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A Place-based Learning Community: Klamath Connection at Humboldt State University

Abstract
A place-based learning community called *Klamath Connection* was designed to improve the academic performance of freshman in Science, Technology, Engineering, and Math (STEM) majors at Humboldt State University, a midsize public institution in a location geographically and culturally unfamiliar to the majority of its students. The program interweaves four high impact practices demonstrated to improve the success of students in STEM: a summer immersion, freshman year seminar, modified gateway courses, and peer mentoring. Each component is linked by an interdisciplinary theme unique to our geographic location and central to the communities that live within it, the Klamath River basin. This manuscript describes the local background and needs assessment that initiated the program, explains our hypothesized model that a place-based learning community can foster the sense of belonging, skills, and habits that favor academic success, and reviews the design and implementation of our pilot program that launched in 2015 for 63 first time students entering HSU. We conclude by describing lessons learned from informal and formal assessments of participating faculty, staff, and administrative personnel that have prompted modifications to the model, which is currently being expanded to serve all entering STEM majors by 2020. Analyses describing the effects of the program on student attitudes, academic performance, and retention in the university will be reviewed in a subsequent manuscript.

Keywords
Learning communities, first year experience, peer mentoring, STEM, place-based, community, Native American, underrepresented, first generation

Introduction

Learning communities[1] have the potential to improve student outcomes through several mechanisms (Weiss, Visher, Weissman, & Wathington, 2015). Strong peer-to-peer connections are built when students are co-enrolled into two or more courses (Smith, MacGregor, Matthews, & Gabelnick, 2009). If the course content is linked, students better understand connections and relationships among disciplines (Klein, 2005). When the community is designed to connect social and student support programs to the curriculum, relationships between faculty and students are strengthened and participants experience a greater level of engagement with campus life and academic identity (Tinto, 2003).

Over the last twenty years, much research has suggested that learning communities have a positive effect on student outcomes (Weiss et al., 2015; Zhao & Kuh, 2004). If, as hypothesized, the students who gain the most from learning communities are those who partially disconnect from their previous community as they transition to college, campuses with largely residential and full-time student populations may benefit most from this pedagogical strategy (Weiss et al., 2015). However, as some critics have noted, learning communities may not be inappropriate for students of some cultures and/or for campuses with large commuter populations because of the difficulties of balancing school with a distant community and home. When campuses draw from these populations, they are challenged to cultivate a sense of belonging (Cabrera, Nora, Terenzini, Pascarella, & Hagedorn, 1999; González, 2002; Guiffrida, 2006).

Cultivating the sense of belonging required for academic integration while honoring connections to familial homes and traditions is especially challenging and important for campuses that attract students to locales unlike that of their families (Guiffrida, 2006). One approach posited to balance these simultaneous needs is "place-based education." A term often associated with pre-collegiate and outdoor education pedagogical literature, place-based education connects students to the region of study, provides cultural and/or geographic context to lessons, and usually involves outdoor education methodologies (Gruenewald & Smith, 2014). Although the concept has recently been formalized, forward-thinking educators have promoted its ideas for over a century. In *School and Society*, John Dewey advocated learning in the local environment:

> Experience has its geographical aspect, its artistic and its literary, its scientific and its historical sides. All studies arise from aspects of the one earth and the one life lived upon it (1915, p. 91, cited in Woodhouse & Knapp, 2000).

The approach uses a local lens to study broader contexts and applications, generalizing to and contrasting with other regions, human communities, cultures and ecosystems (Knapp, 2005; Semken & Freeman, 2008; Smith, 2002). Orr (2004) has elaborated these ideas in his call to reshape education by building "ecoliteracy" so that students can understand the effects of knowledge on real people and their communities. In this way, place-based education can provide a mechanism for students in unfamiliar settings not only to gain more regional familiarity but also to recognize unique aspects and parallels between their campus and familial homes.

Local Background & Need

[1] We used the definition of learning communities provided by Smith et al. (2009): "a variety of curricular approaches that intentionally link or cluster two or more courses, often around an interdisciplinary theme or problem, and enroll a common cohort of students" (p. 20).

