During Winter Quarter 2015, the fifteen departments and two programs that constitute the College of Liberal Arts continued discussions about our collective vision for the university’s future, identifying emerging trends, Cal Poly’s leadership opportunities, and the resources that will be necessary to realize them. We expect that in 2030 our focus will remain on the pursuit of excellence in the arts, humanities, communications, and social sciences, but we recognize that alongside such continuities we may also expect significant changes, including in how we approach teaching, understand learning, and engage in scholarship and creative activities.

Teaching, Learning, Scholarship: What effective approaches to teaching and learning are emerging in your field and related interdisciplinary areas?
Emerging trends in higher education emphasize the enduring importance of the disciplines, skills, and pedagogies of the liberal arts, while also highlighting ways to enhance and evolve our approaches to teaching and learning. These include the on-going centrality of the essential skills, the importance of collaborative and interdisciplinary learning, and new pedagogical approaches enabled by classroom technologies.

Employers, alumni, and faculty agree that the essential skills will continue to be critical to all Cal Poly students’ successes. Multiple surveys commissioned by the Association of American Colleges and Universities (AACU), for example, have consistently highlighted the need for students to be broadly trained in the liberal arts and sciences in order to develop the critical thinking, problem-solving, and communication skills that employers, graduate programs, and alumni themselves most value.¹ Similarly, the emerging consensus among researchers and commentators on higher education in the STEM, professional, and liberal arts fields is that students need to develop their abilities to communicate effectively, write clearly, think critically and creatively, make ethical decisions, solve complex problems, and be behaviorally, socially, and culturally competent.² The importance of these learning outcomes is also reflected in Cal Poly’s university learning objectives, the diversity learning objectives, CLA and individual program learning objectives, general education, and the various academic planning narratives produced by departments across campus this fall.

Increasingly, emphasis is given to the role that can be played by active learning pedagogies in achieving these learning outcomes. Current trends suggest that in the average classroom of 2030, less time will be devoted to disseminating information through lectures, and more time will be employed engaging students in discussion, analysis, debate, class projects, and student research. The importance of project-based, collaborative, and peer-to-peer learning is also frequently extolled in recent literature on teaching and learning. For many faculty in the CLA, this emphasis on active learning better describes an image of the present rather than a vision of the future; such approaches have long been central to many of our disciplines. For example, close analysis of a text, primary source, case study, or cultural artefact is a common and long-standing feature of upper-level courses in departments across our college. However, the balance of such activities with lecture, the degree to which they are employed, the utilization of classroom technology to
enhance them, and the integration of them at all levels of the curriculum represent areas of change over the last decade or two. Further, we recognize that pedagogies commonly referred to as active learning may not be appropriate for every class and that it is not possible to engage in sophisticated analysis, discussion, research, or meaningful projects without equally sophisticated content knowledge. While some faculty find readings and online course materials a useful way to convey such information, others have found in-person presentation of information, with it associated synchronous question and answer exchanges, best engages students’ critical thinking.

The difficult work of developing students’ essential skills can be at odds with other institutional priorities such as establishing the university’s financial security. Cultivating students’ writing and public speaking skills, for example, is challenging in larger classes. Research indicates that writing intensive classes, particular general education composition courses, should be capped at between 15 and 20 students. Smaller class size correlates with higher retention and graduation rates, greater student achievement, and higher rates of student engagement. Studies have shown such impacts are particularly noticeable for students who may struggle to develop academic literacy skills, including second language learners, students from underrepresented groups, and/or first generation students. The potential benefits of smaller class sizes, especially if predictions of a growing number of first generation and international students prove correct, must be balanced against the constraints created by the on-going public disinvestment in higher education.3

We anticipate that it will be increasingly important for students to develop the ability to understand, appreciate, and engage with the ways that different disciplines approach common problems. The Cal Poly graduate of the future is likely to be asked to work on diverse teams, which combine individuals with varied educational backgrounds trained to approach problems in distinct ways. We need to prepare our students to see such differences as assets rather than potential stumbling blocks. Further, integrating the natural sciences, social sciences, humanities, arts, and communications empowers us to more effectively tackle the complicated problems that face our globe. As a recent editorial in Nature argued, “If you want science to deliver for society…you need to support a capacity to understand that society that is as deep as your capacity to understand the science.”4 Effective solutions to the complex problems facing us require graduates who can bridge the gap between the liberal arts and the scientific, technical, and professional fields.

Nurturing such truly comprehensive polytechnic graduates requires encouraging interdisciplinarity through a variety of means. Among these are minors that provide a curricular structure for students who wish to explore interdisciplinary fields and topics. The CLA has long supported interdisciplinary minors; the ongoing nature of this commitment is reflected in the recent introduction of six new ones: Computing for Interactive Arts, Integrated Marketing Communication, and the four Science, Technology & Society (STS) minors.5 The required culminating experience for each of the STS minors, “ISLA 456: Advanced Project-Based Learning in Science, Technology & Society,” challenges students to harness the expertise developed in their respective STS minors as well as in their majors in order work in teams to investigate complex multidisciplinary issues. This may provide another model for future mechanisms by which some CLA students will have the option to work in interdisciplinary teams.
and/or under the supervision of faculty outside of their home departments for their senior projects.  

Collaborative teaching represents another way to introduce students to interdisciplinary perspectives. While a few examples of co-taught classes exist within the college, the relative rarity of them reflects the many challenges associated with team-teaching. Greater clarity on how such classes will “count” for faculty, how resources will be shared, and how such classes will be evaluated in the retention, promotion, and tenure (RPT) process may encourage more interdisciplinary teaching in the future. So, too, would a more streamlined and nimble curriculum approval process and shared collaborative spaces help to foster interdisciplinarity. We also maintain our belief that meaningful and successful interdisciplinary collaborations first require that students develop expertise within their chosen field of study. 

As discussed in the Fall 2014 CLA narrative, we anticipate that Cal Poly will continue to internationalize its campus through its composition, curriculum, and outlook. Broader trends in higher education suggest that we may see more international students on our campus and we hope to continue to send CLA students to study abroad in large numbers. The ease with which our students can do so during the academic year varies somewhat by major. Students in majors with more elective units and/or with fewer required classes that are only offered once or twice per year generally find it easier to study abroad. Working on research or projects with faculty represents an increasingly important means through which students develop an international perspective. For example, last summer students in Social Sciences assisted faculty research into the changing nutritional landscape in Fiji and others helped to install clean burning stoves in Peru. And, of course, many of our classes will continue to develop students’ global competencies by providing students with knowledge of global cultures and languages and the skills to understand and analyze global challenges from a variety of perspectives.

