

Current Assessment and Evaluation Process and Tools

1. Assessment Tools for the Program Educational Objectives

With the adoption of the new Program Educational Objectives, the CEE Department defined and implemented assessment and evaluation processes for determining the extent to which the new Educational Objectives are achieved. The primary assessment instruments of the Program Educational Objectives are as follows:

A. Alumni Surveys

Data collected in Alumni Surveys are used to demonstrate the achievement of the Program Educational Objectives and Program Outcomes. A new survey questionnaire was developed based on the new Program Educational Objectives. The surveys consist of open questions relating to general information on the alumnus and rated statements on the alumnus's job duties and professional accomplishments. There are 62 statements to be rated, 25 of which relate to the Program Educational Objectives, 15 of which are associated with the Program Outcomes, and the remaining 22 tied to CEE faculty, facilities, and quality of course work taken at TTU. The rating system adopted has a 4-point scale, which ranges from a 1 ≡ "Strongly Disagree" to a 4 ≡ "Strongly Agree." A fifth level of 0 ≡ "No Opinion" is an option. A copy of the alumni survey can be found in Appendix B.

(a) One-year Alumni Survey ("recent" graduates)

A One-year Alumni Survey is added as a new assessment instrument to provide data for evaluation of the new Program Educational Objectives. The survey, which targets "recent" graduates, is used to determine the degree of attainment of Educational Objectives #1 and #3. Civil Engineering alumni who are within two years post graduation are sent a set of questionnaires relating to their early career professional growth to respond to. Questions asked relate to: (1) getting a position in the CEE profession or enrolling in graduate school; (2) participating in engineering practice; (3) being mentored by a registered professional engineer; and (4) having confidence for potential professional development. Other statements in the survey are associated with alumni's participation in continuing education and their ability for a sustained level of productivity. The questionnaires also solicit the graduates' responses on whether the CEE program prepared them well for the civil engineering profession.

The performance benchmark established is for at least 80% of alumni respondents to "agree" or "strongly agree" that they have made progress during their early career and that the CEE Program at TTU provided them with adequate preparation for the civil engineering profession. A combined percentage of respondents that "agree or strongly agree" on any survey statement that is less than 50% would generate a concern, which would require a review and actions by the departmental ABET advisory committee.

(b) Six-year Alumni Survey (“experienced” graduates)

The data from the Six-year Alumni Survey are primarily used for the assessment of program Educational Objectives #2 and #3. Five years beyond graduation, the CEE graduates will be sent a questionnaire on their professional advancement. The six-year survey solicits the alumnus’s responses on (1) the advancement of their technical knowledge and skills; (2) their involvement in management and leadership roles; (3) recognition received, such as award, promotion and bonus. Similarly, questions on alumni professional development through life-long learning and the continuation of professional registration process are included in the survey.

The performance benchmark established is for at least 80% of alumni respondents to “agree” or “strongly agree” that they have achieved an appropriate level of advancement in their professional career. A combined percentage for “agree or strongly agree” on any survey statement that is less than 50% would generate a concern, which would require a review and actions by the departmental ABET advisory committee.

B. Employer surveys

Employer surveys are another tool used for assessment of the Program Educational Objectives and Program Outcomes. The results of employer survey are used to evaluate the degree of attainment of the Program Educational Objectives, and ascertain the level of preparation of graduates for the current position they hold. There are a total of 26 statements to be rated, 12 of which are related to the Program Educational Objectives, with the remaining 14 tied to the Program Outcomes. The rating system has a 4-point scale that ranges from a 1 ≡ “Strongly Disagree” to a 4 ≡ “Strongly Agree.” A fifth level of 0 ≡ “No Opinion” is an option. A copy of the employer survey can be found in Appendix C. The employer survey is sent out to selected employers of CEE graduates after the alumni survey comes to an end. As part of the alumni survey, the CEE graduates provide the names and contact information of their immediate supervisors, which helps the Department identify the appropriate employers to whom to send the survey.

The recommended performance benchmark is that at least 80% of employers responding to the survey “agree” or “strongly agree” that the TTU alumnus employees are productive and effective in engineering practice and management. A lesser rating on each response would trigger a concern, which would call for a review and actions by the Department ABET advisory committee.

C. The Department Advisory Board Assessment

From time to time, the CEE Department Advisory Board is surveyed or is consulted on matters related to Program Educational Objectives, Program Outcomes, curriculum, assessment tools, and performance of graduates. The recent involvement of the Advisory Board on revising the Program Educational Objectives is an example of the Advisory Board assessment activities. No metric is assigned.

D. FE Results

The FE exam is an assessment tool for CEE Program Outcomes. Moreover, it is also used in evaluating the degree of attainment of the Program Educational Objectives. Objective 3 of the CEE Program Educational Objectives states that “Graduates should develop professionally through a commitment to life-long learning”, which is further explained that “the graduates should continue the professional registration process if necessitated by employment”. The FE Exam is the first step toward professional registration of graduates entering the civil engineering profession. All CEE graduating seniors at TTU are required to take the FE exam during the last semester of their senior year. Passing the FE Exam enhances the qualification profile of a CEE graduate, making the graduate more attractive to potential employers and therefore helping the graduate secure employment in civil engineering to begin his/her early career professional growth. This early career professional growth is the first Objective (Objective #1) of the CEE Program, which states, “Graduates should demonstrate the ability for early career professional growth based on their grasp of fundamental concepts in civil engineering”. Consequently, the FE exam results do help demonstrate achievement of these program educational objectives.

In the analysis of the FE Exam results, the performance of TTU CEE graduates is compared to that of their peers at the state and national levels respectively. The criterion for judging the performance on the exam to be acceptable is for the “average pass rate” of CEE students taking the exam for the first time to meet or exceed the national average. This “average pass rate” used in the comparison is a four consecutive semester running average of the CEE pass rate. A lesser rating would trigger a concern, which would call for a review and actions by the Department ABET advisory committee.

2. Evaluation of the Program Educational Objectives

The evaluation of the Program Educational Objectives is conducted in various settings that include ABET committee meetings, faculty meetings, meetings with students, meetings with the CEE Advisory Board, and feedback obtained from students through course and program assessments. Moreover, a process is in place to evaluate the relationship between courses in the curriculum and the desired Program Educational Objectives and Outcomes. This process has enabled the CEE Department to ensure that the present curriculum fully supports the desired Educational Objectives and Program Outcomes; subject to continuous verification, evaluation, and improvement by appropriate assessment.

The CEE Department is committed to making the process operate in the best interest of its constituents and to utilizing the data generated from various survey instruments to continually refine the Educational Objectives and delivery of the program in order to make the academic experience for all concerned as worthwhile as possible.