The most remote of the 23 California State University (CSU) campuses, Humboldt State University (HSU) is located in a rural setting with a predominantly non-Hispanic white population (~75%) (U.S. Census Bureau, 2010). Most freshmen are full time and residential. Only 6% of students originate from the local area.[2] The majority of students come from large urban centers elsewhere in California (San Francisco Bay Area and Southern California). Since 2009, enrollment of underrepresented minority first-time freshmen in STEM majors has increased by over 80%. Since 2010, HSU has experienced a 23% increase in low-income students; in addition, 46% of incoming freshmen require pre-collegiate coursework. HSU became a federally recognized Hispanic Serving Institution in 2013, and in 2014, HSU enrolled its most diverse class, with nearly half of the incoming students from underrepresented groups. In 2015, over 55% of HSU's first time undergraduates were first-generation students, and this proportion rises to 70% among underrepresented students. These students are the new majority (Schneider, 2014), both at HSU and on many college campuses nationwide. They reflect the future workforce and graduate students in STEM disciplines.

As HSU's student demographic rapidly changes, HSU has challenged itself to develop programs that support inclusive student success, especially for first-time college students. The campus has identified courses in which a significant opportunity gap exists, many of which are foundational math and science classes taken by students in their first year. Student affairs has increased the services designed to support students outside of the classroom, but there is a disturbing gap in graduation rates between students from traditionally underrepresented groups (URG)[3] and non-URG students at HSU. The graduation rate for URG students is 14 percentage points lower than HSU's average six-year graduation rate for all first-time freshmen (42%), which lags about 8 percentage points behind the CSU system. In STEM disciplines, the gap is even wider, with 20% and 43% 6-year graduation rates for URG and non-URG students, respectively. Unlike many universities, which typically have lower graduation rates in STEM than in non-STEM disciplines, the graduation rate for all STEM students (43%) is about the same as the university-wide average (HSU Office of Institutional Effectiveness).

Objective

The rapidly changing demographic at HSU has made it difficult to cultivate an inclusive community of learners, one in which students from all backgrounds feel welcomed and valued. That a large proportion of our first-year students are residential, enrolled full-time, arrive from great distances, and are from nontraditional backgrounds suggested that a place-based learning community could be a useful approach to improve student outcomes at HSU. A pilot program called *Klamath Connection* was offered to a portion of incoming STEM freshman in fall 2015. Program leaders (see Program Administration, below) hypothesized that by building such a community, we could effect change in student and faculty culture, foster in students the skill and habits that favor academic success, and improve student performance in foundational courses. Our model hypothesizes a logical cause-effect chain that leads, ultimately, to realizing the long-term goal of the project—to raise retention and graduation rates and close gaps between the new majority and traditional students (Fig. 1). This hypothesized model is rooted in the broader theory supported by evidence from numerous campuses that have used first-year programs to create conditions that matter and build student engagement (Krause & Coates, 2008; Zepke & Leach,

[2] All campus analytics are from the HSU Office of Institutional Effectiveness.

[3] URG includes students who self-identify as African American, Latino/a, Native American, or Pacific Islander.

2010), and it has been contextualized for our campus's circumstances. In this paper, we describe the program's design, implementation, and initial practices; provide a general assessment of the first cohort; and conclude with some lessons learned and plans for institutionalization. Elsewhere, we present a more thorough analysis of the effect of the program on student perceptions and academic achievement (Johnson, Sprowles, and Margell, in review) and on students' cultural awareness and recognitions of parallels between lessons from HSU and their home communities (Sprowles, Malloy, and Johnson, in prep).

Figure 1. Hypothesized cause-effect chain leading to higher retention and graduation rates, and closed gaps between groups of students.

Program Overview

Our place-based learning community threads together curricular themes that support student success in gateway courses (Rocconi, 2011). Through a curriculum connected to the place-based themes, students are introduced to the ways in which different disciplines, including science, must be marshaled to solve challenging social, environmental, and cultural issues of our local region. Through local examples, students apply the larger lessons to their own home communities, thereby galvanizing the curriculum with a unique sense of place and relevance to their own lives. The *Klamath Connection* place-based learning community links scientific, environmental, social, and cultural themes of the Klamath River basin to four high impact practices: summer immersion, blocked scheduling of revised gateway courses, freshman year seminar (FYS), and peer mentoring. The community includes HSU students, faculty, student support staff, and off-campus community partners, including professional scientists, Native American tribal nations, and environmental restoration groups.