Successful Cal Poly graduates will need to understand the world’s peoples as well as their challenges. Alongside students’ global competencies, we believe it is crucial to develop their cultural competencies, including attention to diversity in the United States. The diverse teams on which we expect our future graduates will work are likely to include individuals who come from racial, ethnic, cultural, and socioeconomic backgrounds different from their own. Employer surveys highlight the importance of graduates who can solve problems with people with different viewpoints and who possess intercultural skills. We believe this will require a curriculum and co-curriculum that trains students to understand and engage with issues of power and privilege associated with race, class, gender, and sexuality. It also highlights the importance of recruiting and retaining both a diverse student body and a diverse faculty and staff.

Our fall discussions also revealed the importance of developing students’ information literacies, technological literacies, and research skills. While today’s students have access to an astounding range of information, they often lack the skills to locate relevant sources and to critically evaluate, assess, and analyze them. And despite the seeming ubiquity of students’ digital devices, research suggests that it is a mistake to consider them “digital natives.” This indicates the need to cultivate students’ abilities to understand, contextualize, and employ new technologies and the sorts of data they enable. As more faculty work with students to develop these competencies,
robust and reliable wireless networks as well as access to computer workstations during class
time will become increasingly critical.¹¹

More broadly, we can expect that technology-enabled learning will only increase in importance
over the next fifteen years. Faculty and students will continue to rely on “digital learning spaces”
such as PolyLearn, internet resources, library databases, and online collaboration tools for
classes, projects, and research. They will require the ability to produce as well as access digital
multimedia both in and out of the classroom. Videoconferencing technologies such as Skype and
Google Chatroom offer faculty the ability to bring outside speakers into their classes virtually.
This quarter, for example, such technologies enabled a Theatre class to discuss the play they had
been studying with the playwright herself and a Political Science class to present their final
project to their international partners in Fiji. As more classrooms are equipped to support such
activities, we anticipate that more faculty will avail themselves of them. Currently, however,
problems with network capacity and the limited number of spaces explicitly designed to support
videoconferencing technologies limits their use. Similarly, as we increasingly rely on course
management systems such as PolyLearn to provide students with access to course materials,
submit and complete assignments, and continue course discussions with their peers online, the
ability to reliably use these systems in and out of the classroom is absolutely critical. Widespread
availability of lecture capture technologies would enable more professors to post their lectures
online. Modern Languages and Literatures hopes that the next generation of such technologies
will allow them to offer synchronous hybrid language classes that include both Cal Poly students
and other students drawn from throughout the CSU.

Recent research acknowledges the important learning that takes place beyond the four walls of
the classroom, in office hours, informal and formal study sessions, co-curricular activities, and
serendipitous interactions between members of the campus community. As detailed below, the
desire for spaces that promote and enable such informal and co-curricular learning outpaces our
current inventory of them.

**Teaching, Learning, Scholarship: How should Learn by Doing incorporate new learning
needs, opportunities and technologies?**

The diverse modes of Learn by Doing in the CLA reflect the breadth of the concept itself. As the
2009 WASC report defined it, Learn by Doing is the “deliberate, intellectual process whereby
students, acting alone and in consort with others, gradually acquire essential knowledge and
skills through active, self-reflective engagement with the world inside the classroom and beyond
it.”¹² This definition usefully highlights the important role played by thinking and reflecting
within Learn by Doing.

Common forms of Learn by Doing within the CLA include senior projects, student research
papers, internships, community-based projects, and student-faculty research collaborations. But
they also include student performances, original artwork, student-run media, social justice work,
literary analysis, digital media production, debate competitions, packaging design, online
exhibits, and host of other endeavors. Increasingly, students’ work will be displayed and
accessed digitally. This suggests that the campus should revisit the idea of creating a consistent,
robust, and comprehensive e-portfolio format as a means for students to showcase their work. In
this way, they can demonstrate to graduate programs and potential employers what they did, as well as what they took, while at Cal Poly.\textsuperscript{13}

As the 2009 WASC report noted, what sets Cal Poly’s “signature pedagogy” apart is not any single example of it, but the wide range of opportunities offered and their integration throughout the curriculum. Our students are more likely to engage in experiential learning earlier in their collegiate careers than at many of our peer institutions.\textsuperscript{14} History majors, for example, learn to research and write like a professional historian during their first quarter by producing original scholarship on Cal Poly’s history using University Archives. The National Science Foundation and the AACU argue that integrating research experiences early into undergraduates’ collegiate careers increases retention and engagement, particularly for traditionally underserved students. Similarly, we believe that engaging students early and often in ‘doing’ the liberal arts – in the myriad forms that this takes – enhances student success.\textsuperscript{15}

John Dewey, whose work inspired the Learn by Doing motto, observed that we do not learn from experience, but from reflecting on experience.\textsuperscript{16} Recent research reinforces Dewey’s sentiment; these studies reveal that students show the greatest gains when Learn by Doing is combined with reflection.\textsuperscript{17} We therefore believe that self-reflection could be profitably integrated into all forms of Learn by Doing. And when Learn by Doing involves community partners or clients, an important part of the reflexive process should involve cultivating a “human-centered design process” that seeks to empathetically understand these individuals’ micro- and macro-contexts.\textsuperscript{18}

Although certainly not the only mode of doing so, community-based projects represent an important means through which students and faculty pursue their commitments to social justice and activist work. They also help to prepare students to become responsible local and global citizens, while developing leadership and project-management skills.\textsuperscript{19} However, many community-based projects can be difficult to complete within the confines of a ten-week quarter. More broadly, we imagine that the variety and efficacy of Learn by Doing experiences would be enhanced by greater flexibility in scheduling and space. Given our relatively small surrounding community, there are also finite opportunities for appropriate and meaningful community-based projects. Using the campus itself as a laboratory for learning offers one way to overcome such limitations. In Communication Studies courses, for example, students tested different types of appeals to determine which best motivated dorm residents to recycle, while others applied course materials to understand and propose solutions to the campus climate survey. Technology also enables us to no longer be constrained by a local definition of “community-based projects.” This quarter, for instance, courses in Liberal Arts and Engineering Studies (LAES) are collaborating with Australian academics and Brisbane community members to develop an interactive gaming experience.\textsuperscript{20} Increasingly, Learn by Doing projects and other class activities require a range of multimedia technologies, many of which are not readily available for use by all campus community members. Students and faculty would benefit from a centralized space that brought together such technologies along the lines of a media maker space.

