

A Progression Of Learning-Centered Experiences

Beyond the Tipping Point in the College of Engineering

The College of Engineering efforts toward strengthening our unit to be a Learning-Centered College began over a decade ago, before the phrase "Learning Centered University" gained popularity. The impetus for the changes in the College was the accreditation standards introduced by ABET in the mid-1990s that focused on learning outcomes rather than courses taught, called Engineering Criteria 2000 (EC 2000). The College of Engineering had the option of applying for reaccreditation in 1999 using the old teaching-based criteria or using the new learning-based criteria. The College embraced the opportunity to use the new criteria, and a systematic approach toward being more learning-centered was launched. An integral part of EC 2000 is assessment and continuous quality improvement. The College of Engineering successfully met the standards of EC 2000 in 1999 and again in 2005, demonstrating that learning-centeredness and continuous quality improvement have been institutionalized. Some members of our Industry Action Councils in the college were the industry representatives for developing EC 2000 and indicated that their support of our was strengthened by our leadership of change. It is worth noting that WASC overtly chose to use much of what was developed in EC 2000. .

Background

The College of Engineering and all of its departments have continued to work in concert to measure and improve the learning outcomes of our curriculum. It is likely the strong faculty commitment to self evaluation and is based on their view that education of student majors is something that extends beyond classes, laboratories, and field trips to employment in the profession or additional academic work. For this reason, faculty have always been concerned about what is learned and integrated into the knowledge base of our graduates. Feedback and subsequent adjustment of processes is central to engineering practice. Nevertheless, it is the practice of embracing change that tests ones resolve. We are working identify the important changes needed in every college and department activity to ensure the best possible outcome.

This last ABET visit was quite an experience and really helped faculty and staff come to grips with change since the engineering programs had proposed many assessment criteria **six years before**. It was necessary to get everyone in the college working for several years to gather the data used to make curricular changes and adjust our course. The visiting team of twenty was quite thorough and very pleased regarding our progress. Many in the college believe we have tipped in the right direction but there is still much work to do since change never ends.

As an example, every college event is assessed in terms of outcome and value achieved for the expenses (people time and fiscal) and the opportunities for change. Our own list of events all college events is quite extensive and includes Quarterly Breakfasts, Welcome Fair, Open house, Project Symposium, New Officer Club Training. Each of these events is leveraged to include faculty, staff and students. The dean's suite was constructed with a project room in the middle where the free coffee and an occasional birthday party has led to an amazing number of discussions by faculty, office staff and technical staff. Faculty and staff have much freer discussions than in other venues.

New Ideas

Based on "The Tipping Point" memo we have reviewed our planned actions in light of the eight points listed. All of our events are open to the campus but we will restructure some of the activities to bring in students, faculty and staff so that they can watch and participate in Engineering Meadow events like the ones we did for Science Olympiad. The menu is obviously popular since every Friday, several dozen students can be seen playing Frisbee which is both fun to watch and play.

We are seeking new ways to leverage computers and the web to better engage students without hassle. Current proposals collected from students, faculty, and staff include:

Facilitate students inputting all information for petitions and other documents over the Web (24 x 7). Use web forms so that students and faculty can be better prepared for questions.

Enhance advising by permitting faculty and students to track advising sessions electronically. The following up can also be input and reviewed.

Plan to improve advising by having more information available to students on the CoE webpage including scholarships, REUs, internships, co-ops, projects, and events

We recently implemented permanent user accounts for all engineering students (5,500) so that they can assess any of the 100+ software programs from any engineering computer while on campus.

Faculty already had access as described for students above but we are now in the process of giving faculty this same access from anywhere in the world by using virtual servers. Based on the results and costs we will extend to students.

Several college hallways will be equipped with large scale monitors so students, faculty and staff can get the most recent information on advising questions, feedback on courses, ...

Surveys for student will continue and the results published as above For several months we have been developing a college based FYE course. The teaching load for the course will be shared across the departments, MEP and student affairs. Our intent is to have the course open to other majors that may want to learn about the engineering profession with emphasis on: problem solving as analysis, syntheses, creative insight, documentation, cost of alternatives, team work, and civic engagement (we will partner with corporate groups),

Focusing on traditional problems, we will revise RTP criteria to be consistent with goals of learning centeredness and change for improvement.

The ADVANCE grant will provide needs assessment and activities to improve climate for faculty.

Our existing college meeting system is structured fit with Learning-Centeredness: Continue the regular meetings with OFFCOM (Office Staff), TECHCOM (Technical Staff), and ADCOM (Administrative Committee of Chairs and others). These meetings cross connect and will be used to communicate common issues, identify training needs and to incorporate training into meetings.

Partners (Industry, Corporate, Municipal, Individuals) help college management learn about solutions in other worlds. Recently the IAC asked to have a common "Partner" web area where they could share with each other and with us.

Partners also want to be directly involved with learning opportunities for students and will help fund field trips and the Learn by Doing activities for which we are well known. These experience will encourage students to take charge of these education.

For 18 years the College has assumed an active role in improving and maintaining our facilities and infrastructure for classrooms, laboratories, office and common spaces and surrounding environment. These actions have helped develop the "Engineering Neighborhood" as a community. A related action is the Omni present swipe cards. Students are able to access appropriate rooms 24 x 7 in all three engineering buildings via 250 swipes. The system is actively used and recently promised to incoming Honors Students simply based on their status rather than the traditional request via the department chair.

Collaborations

Engineering along with other colleges have collaborated on GIS related activities and the exhibition of GIS materials has been part of the Project Symposium hosted by engineering for two years. We will expand this and related activities. The College of Science and Engineering are at work on a Bioengineering program with a core group of four faculty but many others will be helping.

CoE will be working with the other CSU engineering programs to develop Project Lead The Way for High Schools in our area. This approach has been demonstrated in San Diego and we have volunteered to be the lead in the inland empire.

The Environment and Budget

The College of Engineering continues to improve the infrastructure and equipment associated with instruction and operations. Our computer network is a monolith of more than 600 computers connected to central servers that support more than 100 separate software suites. Students, Faculty and Staff are supported by this arrangement. Students get a first class experience on a wide variety of platforms and devices connected to the net. Industry (including the CIA) have praised their experiences and subsequent skills developed.

Many new projects are underway and the College has committed funds to promote success. These include expanding distance learning courses and facilitating live communication in many of our classrooms. This is a pilot project that is just getting underway.

Attachments

An 11' x 17" **poster** is attached. It shows much of what we are doing and acts as an aid to put items in perspective.

A 8.5" x 11" **map** shows the Engineering Neighborhood which was developed years ago as a way to encourage family, friends and all others to visit and share some of the wonderful things happening in engineering. The map is given to all incoming students and many lost souls as well. Industry likes it since all department locations and phones are available.

Progression of Learning-Centered Experiences Beyond the Tipping Point in the College of Engineering

Levels of Learning Centeredness

