AMERICAN BOARD OF ENGINEERING AND TEACHNOLOGY ABET

http://www.abet.org/pev-refresher-training-module4/#

A. Terms and Definitions Used by ABET

Unfortunately, there is no universally accepted set of terms that are used in the assessment field. The table below defines the terms used in the ABET Criteria and defined in the Accreditation Policy and Procedure Manual.

ABET Terms	Definition
Program Educational Objectives	Program educational objectives are broad statements that describe what graduates are expected to attain within a few years after graduation. Program educational objectives are based on the needs of the program's constituencies.
Student Outcomes	Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program.
Assessment	Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes and program educational objectives. Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the objective or outcome being measured. Appropriate sampling methods may be used as part of an assessment process.
Evaluation	Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the extent to which student outcomes and program educational objectives are being attained. Evaluation results in decisions and actions regarding program improvement.

B. Assessment and Evaluation of Program Educational Objectives

Program educational objectives focus on what graduates are expected to attain within a few years after graduation. There are two major aspects in the assessment and evaluation of program educational objectives.

The first aspect of the assessment of program educational objectives is related to the appropriate monitoring of the currency of the objectives themselves. Programs that are in disciplines that are dynamic and rapidly changing will need to have more frequent monitoring cycles to be sure that the program educational objectives are current and that the student outcomes will enable the attainment of the objectives. Information on the needs of constituents for the development of the program educational objectives should be gathered in meaningful ways. Determining compliance with this aspect of Criterion 2 will take informed judgment on the part of the evaluator.

The second aspect of the assessment is the degree to which the program has effective processes in place to evaluate the achievement of the program educational objectives. In making this evaluation it is important to note that the nature of the program educational objectives and the appropriate methods for assessing their achievement will vary among programs of different size and with different missions.

The majority of graduates of some programs will go directly into the workforce, while other programs will place a majority of their graduates directly into graduate school. Programs that produce a small number of graduates will have different challenges for data collection than programs with a large number of graduates.

Determining whether a program has complied with Program Educational Objectives (Criterion 2) and Continuous Improvement (Criterion 4) related to program educational objectives requires making judgment in the context of the program. For example, if a program has few graduates, it may not have a large number of responses to an alumni survey.

It may be necessary for these programs to rely on additional sources for data collection as a primary means of effectively evaluating the attainment of program educational objectives (e.g., advisory boards, recruiters, etc.). When evaluating the compliance with the criterion related to program educational objectives, the program evaluator must judge whether the program has appropriate assessment and evaluation processes and is making a reasonable effort to monitor and evaluate graduates' achievements related to the program educational objectives. This is generally done through surveys of alumni and employers (when possible).

Because program educational objectives focus on attainment of graduates, it is difficult to get direct evidence of their knowledge, skills, and behavior. Employer feedback is valuable, but it is often difficult to obtain a response rate sufficient to be able to make any significant conclusions. However, because surveys of graduates do not present a high risk situation for the respondents, it can be assumed that graduates' responses relative to professional achievements are objective and a fair representation of attainment of objectives. Also, graduates have work experience and are able to provide realistic feedback on their preparation to meet the program educational objectives. For program educational objective assessment purposes, well-constructed surveys can provide meaningful data for the evaluation of the degree to which objectives are being attained. If you are interested in more information on principles of good survey construction read **this brief article (PDF).**

Program educational objectives should be assessed periodically. The time span will depend on the number of graduates and the changeability of the objectives. Generally program educational objectives are assessed every two or three years. However, some programs choose to use a yearly cycle, assessing only graduates from certain cohorts (e.g., 1st year out, 3rd year out, 5th year out).

Please Note: Not all programs are equal in terms of the way they can assess achievement of their Program Educational Objectives. It is important to take into consideration:

- Size of program
- Program mission
- Access to graduates

C. Assessment and Evaluation of Student Outcomes

For student outcomes, the focus of the data collection is to answer the question, "Can the program demonstrate the level to which students have attained the anticipated student outcomes?" The evidence of student learning is then used to identify student strengths and weaknesses related to each of the student outcomes for the purpose of making decisions about how to improve the **program** teaching/learning processes. This evidence should be

the product of faculty reviewing and/or observing student work related to the program requirements. In preparation for reviewing a program's processes related to Criterion 4, Continuous Improvement, for student outcomes, it is important to understand several principles of a well-constructed process to enable continuous improvement related to program-level student learning.