Commentators on higher education increasingly trumpet the importance of experiential learning, including internships, co-ops, and study abroad.\textsuperscript{21} A recent survey found that 94% of employers would be more likely to hire a graduate who had completed an internship.\textsuperscript{22} Such findings highlight the importance of experiential learning for all disciplines, including the liberal arts.
Fifteen of our departments or programs already offer students the ability to earn course credit for internship or co-op experiences and we can only expect student demand for such opportunities to increase in coming years. Opportunities to enhance Learn by Doing include greater “earn by doing” funding to support student projects, research, internship, and student abroad opportunities, in order to ensure that such experiences are accessible to all Cal Poly students.

**Teaching, Learning, Scholarship: How does the teacher-scholar model fit?**
The teacher-scholar model aspires to integrate faculty’s active scholarly engagement with excellence in teaching. It describes faculty who are committed to both high-quality instruction and innovative research or creative endeavors. Ideally, teaching and scholarship are mutually reinforcing and energizing, as engagement in scholarship and creative activities enrich teaching, and teaching informs faculty’s scholarly production.

There is no one model for the application of the ideal to the reality of faculty life. How individual faculty members approach the two primary responsibilities described by “teacher-scholar” and balance them with often significant service obligations varies greatly. For some faculty, teaching and scholarship are deeply intertwined. These faculty may involve students in their research, as well as teach in areas directly tied to their scholarly endeavors. Their students receive course credit and/or financial compensation (often from grants) for their work as research assistants. In Psychology and Child Development, for example, students have the option to work on a faculty member’s research project to fulfill the major’s internship requirement. For other faculty in our college, the linkages between teaching and scholarship are less explicit and students’ direct involvement in their research or creative activity much less common. Faculty may desire to teach in areas more directly related to their specialty but the demands of general education or departmental needs limit their ability to do so.

The enduring challenge of carving out sufficient time for both teaching and scholarship is shared by all faculty members. Faculty surveys undertaken as part of the WASC reaccreditation process found that “lack of time due to workload is the greatest impediment to fully implementing the teacher-scholar model.” New internal grants at the college and university level, to pay for assigned time, supplies, and/or student assistants, represent important steps towards addressing these concerns. So too is the ongoing commitment of the college to support faculty travel to conferences and for research. The continuance and expansion of such efforts will enhance the ability of faculty to truly embody the teacher-scholar model and thereby contribute to student, and faculty, success.

Further, some faculty’s scholarly or creative activities are constrained by a lack of adequate project and research space, as detailed below. Another constraint facing faculty in our college are the understandably limited resources available through the library. The leadership and staff at the library have done a valiant job maximizing the resources available, particularly considering the rising cost of electronic databases. The interlibrary loan office, in particular, makes heroic efforts to borrow materials requested by faculty and student researchers. But increasingly many of the materials most desired are in subscription databases and therefore not available for loan. Our relative isolation from major research libraries makes such needs particularly acute, and further reinforces the importance of supporting faculty travel for research.
Many faculty in our college desire to engage in interdisciplinary collaborations as part of their scholarly or creative activities. Such a desire reflects a broader trend within academia towards more interdisciplinary and multidisciplinary work. As more faculty choose to engage in such collaborations, they will require clear guidelines on how collaborative or co-written scholarship will be treated for purposes of RPT. One of the barriers to greater interdisciplinary collaboration is faculty’s unfamiliarity with the research and creative interests of colleagues across campus and therefore ignorance of areas of overlapping interest or expertise. The persisting tendency for faculty to remain within their respective disciplinary silos and the few occasions when they interact with one another perpetuates this tendency.

Recent efforts to address faculty and staff pay represent important first steps toward ameliorating concerns related to faculty recruitment and retention. We recognize this is an ongoing and multiyear process and look forward to seeing additional progress in coming years. As the entire campus community is well aware, the high cost of living and, especially, housing in our area makes such efforts particularly important. High housing costs in San Luis Obispo will likely prompt more faculty and staff to live in the surrounding communities. Yet alternative transportation methods for those residing outside of SLO are inadequate to meet this likely demand. Currently, for example, regional bus systems do not schedule any arrivals at Cal Poly after 8:15 a.m. each day. Such a schedule makes regional public transit an impractical alternative for faculty who teach in the late afternoons or evenings. For other faculty, the difficulty of obtaining on-campus childcare ranks among their top concerns. Given ASI’s obligation to prioritize childcare for students, this problem could become more acute in the future if predictions of more non-traditional aged students prove correct.

**Learning Environments:** What learning environments should Cal Poly develop or modify to accommodate new modes of teaching and learning, Learn by Doing, and the teacher-scholar model?

We share the CTLT’s assessment that the quality of our current learning environments does not match the quality of the teaching which occurs within them. Over the coming years, we believe that the university will need to renovate existing spaces and develop new ones in order for Cal Poly to be fully positioned to realize its vision for 2022 and beyond. Within the CLA, about half of our departments or programs have significant space and equipment needs that will need to be addressed.

The CLA’s most pressing space-related need is to renovate and expand the H.P. Davidson Music Center into a suitable home for our outstanding performing arts programs, in order to bring all of Cal Poly’s performing arts under one roof and create synergistic opportunities for interdisciplinary projects. In addition, over the fifty years since Davidson was built, the size of the Music and Theatre & Dance programs has expanded dramatically, making the current practice, performance, teaching, rehearsal, and lecture spaces grossly inadequate to meet the performing arts’ existing and future needs. For instance, the current number and size of music ensembles requires additional and larger rehearsal spaces, and the existing facility lacks adequate space for instruction and recording in music technologies. Further, the two departments have significant storage space requirements that a remodeled building would address.
The college’s next priority is to develop an interdisciplinary project space to facilitate faculty research, student-faculty collaborations, and student projects. This would need to be a highly adaptable space that could be profitably utilized by faculty and students for a wide-variety of research and creative projects. It would address many of the concerns raised during the course of our academic planning discussions about the need for suitable space to support increasingly important project-based pedagogies. To do so, it should include meeting spaces, a computer lab, and project work areas when students and faculty could leave works-in-progress.

