps in first-year gateway courses are closing, we have worked to refine our programming to improve the performance of students from economically and socially disadvantaged backgrounds. In the SCI 100 course, the range of student engagement and performance noted by faculty suggest that the diversity of student needs makes it more challenging than expected to develop curricula that are effective for all students, a common challenge for first-year seminars (Barefoot & Fidler 1996; Ryan & Glenn, 2004). Given the widespread enthusiasm for the scientific content in the class, we plan to revise the curricula using discipline-specific academic goals as the lens through which the discovery of self and success is viewed.

Finally, participant testimonies remind us that HSU students continue to face institutional barriers to their success—at the university, in the classroom, among their peers, and within the greater HSU community. We are working closely with our colleagues in Student Affairs to explore these issues and have launched collaborative efforts with HSU's Office of Diversity Equity and Inclusion, HSU's Center for Teaching and Learning, and ESCALA Educational Services to improve the campus climate and enhance our culturally responsive teaching.<sup>6</sup> By continually re-examining evidence of effectiveness and implementing new strategies designed to create a more inclusive community, we are optimistic that the HSU PBLCs will improve our ability to effectively welcome, support, and ground all of our first-year STEM students so that they are able to gain the social confidence and academic skills necessary to achieve their personal and career goals.

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