1. **The focus of Criterion 4 (continuous improvement) is on the assessment of the program, not on the assessment of individual students.** Assessment of the attainment of student outcomes and program educational objectives at the program level focuses on the performances of selected student and graduate cohorts. A program faculty gains insights into how well it is developing its outcomes through the evaluation of student outcome assessment results for the selected student cohort. Assessment and evaluation of program educational objectives provides information concerning the extent to which the selected graduate cohort has attained the program educational objectives. Moreover, the activity of assessing and evaluating program educational objectives provides the opportunity to examine the adequacy of the process in place for systematic review of the objectives by constituents for currency and relevance, as required in Criterion 2. In general, results are reported in terms of the percentage of students in the student cohort who meet the program's student outcomes and the percentage of program graduates in the graduate cohort who meet program educational objectives performance targets. The program's interpretation of the results informs decision making for continuous improvement purposes.

2. **The focus of Criterion 4 (continuous improvement related to student outcomes) is on the learning of students and not the assessment or evaluation of individual courses.** At the program level, assessment and evaluation should be focused on the learning that has resulted from the experiences in the program by the time of graduation. The purpose is to provide information on the program's efficacy (its ability to achieve what it was designed to achieve).

3. **Student outcomes should be defined in order for faculty to have a common understanding of the expectations for student learning and to achieve consistency across the curriculum.** Well defined student outcomes also communicate to students what learning will be expected as they progress through the program. Without agreed upon definitions of the student outcomes, faculty may have widely varying understandings of what constitutes performance of a given outcome. When faculty have variable definitions of the student outcomes, it almost impossible to determine the extent to which a student cohort has attained the outcomes. One way to establish a common and consistent understanding of what constitutes measurable performance of a student outcome is for those faculty involved to develop a few performance indicators for each student outcome. For further information on writing performance indicators, see the BONUS reading **Student Outcomes and Performance Indicators (PDF)**.

4. **A program does not have to collect data on every student in every course to know how well it is doing toward attaining student outcomes.** As a matter of fact, a program does not have to collect evidence of performance on every student. Because the focus of the assessment activity is on the program and not individual students, it is important that the cohort being used for data collection be representative of the range of students in the program. If a sample is drawn from the cohort, it must include the same proportion of student characteristics (e.g., grade averages, gender, diversity, etc.) that describe the program's student population. In programs that have a small graduation class, sampling may not be appropriate. However, if data are collected on a specific student outcome only every three years (see #5 below) a program would, in fact, be sampling regardless of cohort size as it is not collecting data on every student who leaves the program.

5. **To provide evidence of attainment of student outcomes by the time of graduation for program reporting purposes, programs may choose to evaluate and report only data collected in core upper-level courses.** Although not required by the accreditation criteria, a best practice is to sample from strategically selected core courses toward the

end of the curricular cycle (meaning those where the most representative sample of student attainment of outcomes can be gathered). There are many reasons why programs may choose and should choose to collect data (baseline or other) in the lower-level courses over which they have control for their continuous improvement, but for the most part it is sufficient to choose from upper-level courses for ABET reporting purposes. In general, knowledge, skills or behaviors that students demonstrate in lower-level courses aren't as likely a result of the program's discipline-specific curriculum.

6. **A program does not have to assess every outcome every year to know how well it is doing toward attaining student outcomes.** One approach that often leads to difficulty is to collect too many data on individual students. This is certainly true if a program is requiring that faculty collect data in every course where student outcomes are being "covered." Not only does this make the data collection process cumbersome, but it also makes it almost impossible to turn the data into useful information. A viable alternative data-collection approach is to use assessment cycles where, on a rotating basis, performance-indicator data for a portion of the student outcomes are sampled from two, or preferably three, core upper-level courses where the outcomes are "covered." Using this approach produces evidence that can be used for evaluation and decisions about actions that should be taken, and also relieves faculty of unnecessary data collection. Staggering the data collection over the six-year accreditation cycle produces a process that is continuous and systematic. For an example of a continuous data collection process, **click here**.