Our other top priority is for a College of Liberal Arts building. (The fact that this only ranks as our third priority further highlights the absolutely critical nature of our first two priorities.) As a recent guide for university planning declared, “physical spaces embody a community’s mental image of how and where learning happens.” The current absence of a CLA building therefore sends a misleading signal about the relative importance of the liberal arts within an institution that aspires to become the nation’s leading comprehensive polytechnic university. We therefore endorse Dean Phil Bailey’s vision of a CLA building standing side-by-side with the new Baker Science Center at the heart of campus, demonstrating, through the built environment, the integral role of the liberal arts and sciences as the foundation for all comprehensive polytechnic endeavors. A CLA building should reflect holistic and integrated learning by bringing the diverse disciplines of the liberal arts together under one roof and by integrating formal teaching and learning spaces with faculty offices and student support services.

Although we appreciate the many improvements made to instructional spaces in recent years, we also look forward to additional upgrades. We want to underscore that consistent, saturated, and reliable wireless networks in all classrooms is absolutely critical. In addition, as more faculty opt to employ collaborative learning pedagogies into classes at all levels and in both general education and major classes, rooms that can accommodate such activities will be in ever greater demand. Ideally, all instructional spaces would be flexible and adaptable to accommodate the wide-range of learning activities that our faculty employs. The Smart Classrooms in which the majority of our teaching occurs should contain furniture that is mobile, reconfigurable, and designed with group work and dexterity in mind. These rooms should be (re)designed with the idea that students will not just listen in class, but will also analyze, discuss, create, present, perform, and brainstorm. To do so, classrooms require technology that supports student and faculty multimedia presentations and contains ample space to move around. Current CSU density formulas make it difficult in some classrooms to configure all the desks into a circle or horseshoe. In other rooms, the density of desks prevents faculty from circulating between student groups. We also hope that in the future, Smart Classrooms will include document cameras and electronic whiteboards or similar technology that can capture the results of students’ discussions and brainstorming. We fully and enthusiastically endorse the CTLT’s suggestion that the BYOD (bring your own device) policy for faculty should be abandoned; instead, we would like to see all classrooms include installed computers that enable faculty to access their networked files and simplify the maintenance and support of these rooms for Classroom Technologies.

In addition to these general requirements for all Smart Classrooms, a few of our classes have more specific needs. Courses which make extensive use of multimedia and/or videoconferencing technologies would benefit from rooms along the lines of what CTLT has dubbed “Multimedia
Classrooms. In addition, rooms equipped with built-in video recording equipment would enable instructors in public speaking classes, as well as other classes, to record student presentations in order to provide a level of feedback that is not currently possible yet which research shows is particularly beneficial to student learning. Particularly in classes engaged in the study of the visual, such as in art history and film studies, classrooms need to be equipped with dimmable lighting, high resolution projectors, and true room-darkening capabilities. Upper-level and graduate seminars are often best taught around a conference table, so we hope that some of the remodeled Smart Classrooms will include mobile tables (rather than individual desks) that can be reconfigured in such a manner. We also perceive a need for additional spaces on campus that can accommodate co-curricular events such as film screenings, lectures, small conferences, student showcases, and public forums.

We trust that new and remodeled learning environments will be inviting, inclusive, empowering, and comfortable. We recognize that the quality of interior spaces is important to students’ learning. Natural light, carpeting, inviting paint color, air quality, and windows can all contribute to a student’s comfort and thereby help to create a sense of community in the classroom. In order for new and redesigned spaces to remain inviting, we will need to invest in people as well as space; in particular, we will need to invest in the custodial and facilities staff necessary to maintain our buildings. We hope that remodeled and new instructional spaces can find ways to mitigate the noise pollution that frequently disrupts classes and can make it difficult for quieter students to have their thoughts heard. Predictably, such environmental noise becomes a particular problem when warm weather requires classroom windows to be open. The seemingly now annual extreme heatwaves create learning environments so warm that we cannot reasonably expect any learning to occur and faculty have to resort to dramatically shortening or cancelling classes altogether. Although we recognize that introducing air cooling systems would be very expensive, we suggest that its consideration might be wise if current weather patterns persist.

Our college currently faces a shortage of instructional computer lab spaces. Increasingly, a subset of our courses, such as multimedia news reporting, visual communication, GIS, remote sensing, data journalism, and methodology courses in the social sciences, need to be taught in computer labs. Without dedicated CLA labs, we often have to rely on the library’s computer labs. These are increasingly difficult to reserve, which limits our ability to offer as many sections as student demand warrants. Dedicated CLA labs would also enable us to make more flexible use of such spaces and to ensure that the software best suited to accomplish our courses’ learning outcomes is installed. Staying current on such needs will require technical support staff responsible for any CLA labs. We hope that new or remodeled computer labs will be designed with student collaboration in mind; ideally we would be able to ‘put away’ the computer screens to enable other modes of learning that occur in computer-based courses such as mini-lectures, design, discussion, and small group collaboration.

Interdisciplinary teaching, student projects, and faculty research will require interdisciplinary spaces not “owned” by any particular college or department. In addition to spaces where such work could be undertaken, greater interdisciplinarity on campus might be facilitated through careful design of common spaces that draw faculty, students, and staff from throughout campus and lead to the sorts of accidental meetings and conversations that often precede interdisciplinary collaboration. As a recent report by the National Academies argued, “at the heart of
interdisciplinarity is communication – the conversations, connections, and combinations that bring new insights.” These conversations are most likely to occur in shared informal spaces such as coffee shops, faculty dining rooms, and campus pubs that draw faculty from every college.33

Recent trends in teaching and learning highlight the importance of informal learning spaces. Informal learning spaces represent “key areas for student academic work” as students typically spend more time in such spaces than in classrooms.34 As the university develops new spaces and remodels existing ones, we should consider making even the most utilitarian of spaces student-centered and learning-friendly. For example, hallways and corridors could become important places for class discussions to spill over beyond class time, if hallways were redesigned to contain inviting furniture and adequate space for small groups to congregate. An afternoon walk through the Baker Science Center quickly demonstrates how popular such spaces are with students and the variety of faculty-student interactions that they promote. Similarly, co-locating formal and informal learning spaces such as classrooms, faculty offices, individual study space, group study space and meeting rooms, helps to create permeable boundaries between spaces and modes of learning. This encourages informal interactions between faculty and students, while also creating a sense of intellectual community. One recent study found that informal learning spaces such as common spaces in academic buildings are more important to supporting learning outcomes than study spaces in residence halls or computer labs.35 These informal learning spaces will become even more important in the future if we see greater numbers of transfer students, who are less likely to live on campus and thus have access to study spaces within residences. A residential International House would provide a unique informal learning environment to promote the study of global cultures and languages. It could serve as both a residence for international visitors, visiting scholars, faculty and students, as well as a common home for the units on campus that work in tandem to bring world languages and cultures to our university.