The program was designed specifically for first time college students enrolled in one of our four largest STEM majors: Biology, Environmental Science, Wildlife, or Zoology. We aimed to recruit 75 participants for the initial pilot program, which was launched for 2015/2016 academic year (hereafter AY 2015-16). In March, all first time freshmen students who had been accepted or provisionally accepted to one of these four majors (approximately 1000) were sent mailed invitations to participate.[4] Later in the spring, we followed with more focused outreach (e.g., emails from the program, calls from staff and faculty). Students were also encouraged to join the optional *Klamath Connection* themed housing in the residence halls. Next, we worked with students, the Math Department, and Admissions to determine the math preparedness of each student to enable block enrollment. As a result, the AY 2015-16 cohort was comprised of 63 freshmen distributed among the four majors as follows: 25 Biology (several emphases), 17 Wildlife, 13 Zoology, and 8 in Environmental Science.

Design and Implementation of Program Components

[4] HSU has a fairly low yield rate (i.e., many students who apply and are admitted choose not attend HSU), so the initial recruitment was large.

Initial Program Development And Administration

Launching this trial program required time and effort to build the concept, political will, and funding. We hatched some of our ideas in an interdisciplinary team sent by HSU administration to the National Summer Institute in Learning Communities at the Washington Institute at The Evergreen State College in 2011, but subsequent efforts to launch a learning community stalled. In 2014, a competitive funding opportunity was offered by the California State University system, with financial backing from the Helmsley Charitable Trust, to pilot experimental first-year reforms for incoming students in STEM. Humboldt's proposal focused on incoming students majoring in natural resource and biological sciences, reflecting the departmental affiliation of the principle investigators who outlined the core design of the project (Matt Johnson, Professor of Wildlife, and Amy Sprowles, Assistant Professor of Biological Sciences). Along with seven other California State University campuses (Kezar & Holcombe, 2017), HSU received funding, and preparations began in earnest in spring 2015.

A core leadership team was built of faculty and staff from several programs, including tenure-track and non-tenure track faculty in the departments of the core courses that *Klamath Connection* students would take in their first year: Mathematics, Biology, Chemistry, Communications, and Native American Studies. A lead coordinator staff position was advertised and filled in mid-spring 2015. Over the course of the next six months, the Lead Coordinator (Katlin Overeem) and project Principle Investigators worked directly with other key campus divisions, including the Registrar, Admissions, Marketing and Communications, Angela Rich of the Office of Retention and Student Success, and members of our peer mentoring program, Retention Through Academic Mentoring Program (RAMP) to plan, recruit for, and launch the first pilot program for AY 2015-16.

Summer Immersion

In the Summer Immersion, students participated in activities that would join them in the common purpose of learning about the HSU community and the Klamath Basin. The four day program was designed to deliver several messages to support the participating students in their transition to the campus community: (1) you are welcome to this exciting and diverse place and this academic community of learners; (2) you are a beginning scientist, and scientific content at HSU begins immediately; (3) the outdoors are part of your classroom; (4) as you work together to solve complex social and environmental problems, you will interconnect knowledge from across the disciplines; (5) your peers can help you learn, and vice versa; and (6) you have a range of offices and people—faculty, staff, students—who are here to support you and help you succeed. The students were grouped by major so that the thematic content they explored was linked to the academic year coursework. The shared experiences with *Klamath Connection* faculty, staff, peer mentors, and community partners created opportunities for students to quickly meet and work with individuals from the greater Humboldt community

This first summer immersion explored two different models: a camping-based experience, in which participants camped on the Klamath River for two nights with *Klamath Connection* faculty and staff, and a campus-based experience, in which the participants stayed in their dorm rooms and participated in off campus activities that included a day trip to the Klamath River. Both experiences included interaction with scientists, natural resource policy professionals, and cultural experts from Native American Tribes.

The camping group spent two nights and two days in Orleans, California at a U.S. Forest Service campground located in the mid-Klamath Watershed, the ancestral homeland of the Karuk Tribe of California. These students spent a day with employees of the Karuk Department of Natural Resources (Karuk DNR) learning about the importance of the Klamath River to the Karuk Tribal culture and the ways that Karuk DNR uses both Western science and traditional knowledge to advocate for natural resources policies like Klamath dam removal. They also participated in a hands-on experience with the tribe's water quality department to learn how these scientists contribute to water quality monitoring of the Klamath River. The camping students were accompanied by three HSU science faculty, one HSU staff member, and two peer mentors (see below for details), who helped link the experience to various aspects of HSU campus life.

