ITL Project Report
Clearinghouse for Assessment in Engineering
August 10, 2002

Background

The concept of the Engineering Assessment Clearinghouse grew out of the need to share assessment strategies in light of the major changes that have been implemented by the Accreditation Board for Engineering and Technology (ABET). In 1996, ABET developed a set of guidelines (Engineering Criteria 2000) for accreditation that requires programs to incorporate assessment and continuous improvement into their culture and operations. As stated in criterion 2 of the ABET guidelines

"Each engineering program for which an institution seeks accreditation or reaccreditation must have in place:

(a) detailed published educational objectives that are consistent with the mission of the institution and these criteria
(b) a process based on the needs of the program's various constituencies in which the objectives are determined and periodically evaluated
(c) a curriculum and processes that ensure the achievement of these objectives
(d) a system of ongoing evaluation that demonstrates achievement of these objectives and uses the results to improve the effectiveness of the program."

Starting in 2000, all engineering and technology programs seeking accreditation must have assessment plans and show evidence that they are continually collecting data and using it to improve the quality of their programs.

As stated in criterion 3 of the ABET guidelines:

"Each program must have an assessment process with documented results. Evidence must be given that the results are applied to the further development and improvement of the program. The assessment process must demonstrate that the outcomes important to the mission of the institution and the objectives of the program, including those listed above, are being measured. Evidence that may be used includes, but is not limited to the following: student portfolios, including design projects; nationally-normed subject content examinations; alumni surveys that document professional accomplishments and career development activities; employer surveys; and placement data of graduates."

As a consequence of the adoption of Engineering Criteria 2000, engineering programs have struggled with many of the issues of assessment and have made progress in implementing sustainable systems for collecting and analyzing data and incorporating improvements. Programs are eager to share best practices as evidenced by the large number of attendees at meetings where engineering assessment is discussed (e.g. Rose-Hulman assessment meeting). Within the CSU, there are 14 campuses with engineering programs. All programs must be reviewed at least every six years to maintain their accreditation. Because assessment is such an important part of the accreditation process, there is a strong desire in the CSU to share best practices among the engineering programs.

Summary of Activities

All engineering programs in the CSU were contacted to solicit participation in the clearinghouse. Nine campuses indicated interest: CSU Chico, CSU Fresno, CSU Long Beach, CSU Los Angeles, CSU Maritime, CSU Northridge, CSU Sacramento, San Francisco State and San Jose State. At some campuses all programs were represented, while at other campuses only selected programs chose to participate.

The clearinghouse consists of two components: 1) a web site and 2) a list serve.

The web site (**http://www.engr.sjsu.edu/assessment/**) is organized according to CSU campus and engineering discipline. Even though only selected programs chose to participate at each campus, each engineering program at each participating university has its own page (the goal is to provide an easy way for additional programs to participate if they wish). On each program page there is information about program mission, goals, ABET outcomes and assessment as well as a link back to the home page for that program. The clearinghouse site also contains assessment definitions, topics related to engineering assessment (currently this section contains rubrics for evaluating student work with respect to ABET outcomes), links to other assessment sites of interest, links to articles written by faculty about assessment, and a link back to the CSU assessment web site. The clearinghouse web site has been set up so that a user can go directly to a specific CSU or directly to information related to a specific discipline such as civil engineering or mechanical engineering. In a few cases, where information was available, the clearinghouse contains information related to how the College of Engineering is participating in the assessment process.

For each program on each participating campus an attempt was made to gather the following information:

- University and College Missions
- Program mission and objectives
- Student outcomes (e.g. design skills, writing, analysis)
- Assessment tools (e.g. surveys, portfolios, faculty review of samples)
- Schedules (e.g. data collection and program modification cycle)
- Data management (e.g. notebooks, databases, who does what)
- Procedures for feedback and implementation of change (e.g. committees, retreats)

This information was collected through the use of a survey (see Appendix A) and through interaction with representatives from each campus.