Conclusion
By remodeling and developing new learning environments the Cal Poly community can further its efforts to pursue excellence through continuous improvement. The College of Liberal Arts looks forward to working with the broader university community to develop innovative curriculum, build an inclusive environment, promote Learn by Doing pedagogies, foster interdisciplinary collaboration, and nurture a happy and fulfilled faculty and staff, all with an eye on student success. Through our programs in the arts, humanities, communications, and social sciences, we will continue to focus on the human experience and expression, and help Cal Poly graduates to integrate the humane and aesthetic with the technical and scientific. In short, we will provide one of the foundations for a truly comprehensive polytechnic education.

2 See, for example, Loretta Jackson-Hayes, “We don’t need more STEM majors; We need more STEM majors with liberal arts training,” Washington Post (Washington, D.C.), Feb. 18, 2015, available at http://www.washingtonpost.com/posteverything/wp/2015/02/18/we-dont-need-more-stem-majors-we-need-more-stem-majors-with-liberal-arts-training/

4 “Time for the Social Sciences: Governments that want the natural sciences to deliver more for society need to show greater commitment towards the social sciences and humanities,” *Nature*, vol. 517 (Jan. 1, 2015): 5.

5 The four STS minors are Ethics, Public Policy, Science & Technology; Gender, Race, Culture, Science & Technology; Media Arts, Society & Technology; and Science & Risk Communication. Other interdisciplinary minors supported by the CLA include Agricultural Communication, Asian Studies, Gerontology, Indigenous Studies in Natural Resources and the Environment, Law and Society, Latin American Studies, Western Intellectual Tradition, and Women’s and Gender Studies.

6 This would address concerns raised in the Women’s & Gender Studies Fall planning narrative. See “Visioning Statement from the Department of Women’s & Gender Studies,” in “College of Liberal Arts: Envisioning the Future,” (Fall 2014): 40.

7 Collaborative teaching examples include linked sections of “ES 112: Race, Culture and Politics in the United States” that resulted in a common class project, cross-department teaching such as “RELS/POL 380: Religion and Politics of the Israeli/Palestinian Conflict,” and cross-college collaborations such as sections of “WGS/ES 350: Gender, Race, Science and Technology” co-taught by faculty members from CLA and CENG and stacked sections of “LAES 301” and “LAES 302” co-taught by faculty in CLA and CENG.

8 A related recommendation that resulted from our discussions was the introduction of a formal mechanism by which faculty who regularly teach interdisciplinary classes or in interdisciplinary programs could request an interdisciplinary peer review committee. The college has already established a similar mechanism for STS core faculty with the requirement that the STS Director serve on the peer review committee.


13 In 2009, the WASC working group recommended e-portfolios as a potential important resource to offer to students. “Our Polytechnic Identity,” 24-25.


21 See, for example, the special issue of Peer Review on “Internships and Experiential Learning,” in Fall 2010, especially Nancy O’Neill, “Internships as a High-Impact Practice: Some Reflections on Quality,” Peer Review, vol. 12, no. 4 (Fall 2010).
24 For regional bus schedules see http://www.slorta.org/schedules. Coming from North County, there are five inbound RTA buses that stop on campus each morning, between 6:13 a.m. and 8:11 a.m. The last outbound bus for North County leaves campus at 6:21 p.m., before many faculty finish teaching. The situation for faculty, staff, and students residing in South County is worse. There are only two inbound and two outbound buses per day that serve South County. The inbound buses arrive on campus 6:49 a.m. and 7:24 a.m. and the outbound buses depart campus at 4:05 p.m. and 5:15 p.m. This is clearly inadequate for faculty and students who rarely keep an 8-to-5 schedule.
31 Some faculty have reported problems with rooms, including computer labs, that do not have any blinds at all, while others report that even new rooms like Baker Science 101 are equipped with blinds that insufficiently block the light and therefore cannot be sufficiently darkened on a sunny day.
32 We recognize that the college’s need for computer labs in the future may be met in other ways, such as a mobile laptop station that can be brought into a given classroom, rather than a traditional lab consisting of built-in desktops. Kennedy Library’s Active Learning Lab is an excellent example of a computer lab that enables a range of modes of learning and which enables students to “put away” the computer screens when necessary.
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Introduction
Throughout Cal Poly, academic programs and departments have been asked to identify emerging approaches to teaching and learning in our fields and how these intersect with our current and future practices of Learn by Doing. In addition, we have been asked to explore how these intended practices of teaching and learning can be better supported by new and redesigned learning environments, as well as how all of these pedagogical arenas shape and are shaped by the teacher-scholar model.

Within the College of Liberal Arts, we are participants in a college-wide initiative designed to foster enhanced interactivity and productivity at the intersections of science, technology, and society – with an emphasis on the utilization and development of perspectives and tools from the arts, communications, humanities, and social sciences. We believe that learning, teaching, making, and doing in this area will only become more necessary to the success of all Cal Poly students in all majors and to the well-being of our local, regional, and global communities during the next 15 years. When we look to the future and envision both its challenges and opportunities, we see the Science, Technology & Society Initiative as not only a “good fit” for Cal Poly, but an integral component of Cal Poly’s success as a 21st century comprehensive polytechnic university.

Before sharing our own particular perspective, we wish to affirm the College of Liberal Arts narrative provided in response to the academic enrollment planning questions in Tier 3. We have selected to submit a supplemental narrative because we believe that the success of the interdisciplinary Science, Technology & Society Minors Program requires specific changes to the physical environments of teaching, learning, making, and doing, as described below. Lastly, we believe that multi- and interdisciplinary programs require specific attention in the university’s effort to imagine our spatial future. We make our contribution to foster this attention here.