The campus-based group spent one day participating in local field trips near campus, followed by a day at the mouth of the Klamath with Yurok tribal leaders and field scientists. Local field trips started with a primer on note-taking in the field and were led by faculty who teach the students' first-year courses. The topical emphases and student group composition were arranged by related majors (e.g., environmental science students explored a waste-water bioremediation project while wildlife students focused on birds and mammal at a local wildlife refuge). Then all the students assembled back on campus and were regrouped and tasked with sharing information from their own trip to others. This exercise was facilitated and guided by peer mentors and faculty. The purpose was to illustrate the importance and challenge of taking good notes in the field and to demonstrate that students can learn from each other.

The next day the students traveled to the Klamath River and learned how the Yurok tribal nation actively participates in scientific data collection, policy formation, and environmental management. A general welcome by the Tribe's Executive Director (the late Troy Fletcher) and the former Chief Cultural Officer (James Gensaw) emphasized the importance of co-management of natural resources among the appropriate management agencies of the Yurok Tribe and the United States, the profound cultural connection between natural resource and Yurok world view, and the centrality of traditional ecological knowledge to Yurok epistemology about ecosystems. Next, the students were grouped according to major to tour nearby locations with practicing scientists (in most cases employed by the tribe and/or an alum of HSU), with at least one faculty member, and with two peer mentors. The range of participants allowed students to explore how their chosen disciplines relate to this region: biological diversity at the mouth of the Klamath, ecological restoration along a tributary to the Klamath, and fisheries and wildlife management in and near the Klamath River Estuary.

Students in both the camping and campus groups collected Klamath water samples. Some of these samples were used in a laboratory experiment designed to introduce the scientific, environmental, and social impacts of the annual toxic algal blooms of *Microcystis aeruginosa* in the Klamath River reservoirs. This activity took place on the last day of the summer immersion, when the students participated in an experiment that allowed them to test the hypothesis that nitrogen is the limiting factor in algal growth in the Klamath River (described in Sprowles et al., in prep). The experience was also designed to be an introduction to the culture, facilities, and procedures of the student's fall semester Introduction to Botany laboratory class and was taught by two of their fall semester instructors (Frank Shaughnessy and Amy Sprowles). The data were collected during the first week of classes and linked to content in the first semester classes. The remaining water samples were frozen until the spring semester, when the students tested it for phosphorous levels in a newly designed chemistry laboratory course offered to all introductory chemistry students.

All students also participated in an academic assignment that introduced them to the tone of serious academic work, to the crucial role of peer support, and to campus library. For the assignment, students were provided an abridged copy of a Yurok Tribal Fisheries department report documenting an analysis of the factors responsible for a 2002 massive die-off of adult salmon in the Klamath (Belchik, Hillemeier, & Pierce, 2004). The assignment posed a hypothetical scenario about two classmates recently finding in the river a dying salmon that shows signs of a disease linked to the 2002 fish kill. The assignment challenges students to use results and graphs in their report to evaluate the hypothesis that this dying salmon suggests a fish-kill may re-occur. The students worked independently, then assembled in the library in small groups facilitated by peer mentors to share with—and learn from—their peers before revising and turning in their assignment. The assignment was evaluated and returned with comments by faculty in the first week of classes.

The final activity of the summer immersion was a social event for students, faculty and staff, a pizza party at a local beach. The next morning, the students participated in HSU's standard Humboldt Orientation Program (HOP) with the rest of the incoming freshman.

Blocked Scheduling & Gateway Courses

Klamath Connection (KC) students were grouped into cohorts by major and scheduled into specific sections of major and general education (GE) courses, each of which was a requirement for an HSU degree. We worked with department chairs to align the fall semesters of all participating majors as much as feasible (Table 1), which in some cases required deviating slightly from the current "first-year maps." The students were fully block enrolled in the fall term (14 to 17 units), but only partially block enrolled in the spring term. This was purposeful so that students did not need to learn the complexities of registration and course selection before arrival but would later have the opportunity to select some courses in consultation with their academic advisors and to learn the registration process in preparation for the spring semester. Block enrolling was accomplished through collaboration with the *Klamath Connection* Lead Coordinator, HSU's Office of Admissions, the Office of the Registrar, and the chairs and administrative staff of the participating departments. Some classes were "exclusive," meaning only *Klamath Connection* students were enrolled in the class (e.g., the critical thinking course). In other cases (KC) students were mixed with other non-KC students (e.g., the botany course), although we ensured the laboratory section of their science class was only comprised of *Klamath Connection* students. Since the second semester schedule included a course with a math prerequisite (chemistry), all *Klamath Connection* participants had to enroll in college algebra or higher the first semester. The Lead Coordinator worked closely with the chair of the Mathematics Department (Jeff Haag) to ensure appropriate math placement.

