Re-envisioning a Polytechnic Commitment

The prominence of information technology as a transformational force in higher education is affecting campuses everywhere, but it has special resonance at California Polytechnic State University. Cal Poly, as the institution is widely known, is one of a small number of U.S. colleges and universities that embrace a polytechnic mission. Since its inception in 1901, Cal Poly has also infused a distinctive “Learn by Doing” approach throughout its curriculum. Although it is a mid-sized (18,000 students) comprehensive state university that includes the familiar array of majors in the humanities, sciences, education, and business, the polytechnic components remain at the core of the school’s identity. Thus, as the expansion and diffusion of information technologies is prompting rapid and profound changes in American society and in cultures around the world, we at Cal Poly are taking this opportunity to re-envision what polytechnic means for the campus—and we are leveraging this re-envisioned perspective to inform our approach to innovative technologies in educational practices.

Given the rapid and alluring developments in technology, it’s critical to resist “the next big thing” as a quick-fix solution to drive change. We are striving to ensure that our core educational outcomes remain the touchstone for decisions about how we can better educate our students and which technologies we will use toward that goal. Our aim is to craft a thoughtful, informed approach that will enhance the rigor of students’ learning while preserving the university’s unique polytechnic character and distinctive “Learn by Doing” principles.

To that end, we are working to build into our approach the idea of continuous improvement so that we assess as we go, recalibrate, and continue to push forward in an effort to thoughtfully incorporate effective and relevant technologies into instruction. This notion of continuous improvement is a key component of reinvigorating Cal Poly’s educational effectiveness to meet our students’ needs today, so that they can be successful leaders in tomorrow’s society.

The new reality of today’s technological society demands that all graduates be prepared with technological competencies, regardless of their major and their career plans. Our response to that imperative is to embed a form of “technology across the curriculum” into the university’s academic vision. This is best captured in the language of the strategic plan: “Cal Poly will define all majors as ‘polytechnic’ having depth of expertise in the professional or academic discipline, and breadth, balance and literacy in technology, the arts and sciences, integrated seamlessly to prepare whole-system-thinker graduates.”

When our students graduate—whether their major is engineering or English, architecture or art, computer science or chemistry—they should possess not only the competitive technology skills that are essential for their personal and professional lives but also the ability to critically evaluate today’s technologies and to assess those that will emerge in the future. Our students should be able to provide leadership in selecting and using technology ethically and sustainably from personal, societal, and global perspectives. This re-envisioning of polytechnic literacy as a core competency for an educated citizen adds a new dimension to Cal Poly’s efforts to incorporate technology into instruction. It means that instructional technologies should provide opportunities to enhance student learning, along with the mechanism and a model for infusing polytechnic competencies throughout the curriculum.

Of course, as is true on many other campuses, there is great excitement at Cal Poly about how innovative instructional technologies and online resources can improve student learning. That enthusiasm was apparent last spring at a President’s Cabinet meeting, which was open to the campus community. With the theme “Leveraging Technology to Enhance Student Learning,” we highlighted the work of Cal Poly faculty members who are already incorporating technology into their teaching. In addition, leaders from other campuses across the country described their impressive technology-related accomplishments. Finally, representatives from a spectrum of industries talked about their current pushes to leverage technology in their companies and detailed the competencies they expect of their employees.

Momentum is clearly building at Cal Poly for innovative methods of applying technology in instruction. The Academic Senate passed an e-learning policy to recognize faculty members’ growing interest in—and the importance of quality for—the design and teaching of online and blended courses. The campus teaching center was recently incorporated into the
newly created Academic Technology unit, thus consolidating resources for exemplary teaching practices and support for instructional technologies. This partnership will help to ensure that the university's academic rigor will remain high even as the specific instructional methods and technologies evolve for blended and online instruction.

It is specifically through this support of faculty that Cal Poly can accelerate its progress toward a campus-wide polytechnic commitment. To this end, more opportunities are planned to help faculty strengthen their use of instructional technologies and hone their abilities to infuse a broad set of technological competencies into student learning experiences. To effectively leverage technology, faculty need to be able to make informed decisions about the specific instructional and profession­ally relevant technologies they will employ for achieving the desired student learning outcomes and objectives. Faculty can make effective decisions only if they are able to critically analyze the benefits and tradeoffs of the various technological options and then couple those options with appropriate instructional methods.

Accordingly, faculty across all disciplines must have “breadth, balance and literacy in technology” to be able to apply principles of critical analysis to technologies for instructional use, much as Cal Poly strives to foster “breadth, balance and literacy in technology” among all its students. As more faculty engage this challenge, the result will be instruction that reflects the exemplary design and effective use of technology for clear learning goals. In addition, faculty will be able to model for their students how to incorporate polytechnic competencies into learning activities, thus embedding the skills in learning outcomes. This is an example of Cal Poly’s enduring “Learn by Doing” principle. Faculty members’ polytechnic literacy will show students, firsthand, how to apply these skills as an essential part of their learning process—over multiple classes and throughout their degree program.

As a residential campus, we have an appreciation for nurturing a meaningful “sense of place” in which learning occurs not just in the classroom but in the field, in the community, and online. We see selective and informed use of technology as critical to enriching the learning environment and students’ connections with each other and their professors wherever learning occurs. If we intend for all students to develop polytechnic competencies, their degree should include broad experiences in many courses—and in co-curricular activities—where faculty are modeling real-world technological competencies and weaving those principles into course goals and learning outcomes. Online instruction, with all of its advantages for student access and instructional efficiencies, is thus a complementary component of Cal Poly’s more comprehensive polytechnic approach.

Amid this wave of opportunity triggered by seismic changes in technology, we are working to keep the best of what Cal Poly has always been while simultaneously working to create the best of what the university can become. This is an ambitious agenda—one that will take time and ongoing work to achieve its full promise. But we are confident that we are moving in the right direction. Our polytechnic identity, coupled with the “Learn by Doing” philosophy of instruction, has earned Cal Poly a strong reputation for producing resourceful professionals and innovative leaders. As employers have noted: “Cal Poly graduates have two hands on the problem and both feet on the ground.” By re-envisioning our current polytechnic commitment, we can continue this tradition of success for future graduates.

Patrick B. O’Sullivan (posulliv@calpoly.edu) is Director of the Center for Teaching, Learning and Technology at California Polytechnic State University. Jeffrey D. Armstrong (presidentoffice@calpoly.edu) is President of California Polytechnic State University.