Teaching, Learning & Scholarship in the Science, Technology & Society Initiative in the College of Liberal Arts
To date, the Science, Technology & Society (STS) initiative in the College of Liberal Arts is focused on the development of four related yet distinct minors (recently approved by the Academic Senate for inclusion in the 2015-17 catalogue). Finalized 2015-17 catalogue descriptions are provided below:

1. The Ethics, Public Policy, Science & Technology (EPPST) minor enables students to understand the complexities of contemporary science and technology policies as they relate to the broader public, ethical theories and applications, and personal and societal values; appreciate the historical influences on existing policies and practices; evaluate current policies; and assess the potential outcomes of proposed policy changes. A broad
range of elective courses provides students with the opportunity to customize the EPPST minor to their particular interests, allowing them to pursue further knowledge in a focused subject area—such as biotechnology, sustainability and the environment, genetic engineering, health, development, agriculture, and the technologies of war. Students completing the EPPST minor will gain important skills for creating, proposing, promoting, and evaluating policies that respond to the profound challenges and choices we face related to science and technology in the 21st century at local, national, and international levels.

2. The **Gender, Race, Culture, Science & Technology (GRCST) minor** provides students with the opportunity to explore and analyze the historical and contemporary relationships between gender, race, culture, science, technology, and medicine in local, national, and transnational contexts. Utilizing feminist and critical race approaches from the fields of gender and ethnic studies, the GRCST minor examines the role of cultural, ethical, social, political, and economic factors in determining the norms, values and meanings of scientific, technological, and medical practices, with an emphasis on the ways in which the production and applications of science, technology, and medicine shape and are shaped by knowledge and beliefs about gender, race, class, and sexuality. Students completing the GRCST minor will gain important intellectual and practical skills for creating, enacting, and evaluating efforts to create more socially just, equitable, and inclusive science, technology, and medicine in an increasingly diverse and globalized world.

3. The **Media Arts, Society & Technology (MAST) minor** encourages students to explore the ways in which the media arts are enabled and shaped by progress in science and technology while also being uniquely situated to promote engagement with and critical reflection about the meanings of scientific, technical, and social progress. Throughout the MAST minor, students are provided with the opportunity to develop and refine their expertise in the creative, visual, communicative, and performing arts, such as film, video, still photography, sound design, stage and lighting design, computer graphics, and interactive entertainment. Through hands-on projects and explorations of media history and theory, students completing the MAST minor will develop and apply knowledge and skills in conceptual and critical thinking, media literacy, teamwork, leadership, interdisciplinary collaboration, and project management, and will be prepared to function as both cultural commentators and creators positioned to address and respond to the profound challenges and choices we face in the 21st century.

4. The **Science and Risk Communication (SRC) minor** enables students to investigate how individuals and societies create, disseminate, maintain, and challenge perceptions of science, technology, and risk in multiple contexts. Such contexts might include doctor-patient interactions, public understanding of and engagement with global climate change or technology development, and scientific testimony in public policy hearings. Through hands-on projects, SRC students will develop and practice specific skills for communicating about science, technology, and risk to various audiences across multiple
media formats. A broad range of elective courses allows students to customize the SRC minor to their particular interests, enabling them to pursue knowledge in a focused subject area or further refine communication production skills. Students completing the SRC minor will be prepared to understand, engage with, respond to, and communicate about the profound challenges and choices we face related to science, technology, and risk in the 21st century.

As should be clear in the minor descriptions, our vision of teaching and learning in Science, Technology & Society (STS) integrates and showcases Cal Poly’s distinctive Learn by Doing pedagogy. This vision of STS—for ourselves and for our students—is in line with a new field-wide emphasis on “making and doing” in STS at large, and integrates traditional forms of scholarship with “practices of participation, engagement, and intervention in [our] fields of study.”

The new “making and doing” movement in STS centers attention to what Woodhouse, Hess, Breyman, and Martin (2002) identified as a reconstructivist or interventionist program in STS. As Hamlett (2003) observed, “it seems only a small step from asserting that technologies are socially constructed (or that technology and society are mutually and reciprocally constructed) to asking more normative questions: How should technologies be constructed? Which ‘relevant social groups’ ought to be included in the process? Are there morally preferable ways for the creation of technological frames? How should interpretive flexibility come to closure? When and how should closure be reopened?” (Hamlett, 2003, p. 115; cited in Woodhouse, et al, 2002, p. 298). As part of this field-wide movement, the Society for the Social Studies of Science (4S) created a new meeting format and awards called “STS Making and Doing” at its annual conference in August 2014, featured within the Call for Papers associated with the 2015 conference.

Like the Society for the Social Studies of Science (4S), our goal in the Cal Poly STS Initiative is to “improve the effectiveness and influence of STS scholarship beyond the field [and] to expand the modes of STS knowledge production.” We explicitly recognize that making and doing in STS can and should vary widely in format, methodology, audience, and intention. Woodhouse, et al, (2002, p. 311) created Table 1 (below) as a heuristic to demonstrate this understanding. The 2015 Call for Papers (below) for the annual meeting for the Society for the Social Studies of Science (4S), for example, identifies multiple arenas of making and doing in STS. STS at Cal Poly— if provided with necessary resources including the spatial needs described below—is positioned to function as a leader in the “making and doing” movement within our field.
Society for the Social Studies of Science (4S) 2015 Call for Papers: Making and Doing
http://www.4sonline.org/meeting/sts_making_and_doing_call_for_submissions

- **Policy:** STS projects that resulted in policy papers, recommendations, regulations, devices, decision-making practices, or other policy outcomes. Policy arenas include medicine and health, development, infrastructures, and communication in addition to those explicitly oriented to science and technology.

- **Design and Planning:** STS projects that resulted in the design and creation of effective products, graphics, spaces, and landscapes. The outcomes can be large or small in scale, and can be digital in content. Projects can be organized around different design themes, e.g. participatory design, sustainable design, etc. The presentation should show explanation of design process and how various actors are involved in the process.

- **Arts:** STS projects that resulted in effective artistic creations, including those in audio-visual format or in public installations, exhibits, and performances. The presentation should be accompanied by a narrative that links the project to STS scholarship.