Progress to Date

Some programs were very supportive and quickly provided the information we needed. Other programs never sent information in spite of numerous requests. In some of these cases we were able to find selected information from their university web sites. In other cases we have had to leave pages blank for the moment, with the goal of continuing to work with campus contacts. This year (2002-2003) Dr. Anagnos plans to continue working with campuses to collect and post information. We would like to collect more samples of surveys, rubrics, and other useful tools.

The concept of a list-serve to allow faculty to exchange success, failures and best practices has already proved useful. Recently a faculty member asked for rubrics for assessing ABET outcomes and within one day some rubrics were provided and posted on the web site. It is our goal to continue to use the clearinghouse for exchanging ideas.

List of Participating Campuses and Campus Contacts

CSU Chico

Mike Ward – Associate Dean College of Engineering, Computer Science and Technology

CSU Fresno

Nagy Bengiamin – Electrical and Computer Engineering

CSU Long Beach
Mihir Das – Associate Dean College of Engineering
CSU Los Angeles
Ethan Lipton – Associate Dean College of Engineering, Computer Science, and Technology
CSU Maritime
Nader Bagheri – Mechanical Engineering
CSU Northridge
Bob Lingard – Computer Science
CSU Sacramento
Joan Al-Kazily – Civil Engineering
S.K. Ramesh – Electrical Engineering
San Francisco State University
Norm Owen – Civil Engineering
San Jose State University
Thalia Anagnos – Civil & Environmental Engineering and Director of Assessment
Michael Jennings – Chemical and Materials Engineering
Dick Desautel – Mechanical and Aerospace Engineering

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Appendix A – Survey sent to participants

Questions for Members of the Engineering Assessment Clearinghouse

These questions are going to be used to complete the web pages for individual CSU campuses and programs on the Engineering Clearinghouse web site (http://www.engr.sjsu.edu/assessment/).
We would like to have answers to these questions before June 1 but we realize that you are very busy and that you *volunteered* to participate in this clearinghouse, so we will be happy with whatever you can provide. So get us what you can, when you can. It doesn't all have to be delivered at once. You can type in this document and email it back to us if you wish.

If you have posted answers to some of these questions on your web site, or if you have a report you have written that will answer these questions, then just send the web address or the report. This promises to be a comprehensive set of information for those who are participating in engineering assessment to use as a resource. Thank you, thank you, thank you for your contributions to this project.

Thalia Anagnos, Mike Jennings and Dick Desautel
Mailing address:
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Your Name:

Engineering Programs you are representing:

CSU:

1) What year is your next ABET review?

2) Have you previously completed a review under the ABET 2000 guidelines?

3) Have Missions and Educational Objectives been developed for each of the programs you represent? (If yes, please send them in an electronic file or provide a URL)

4) Have program outcomes been developed for each of the programs you represent? (If yes, please send them in an electronic file or provide a URL)

5) Were your program outcomes used in an ABET 2000 review?

6) How are your program outcomes linked to your educational objectives (for example a matrix such at the one on http://www.csum.edu/academics/degrees/tech/me/PEOvsPOgrid.htm)? (Please send an electronic file or a URL of your linkages)

7) Describe your assessment system. For example,

- Do you assess the entire program every semester or some portion? At what frequency?
- How often do you assess each program outcome?

- How are you collecting data? (portfolios, FE results, internal exams, evaluation of samples of student work, evaluation of student internships, exit surveys, alumni surveys, employer surveys, senior projects, other methods)
- Who does the evaluation?
- How do faculty participate in the analysis and program modification?
- How do you close the loop (faculty retreat, curriculum committee, faculty meeting, individual discussions, other?)
- How much release time do faculty get for assessment?

8) Have you established learning objectives for each course?

9) Are these linked to program outcomes?

10) Have you established a sequence of courses that contributes to a particular Program Outcome (sort of like a flow chart showing how outcome is achieved)

11) How do you document your assessment results and report them to your constituents?

12) Do you have any assessment tools or rubrics you would like to share?

13) Do you have any papers you have written related to assessment that you could share with us?

14) Do you have any other issues related to assessment you would like to share.