7. **The focus is continuous improvement based on information for decision making, not just data collection (i.e., data ≠ information).**ABET accreditation criteria mandate that program faculty focus on continuous improvement using documented processes for assessing and evaluating attainment of program educational objectives and student outcomes. The faculty member time and data collection requirements of these assessment processes should be consistent with day-to-day operation of the program, and the faculty should maintain these processes of assessment and subsequent evaluation across the interval between successive accreditation visits. Assessment processes that focus on the continuous improvement of the program produce results that can be systematically used by faculty and administration in meaningful ways.
Underlying Principles of Continuous Quality Improvement of Student Learning at the Program Level

1. The focus of Criterion 4 (continuous improvement related to student outcomes) is on the learning of students and not the assessment or evaluation of individual students.
2. The focus of Criterion 4 (continuous improvement related to student outcomes) is on the learning of students and not the assessment or evaluation of individual courses.
3. Student outcomes should be defined in order for faculty to have a common understanding of the expectations for student learning and to achieve consistency across the curriculum.
4. A program does not have to collect data on every student in every course to know how well it is doing toward the attainment of student outcomes.
5. To provide evidence of attainment of student outcomes by the time of graduation for program reporting purposes, programs may choose to evaluate and report only data collected in courses towards the end of the curricular cycle.
6. A program does not have to assess every outcome every year to know how well it is doing toward the attainment of student outcomes.
7. The focus is on continuous improvement based on information for decision making.

D. How do I know if a program has an adequate continuous quality improvement process for student learning?

Evidence of a CQI process would contain the following:

1. A timeline of repeated activities related to assessment and evaluation.**Possible question: "What is your data collection and evaluation timeline?"**
2. Agreed upon definitions of student outcomes. (Identifying a few performance indicators per outcome is an effective way to develop measurable definitions.) **Possible question for faculty: "How does your program define its student outcomes to ensure consistent assessment across the curriculum?"**
3. Systematic data collection that focuses on performance related to the student outcomes. **Possible question: "Where do you collect the data that is evidence of the learning of students?"**
4. Systematic data collection that ensures coverage of each student outcome for the given student cohort. **Possible request: "Describe how the data being presented were collected."**
5. Data collection and analysis that provide information that enables faculty to identify superior performance and opportunities for improvement related to the outcomes. **Possible question: "I see that X% of your students have attained outcome Y. Were there any notable positive or negative aspects of the students' performance?"**
6. An evaluation process that clearly communicates to program faculty opportunities for improvement in student learning. **Possible request: "Describe how the proposed actions improved student learning (or are anticipated to improve student learning) related to enhancement opportunities that were identified**.

Assessment Planning

The program assessment planning process is related to the following **ABET Accreditation Criteria**:

- ABET Criteria 2: Program Educational Objectives
- ABET Criteria 3: Student Outcomes
- ABET Criteria 4: Continuous Improvement

Establish Purpose and Set Goals

Institutional Mission Statement

Assessment planning begins with the **institutional mission statement** which describes the communities that are served and the institutional purposes and other characteristics that define the institution.
Develop a Timeline

Each assessment leader, along with any pertinent faculty or administration should develop a plan of action and timeline to ensure departmental goals are met in a timely fashion.

Define and Refine Objectives and Outcomes

Program Educational Objectives

Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. These objectives should be assessed and evaluated periodically, where this is generally done through alumni, employer, recruiter, and/or advisory board assessment. The objectives

should be evaluated on a systematic basis to determine their continued relevance to the needs of constituents.
Student Outcomes

Student outcomes are succinct statements that describe what students are expected to know and be able to do by the time of graduation. These outcomes relate to skills, knowledge and behaviors that students acquire as they progress through the program.
Student outcomes should be defined in order for faculty to have a common understanding of the expectations for student learning and to achieve consistency across the curriculum, as measured by performance indicators. Performance indicators represent the knowledge, skills, attitudes or behavior students should be able to demonstrate by the time of graduation that indicate competence related to the outcome.

Design and Conduct Assessments

Educational Practices and Strategies

Understanding the alignment between educational practices and strategies promotes efficient and effective assessment practices. This can be accomplished by mapping educational strategies (which could include co-curricular activities) to learning outcomes.

Data Collection

Strategies for data collection and analysis need to be systematic and consistent that focus on assessment related to the performance indicators.

Evaluate Assessment Findings

Evaluation is the process that is used to determine the meaning of the assessment results. This includes the implications of assessment results related to program effectiveness and recommendations for improvement in areas of weaknesses. Evaluation should include those who can implement improvement strategies.

Use Results for Decision Making

The feedback process is critical to creating and maintaining a systematic quality assurance system. When successfully implemented, all elements of the quality assurance process interact with one another.