- **Pedagogy:** STS projects that resulted in effective practices for education and training. The project can aim at different levels and forms of education and training, for instance university courses, high school classes, or special training courses. The presentation should indicate how the project increases awareness and understanding of STS scholarship.

- **STS infrastructures:** STS projects that resulted in effective informational or material infrastructures for the construction, operation, and travel of STS as field or discipline. Such might include the building of degree programs, modes of print and electronic publication, professional organizations, summer schools, institutes, scholarly collectives, and the 4S annual meeting itself. The presentation should move beyond promotion to include reflective analysis.

- **Open Category:** Any project that reflects the objectives of STS Making and Doing, including civic engagement, social activism, public debate and festivals, etc.

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**Learning, Teaching, Making & Doing Environments in the Science, Technology & Society Initiative**
The STS Initiative in the College of Liberal Arts at Cal Poly draws from the expertise, experiences, and imaginations of faculty in departments from across the college. (In the near future, following the recent approval by the Academic Senate of the STS Minors Program, we also expect to more systematically engaged colleagues from across the university in this area.) We believe that this multi- and interdisciplinarity is one of the greatest strengths of this effort, but also one of our most significant challenges.

As background, there are four STS Core Faculty hired specifically to contribute to the STS Minors Program, and their teaching and service assignments are divided between their tenure-home department and STS at roughly 50%. In addition, fourteen affiliated faculty currently serve on the STS Advisory Committee in the College of Liberal Arts on a voluntary basis, in most cases teaching courses in their home department that contribute to the STS minors as core courses and/or electives.

This structure means that there is little danger that the STS Minors Program and its faculty will create a new silo within the college, as each of us are tightly connected and contributing to at least one other area within the college. This is, indeed, a strength. At the same time, however, it also means that we do not have a “home” for STS at Cal Poly. As a result, in many cases, faculty only interact with each other during 50-minute STS Advisory Committee meetings that occur 2-4 times per quarter. These meetings are agenda-ized, and there is little time for the deep and ongoing conversations necessary to build professional and personal relationships with each other. While, of course, some STS faculty interact with each other on a more regular basis, we believe that teaching, learning, making, and doing in STS Initiative would be strengthened if there were more opportunities for “corridor talk” amongst all participants.

What is “corridor talk”? In 1997, STS scholars Gary Downey, Joseph Dumit, and Sharon Traweek included, as an appendix to their *Cyborgs and Citadels* edited collection, a chapter on “corridor talk,” and its importance for STS, in particular, and multi- and interdisciplinarity, in general. In this publication, “corridor talk” was defined as:

1: the practice of passing on tips, insights, and strategies about the means of production of academic work (as at professional conferences, where, it is frequently remarked, the most important business takes place “out in the corridor” rather than inside the meeting rooms)
2: nonascribable (off-the-record) but necessary information; practical gossip
3: common sense, informal (but not publicly taught) mentoring; the unsaid, but frequently said anyway (though not to everyone) (p. 245)

For the STS Initiative at Cal Poly, “corridor talk” is even more important, as we understand “corridor talk” as a site for both the sharing and production of knowledge. As such, “corridor talk” is an integral component for the ongoing formation of an “STS at Cal Poly” identity. As faculty, for example, “corridor talk” is necessary “work” that does/would/should/will guide the development of existing and new courses, as well as our efforts to identify external funding to support our individual and collaborative making and doing in STS.
Without a sense of shared “STS at Cal Poly” identity amongst the faculty and of an “STS home,” we run the risk of creating an interdisciplinary program in which students are asked to carry the burden of becoming interdisciplinary themselves, without modeling and support from faculty about the many different ways of making, doing and being collaborative interdisciplinary partners and knowledge producers. We believe that this would potentially undermine student learning outcomes in each of the four STS minors. A study by Newswander and Borrego (2009) found that, for example, although they desire to do interdisciplinary work, the students and faculty in traditional departments [seeking to do interdisciplinary work] are required to meet additional and often conflicting requirements. Engagement may further be complicated because these participants feel divided between collaborations, social networks, and expectations that pull them in different directions. Other tensions may stem from difficulties in determining allocation of resources (departments are hesitant to invest in initiatives that will distribute benefits across academic units) and evaluations (criteria for interdisciplinary work are still unclear; Committee on Facilitating Interdisciplinary Research 2005; Klein 2008). Additionally, engagement in an interdisciplinary program may be seen by some as a career risk (Rhoten 2004) (p. 561).

We recognize that this situation is complex, and that potential responses are not limited to questions of physical space. The primary question is perhaps this: “How do we maintain faculty and student connections to existing disciplines at the same time as supporting the development of an interdisciplinary identity and program?” While an “STS home” would not address all of the concerns raised by Newswander and Borrego and others (e.g., Holley, 2009), we believe that a physical “STS home” is an integral component of efforts to make our interdisciplinary program work, and would provide students many benefits, including 1) support for the development of students connections within and between STS minors; 2) the formation of a making and doing focused student “STS identity” within and between STS minors; and 3) a space to develop and display project-based work in STS.

We also wish to note that we recognize the very real space limitations on university campuses, and the prioritization of learning spaces with a formal purpose (e.g., labs, classrooms). In this context of constraint, a “home” space for interdisciplinary communities becomes a **reward** for successful institutional formation rather than a **resource** to support the process of formation. Spatial negotiations are, indeed, complex. However, as teacher-scholars in a field that has demonstrated that spatial organization matters at the individual, institutional, and structural levels (Bowker & Starr, 1999; Grosz, 2001; Winner, 1988), we suggest that space must be allocated and (re)created as part of the formation of interdisciplinary teaching, learning, making, and doing communities if these communities are to thrive at Cal Poly.

Shared community space, in a sense, would contribute to a shift of responsibility for building and maintaining interdisciplinarity from the shoulders of individual faculty, staff, and students (and our specific relationships with each other) to the institution, thus positioning our interdisciplinary programs to survive future shifts in faculty, student, staff, and community
partner participation. Shared space can thus be understood, in line with STS-thinking-at-large (Latour, 1987), as an actor in our interdisciplinary network, rather than as simply a site for our networking. Too, by having a “home,” STS students, faculty, and staff can spend less time “scheduling” our interactions, and more time focused on building authentic connections with each other, our local and international partners, and between our program and the broader field.