Table 1. *Klamath Connection* block-enrolled courses for academic year 2015-2016.

Fall	# sections, # seats each, % in learning community	Spring	# sections, # seats each, % in learning community
Intro Botany (for major and GE[A])	1, 144, 44%	Intro or Foundations of Chemistry [B] (for major and GE)	1 of each course, 120 each, 20-35%
Math[C]	3, 20-30, 50-100%	Intro Native Am. Studies or Natural Resource Conserv.[D] (GE)	1, of each course, 50-120 each, 10-100%
Oral Communication (GE)	3, 25, 50-100%	Intro Wildlife[E] (major)	1, 72, 20%
Critical thinking (GE	1, 63,100%		

Area A)			
Freshman Year Seminar (FYS)[F]	3, 20, 100%		

A General education
B Depending on major (Intro 107 for students majoring in Wildlife or Environmental Science, Foundations for all other majors in the program)
C Depending on preparedness (college algebra, accelerated college algebra, or calculus)
D Native American Studies was for all students in the program except those majoring in Environmental Science, as those students satisfy the corresponding area of HSU general education with their major courses
E Only for Wildlife majors
F Depending on major (1 unit course housing in the students' major department)

The curriculum for most of the courses included in the block schedule was modified only slightly, but in important and intentional ways. All instructors of block-enrolled courses were asked to aim at least some content of their course toward topics relevant to the Klamath River or Basin. In some cases, such as in the critical thinking course and Introduction to Native American studies, this redirect was fairly substantial. In others, such as the botany and chemistry courses, there was relatively little change to course content (e.g., a single lab was modified to more purposefully connect the learning objectives of the laboratory activity to water quality science of the Klamath River). However, there was also a deliberate effort to link content across courses; this was accomplished using the laboratory experiment conducted as part of the summer immersion. In the Fall semester, data from the experiment were analyzed in the students' math courses, the logic of the research design was discussed in the critical thinking course, and the biology of the algae was discussed in botany. At the end of the semester, instructors from all of these courses convened simultaneously in the critical course to discuss with students how these disciplines connected around this topic. In Spring semester, courses such as introductory chemistry, introduction to wildlife, and Native American studies, components of this topic were raised again and articulated with an absorption spectroscopy laboratory, wildlife conservation, and social justice, respectively.

Freshman Year Seminar (FYS)

Existing one-unit Freshman Year Seminar (FYS) courses from each of the participating majors were modified for this program to create a seminar specific to *Klamath Connection*. The FYSs were led by faculty from each of the departments who worked together to develop a syllabus that combined a mixture of "university 101" material (introduction to techniques and services to help students become more successful) and an introduction/welcome to the major. Individual instructors agreed to a common basic template but had considerable freedom to develop their own version for students in their major. Common exercises included an "exam wrapper" designed to help students identify gaps in their study strategies, note-taking for botany, and oral presentation practice for their oral communication course. Most instructors organized field trips and professional panels to incorporate major-based content. The FYS size was limited to 18 students per section.

Peer Mentoring

The *Klamath Connection* program partnered with the HSU Retention through Academic Mentoring Program (RAMP), a program on campus that utilizes one to one peer mentoring to guide freshman in their development of positive academic habits and study skills, introduce them to campus culture to help them find their "niche," inform them about university policies and procedures, direct them to campus and community resources and services, and provide support

