Interactions Across the University

Recommendations for strengthening ties across campus

This paper was published in June 2015. The ideas and recommendations within it are among dozens of suggestions that arose from the Stanford Engineering Future process. Share your thoughts with us at SoEFutureFeedback@stanford.edu.
Being part of a liberal arts university is fundamental to the identity of the Stanford School of Engineering.

Currently, SoE collaborates in research and education with all six non-engineering Stanford schools and has undergraduate collaboration programs with three of those schools. Interactions have flourished over the past decade and interest remains strong. SoE Future’s call for new ideas generated over 90 proposals. More than three-quarters of the proposals outlined collaborations with experts outside of engineering.

There is both enthusiasm and a need for more interaction across Stanford schools. Globalization has changed the reach and impact of engineering, and our students must understand the broader implications and constraints of their work, including its effect on different cultures and on the depletion of our natural resources. At the same time, the rising pervasiveness of digital technology and design-centered thinking call for engineering expertise to be more readily available to other fields. The following recommendations can strengthen our ties with the rest of Stanford University.
Engineering has the potential to create global prosperity. We must instill a cultural awareness in our students and provide a more holistic education that encompasses the world at large. To have impact, we must also give students the tools and opportunities to put their skills into action. Accordingly, we recommend:

**Embrace a broader definition of entrepreneur** by creating a visible entrepreneurial project space or an institute with a societal focus (i.e., serving environmental, developing-world and low-income needs). This space will allow students across Stanford to work together to understand people’s needs and experiences, and to develop their ideas in accordance with the complex systems we live in. The long-term potential for technologies to have deep societal impact should not be precluded by opportunities for short-term commercialization.

**Support SoE faculty and student participation** in programs such as the Haas Center’s public-service and community-engagement programs, the Program in Science, Technology and Society (STS), and the Center for Ethics in Society (EIS), among many others. For example, provide a set of competitive, merit-based course assistantships for SoE graduate students to support STS courses and, with an SoE faculty mentor, design a 15-minute online learning module related to the STS course content. Explore opportunities for jointly appointed faculty in EIS and SoE.

**Provide logistical support and more opportunities for researchers** to explore their ideas in collaboration with potential users at field sites (locally and globally). Field sites may also be used for teaching. Examples include exploring water technologies ranging from resource recovery from wastewater at Stanford to novel chlorination systems for Dhaka, Bangladesh.

**Establish a process to coordinate curriculum development across schools**, focusing on the science core that is essential for engineers and thematic coursework that relies on engineering skills, e.g., energy, sustainability and ethical issues in engineering and technology.

Leverage Stanford’s strengths across disciplines to educate global citizens.
Open doors to engineering.

There is high demand by students and researchers across Stanford to connect with faculty experts in engineering (e.g., computation). In many fields, interaction with engineering expertise serves primarily a support function, just as engineers often seek support from outside experts. In other fields, interactions with engineers are leading to new discoveries and advances in both fields. Ways for SoE to support and benefit from strengthening engineering expertise across the university include:

Create a network of innovative maker spaces across campus, building on the success of (and high demand for) our product-realization laboratories. New spaces can be of varying theme, size and flexibility (including "pop-up labs"). Suggested themes include sustainability, art, digital manufacturing, integrated circuits ("IC Shop"), chemical technologies, shared teaching-and-tinkering space, and smart maker spaces incorporating information technology, among others.

Strengthen access to computation and data expertise across the university. The pervasiveness of digital technology in society is giving computation a place within every discipline in the university. We propose to broaden university-wide programs such as those in the Institute for Computational and Mathematical Engineering (e.g., in statistics, applied math) to provide services by graduate students in all areas of computation and data analysis.

Create incentives for engineering faculty to offer introductory seminars and Thinking Matters courses, and to pursue other avenues for students outside of engineering to have exposure to engineering approaches to societal challenges.

Establish a mechanism for a cross-school, standing faculty search specifically aimed at strengthening the application of computation and data analysis techniques to disciplines across the university. Searches would not be tied to specific departments; departmental affiliations would be determined after top candidates were selected.