What should this interdisciplinary space for teaching, learning, doing, and making in STS look like? What are the needs it must/could/should serve? How can faculty and students “live” in both traditional disciplines and STS at the same time and what role can space play in supporting this effort? Overall, as STS faculty, we share the concerns raised by the CTLT and believe, as stated in the CLA narrative, that, “the quality of our current learning environments does not match the quality of the teaching which occurs within them.”

Many of the spaces on campus simply do not work for the pedagogies we seek to implement and employ. In meetings and surveys responses, STS faculty spoke repeatedly about the need for flexibility, transformability, and malleability of teaching and learning spaces, asking for spaces that allow for:

1. re-organization in response to specific course or project needs on a day-by-day basis?
2. effective utilization of technology in coursework, while avoiding the domination of the technology (e.g., screens) in other aspects of the class meeting?
3. formal and informal meetings between students, faculty, staff, and community partners that, in some cases utilize information communication technologies?
4. collaborative work spaces, labs, and studios in which “in-progress” projects do not need to be put away and that can be utilized by students outside of class time?
5. long-term installations of previous work?
6. rich data collection as part of interviews, focus groups, or experiments?
7. campus and public events ranging from film screenings to public forums?

At the same time, we recognize that, in some cases, dedicated or specialized facilities are necessary. For example, many students in the existing filmmaking and visual studies classes that will function as core courses in the Media Arts, Society & Technology minor lack access to hardware and software equipment that we judge to be the minimum levels of technological support for the teaching, learning, making, and doing we expect to occur in these courses. CSU Monterey Bay’s Cinematic Arts Editing Labs (https://csumb.edu/film/facilities-equipment) offer one model for what meeting a minimum standard of technological support for these courses might look like. STS projects that utilize quantitative and qualitative software likewise have specific technological and spatial needs. In addition, given our existing and planned utilization of off-campus Learn by Doing opportunities, we believe it is important that the university consider student transportation to-and-from campus to Learn by Doing field and production sites, as we should not assume that our students have access to car or truck transportation.
The Kennedy Library’s Active Learning Lab offers one model for the type of flexibility envisioned by STS faculty. The redesign of 2nd floor of the Kennedy Library to facilitate collaboration is also a productive model. Many universities and particularly K-12 schools have already engaged in this process of re-imagining educational spaces (for example, see Figures 1 & 2) and we encourage the university to utilize this existing knowledge base.

We are also inspired by the design of the Warren J. Baker Center for Science & Mathematics because of its integration of flexible and specialized space. As described on the CSM website, “Learn by Doing has been designed into the building. Ample study spaces encourage teamwork and close student-faculty interaction, advanced instrumentation rarely available to undergraduates fills the labs, and studio classrooms integrate lecture and lab, allowing students to actively discover science.” The building is also described as a “crossroads” that is “[l]ocated at the heart of campus to powerfully symbolize the central nature of science and mathematics in the university’s polytechnic curriculum.” We imagine a campus in which in our work is as powerfully represented, visible, open, and inviting to the campus community.
**Spatial Conclusions: Thinking Beyond “Home”**

We have employed the “home” metaphor, above, to capture many of our hopes for future interdisciplinary spaces at Cal Poly. However, this is not the only productive metaphor that may be employed, and we encourage the university to adopt and utilize multiple metaphors as we develop a response to the spatial needs of interdisciplinary programs such as ours. We are especially eager to provide this encouragement given the STS scholarship on the constraining and limiting impact of “single metaphor” thinking on data collection, knowledge production, and creativity (Martin, 1991; Schiebinger, 1993; Subramaniam, 2001; Upchurch & Fojtova, 2009). Other metaphors that have emerged in our discussions with each other include “hub,” “spoke,” “crossroads,” and “borderlands.” Regarding the latter, attention to the challenges, power, and possibilities in these geographic spaces of multiplicity has been most extensively developed by Chicana feminist Gloria Anzaldúa. Support for and interrogation of interdisciplinarity was only a part of Anzaldúa’s work. However, we believe that Anzaldúa offers us important direction as we continue to imagine the future of interdisciplinarity – and the space it requires and engenders – at Cal Poly. In “The New Mestiza Nation: A Multicultural Movement,” Anzaldúa (1992) wrote that, “multicultural mestizas” – those who are situated within (and simultaneously without) multiple, plural, contesting identities and communities – “want to connect to all our different communities ... The mestiza is in a position to make links.” In this essay, Anzaldúa then explores different metaphors for understanding what it means to function at, within, and across the borders of existing (presumed stable) communities. As described by Anzaldúa, a “borderlands person,”

… has the choice to be a bridge, a drawbridge, a sandbar, or an island in terms of how she relates to and defines herself in the world. She chooses when to do coalition and alliance work. ... As a drawbridge, she withdraws part of the time and says, “I don’t want to have anything to do with straights, whites, males, etc. I need some time to be myself, my people. I need time to recharge, regenerate my batteries.” The person who opts to be an island says, “I don’t want to have anything to do ever with the straight or white folks.” ... A symbol for another kind of bridge is a sandbar. One type of sandbar goes from island to mainland. That is my choice of a bridge because it’s natural and it’s underwater, which means I can be alone when I desperately need to, or I can connect to people. My creativity starts with solitude … but it also needs close contact with others in my different communities where we discuss mutual cultural and literary issues and support each other with our theories, experiences, and writing (p. 282).

We recognize that there are many differences in positioning between ourselves and Anzaldúa, and are concerned about the dangers associated with appropriating and decontextualizing her theory and research for the purpose of this document. At the same time, however, in rereading Anzaldúa alongside our discussions about spatial arrangements, we have been struck by the real need for Cal Poly to think metaphorically about the (re)development our spatial and organizational landscapes as part of strategic and master planning. As a university, we have rejected “silo-thinking.” What comes next? As Anzaldúa documents, being a “borderlands person” can mean being “caught in the crossroads between camps ... not knowing which side to
turn to, run from” (1996). Anzaldúa suggests however, that “[t]o survive the Borderlands / you must live sin fronteras / be a crossroads.”

The challenge then, as we see it, with inspiration from Anzaldúa, is for Cal Poly to better support faculty, staff, and students who function as and make different kinds of connections to each other, our disciplines, and the worlds beyond our campus. **What are the kinds of bridges/connections we want to be and to support?** Addressing spatial issues is one component of this important effort, as is the development of new metaphoric thinking. We welcome the opportunity for continued participation in this effort.

**References**