through their transition to becoming college freshmen. Current HSU policy is to assign RAMP mentors to all incoming first-generation freshmen. We expanded this so that all KC students would have a RAMP mentor, regardless of first-generation status. The RAMP peer mentors were assigned a mentee caseload by matching enrollment of one by FYS section. When possible, the RAMP mentor had the same major as the students in their assigned FYS section. Because most RAMP mentors maintain caseloads of approximately 25 students, most had additional mentees not in the KC program. The approach to peer mentoring for KC students was generally similar to that for non-KC students, although communication between mentors, the mentees' faculty, and program staff was enhanced relative to non-KC students because of the integrative nature of the KC program. Throughout the week preceding summer immersion, RAMP mentors learned about the design and purpose of *Klamath Connection,* were introduced to the history and peoples of the Klamath Basin, and were trained on the summer immersion experiment and academic assignment. They also discussed cultural sensitivity, reviewed the unique challenges students in STEM face, familiarized themselves with the summer immersion itineraries in detail, and clarified the expectations of mentors. During summer immersion, RAMP mentors were primarily responsible for keeping track of and moving around groups of students, providing general support and encouragement, and leading by example as an enthusiastic student participant.

Extra-Curricular Activities

In an effort to engage students, foster community, and illustrate links between disciplines, we arranged a number extra-curricular activities throughout the year, including: (1) a dramatic reading of the play (and HSU's AY'15/16 Book of the Year) *Salmon is Everything*, (2) a trip aboard HSU's research vessel the *Coral Sea*, (3) a visit to the Ah-Pah Traditional Yurok Village, (4) a guest lecture on traditional ecological knowledge by a local tribal scientist, (5) an end-of-the fall semester game party/final exam study session, (6) a start of spring term cupcake party, (7) a native art-exhibit in the Goudi'ni Gallery, (8) a guest lecture by an ecologist and alum who studied the (dam-removed) Elwha River, (9) documentary film showings of *Return of the River* (Elwha River), *Battle for the Klamath* and *River Between Us* (Klamath), (10) an informational panel discussion about the latest on dam removal agreements, and (11) an end of the year tie-dying party. Many of these activities were in collaboration with both on and off campus partners, further illustrating the importance of community.

Through all of these integrated practices and activities, the program offered a substantively re-imagined first year experience for freshmen. To our knowledge, this is the first attempt HSU has made to create a comprehensive and interdisciplinary cohort-based learning community, and it is one of the only attempts to make that community place-based by focusing on the regionally unique landscape of which the university is a part. Our intention was to help students quickly achieve a sense of belonging at HSU and cultivate an identity as a student of their chosen discipline so that they would develop the academic skills and attitudes necessary for academic success. A survey was distributed to evaluate related social/psycho factors and standard academic success metrics of program participants (e.g. average course grades, first-year overall GPA, and retention into the second year). A review of these data are provided in a companion paper (Johnson et al., in review).

Lessons Learned & Institutionalization

Learning communities are well known to be effective practices to connect students to academic life (B. L. Smith et al., 2009; Tinto, 2003). For campuses that attract students of color to unfamiliar places and cultures, it may also be beneficial to help students better understand the campus region and to see connections between local issues and those of their home communities (Guiffrida, 2006). Combining elements of place-based education with practices of learning communities may prove valuable for particularly for rural campuses. Assessment of the first cohort suggests that our place-based learning community model is helping to achieve outcomes associated with both learning communities and place-based education (for details, see Johnson et al., in review). Social and academic integration appeared to be strengthened within the program, which Tinto's theory suggests can lead to positive outcomes for students (Smith et al., 2009; Tinto, 2003). As theorized, the linking of course content across classes helped students appreciate the interconnectedness of disciplines (Klein, 2005). However, there is concern that Tinto's theory inadequately considers factors for campuses that attract large numbers of students of color to predominately white regions (Guiffrida, 2006). The *Klamath Connection* focuses on social and environmental justice issues related to the Native American tribes along the Klamath, a focus that resonates with students from many backgrounds, including students of color from urban areas dissimilar to the campus region. Thus, place-based themes may prove useful for campuses needing to help students retain and nurture cultural connections to their familial homes, while they also develop appreciation for the campus region. We are currently administering surveys in the second and later cohorts of the *Klamath Connection* to better quantify the capacity for students to draw parallels from lessons along the Klamath back to issues near their familial homes (Sprowles et al., in prep).

Our assessment of the first cohort also revealed areas for improvement, particularly in cohort demographics and math placement. In the first cohort of the *Klamath Connection* program, Hispanic/Latinx students were underrepresented relative to the overall demographics in the same majors (22% vs. 42%, KC vs. the reference group, respectively). Our first strategy to address this discrepancy has been to modify our recruitment efforts to better target these students (e.g., develop bi-lingual recruitment materials and increase outreach to prospective self-identified Hispanic/Latinx students). These changes were implemented for recruitment of the second *Klamath Connection* cohort, and the demographic breakdown of the cohort better matched that of the participating majors (e.g., both were 34% Hispanic/Latinx). We will continue our expanded recruiting efforts, but perhaps the simplest and most effective way for the diversity of participants to match the demographics of incoming STEM students is for this program to become an "op-out" rather than an "opt-in" program. If the assessment of future programs shows similar improvements in student academic performance, we will work with the HSU administration to make this change.

For the first cohort, 20 students participated in a camping version of the Summer Immersion, while the remaining 43 experienced the campus-based version. Based on Summer Immersion surveys, additional surveys, and analysis of course grades and GPAs, we found very few significant differences in outcomes between the campus-based and camping groups. The camping option was more expensive per-capita, and it required additional planning. We also noted some envy among non-participants. Therefore, we modified our program for the second cohort so that all students participated in a campus-based summer immersion, but we retained the authentic exposure to fieldwork and the environments of the North Coast and Klamath Basin. We are currently investigating models by which students can participate in a camping trip during the academic year.

Our experience with the first cohort of the *Klamath Connection* also revealed shortcomings in the university's current methods to identify the math preparedness of incoming students so that they are enrolled in an appropriate first semester math course. To remain consistent with current HSU practices, we used California State Math Readiness Exam (ELM) and the existing Mathematics Diagnostic Testing Project (MDTP) exam (MDTP© Regents of the University of California) to guide math placement, but this system does not align with the timeline required for block scheduling. Extensive coordination and communication with the students by the Lead Coordinator and Math Department was required. This ultimately proved confusing to students and laborious for program staff and, in some cases, resulted in suboptimal math placement. We are working closely with the Math department to implement practices to improve placement and allow for students requiring math remediation to participate in our program. This includes the use of an online training and math placement system, ALEKS®, along with reformed remedial math curriculum to a "co-requisite" model (Logue & Watanabe-Rose, 2014; Complete College America, 2017). With this model, students with developmental math needs are co-enrolled in a college-ready math course (intro to college algebra) and a co-requisite math course that offers an additional section with content to provide more training and practice in developmental math skills. This model has two significant advantages: because students remain enrolled in a credit-bearing Freshmen math course and other first year courses with other students, they are not marginalized and, further, are able to stay on track with their peers in the program.

Institutionalization

The success of our pilot place-based learning community has catalyzed the Deans and Departmental chairs of HSU's College of Natural Resources & Sciences to plan the development of additional place-based learning communities to service all incoming STEM Freshmen by 2020. College leaders have examined the suite of majors offered by the college and arranged them into five clusters that will form the foundation of the learning communities, each of which contain similar first-year course requirements, related disciplinary emphases, and a unique place-based theme (Table 2). External funding obtained through the U.S. Department of Education[5] and Howard Hughes Medical Institutes[6] has been obtained to support the capacity building required for this transformation. Currently, the college plans to launch one new place-based learning community per year, using grant funds to compensate faculty for the extra time in the academic year and over the summer devoted to developing and implement each new program. Grant funds are also supporting two staff persons to coordinate these efforts. The University has committed to the institutionalization of the program components that demonstrate success in student performance, retention, and progress towards degree. Rigorous assessments will be necessary to aid in these analyses, and the grants have provided funds for a designated evaluation analyst.

Table 2. Current (2017) multi-year plan for rolling out place-based learning community for incoming first year STEM students at HSU.

Place-based Learning Community	Fall '17	Fall '18	Fall '19	Fall '20
Klamath Connection (natural resource majors)	125	180	240	240
Stars to Rocks (physical science majors)	55	55	55	55
Rising Tides (marine biology & oceanography majors)		50	50	50

[5] U.S. Department of Education HSI STEM and Articulation program award (#P031C160193, PI M. Johnson, co-PI A. Sprowles.

[6] Howard Hughes Medical Institute 2017 Inclusive Excellence Award #52008703, PI M. Johnson, co-PI/ Program Director A. Sprowles.

Biology theme[A] (biology, botany, and zoology majors)			110	110
Math & Computer Science theme[A] (math and computer science majors)				50
Total # students in place-based learning community	170	285	455	505
% of all incoming STEM students	34%	56%	90%	100%

[A] Name to be determined.

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