

AAU

Newsletter

Continuous Improvement

It was only in the 2008-2009 EAC accreditation cycle that continuous improvement was introduced as a separate criterion (criterion 4). The present statement of this criterion is:

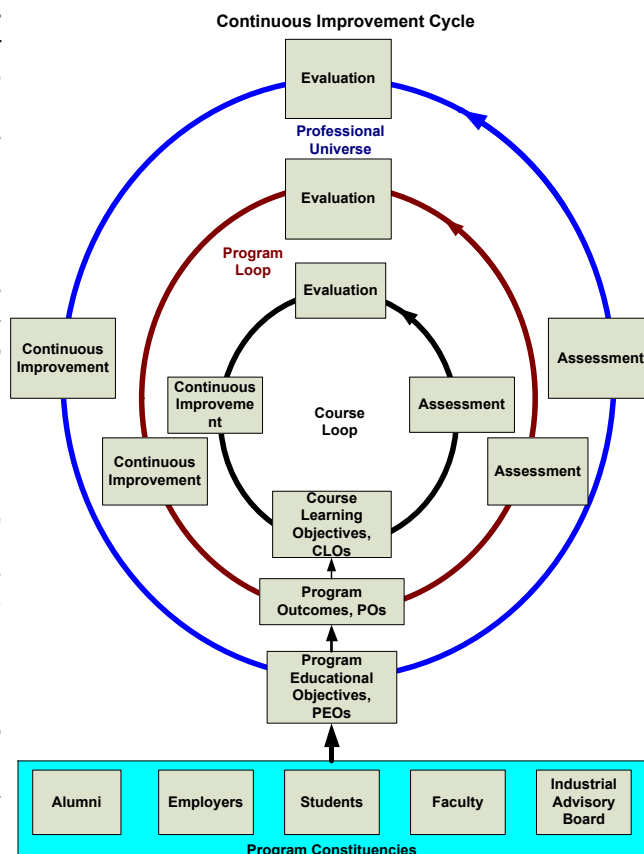
“The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which both the program educational objectives and the student outcomes are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. Other available information may also be used to assist in the continuous improvement of the program.”

Although ABET evaluators are required to review many aspects of the program visited, their evaluation of the program's process for the assessment, evaluation and implementation of identified needed improvements relative to its stated program educational objectives and student outcomes is considered by ABET as an important part of the evaluators' work.

For Program Educational Objectives, there are two major aspects that ABET recommends its evaluators to take care of. The first aspect is related to the appropriate monitoring of the currency of the objectives themselves and their adequacy and suitability to the needs of program constituencies in a changing work environment. The second aspect is the degree to which the program has effective processes in place to evaluate the achievement of the program educational objectives.

When evaluating the compliance with the criterion related to program educational objectives, the program evaluator is required to judge whether the program has appropriate assessment and evaluation processes and should make a reasonable effort to monitor and evaluate graduates' achievements in accordance with to the program educational objectives.

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 program requirements.



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REF: ABET, "Module 4: Continuous Quality Improvement of Student Learning," downloadable from: [http://www.abet.org/ TrainingCD/data/module4/assessmentBasics.htm](http://www.abet.org/TrainingCD/data/module4/assessmentBasics.htm), last downloaded May 18, 2011.

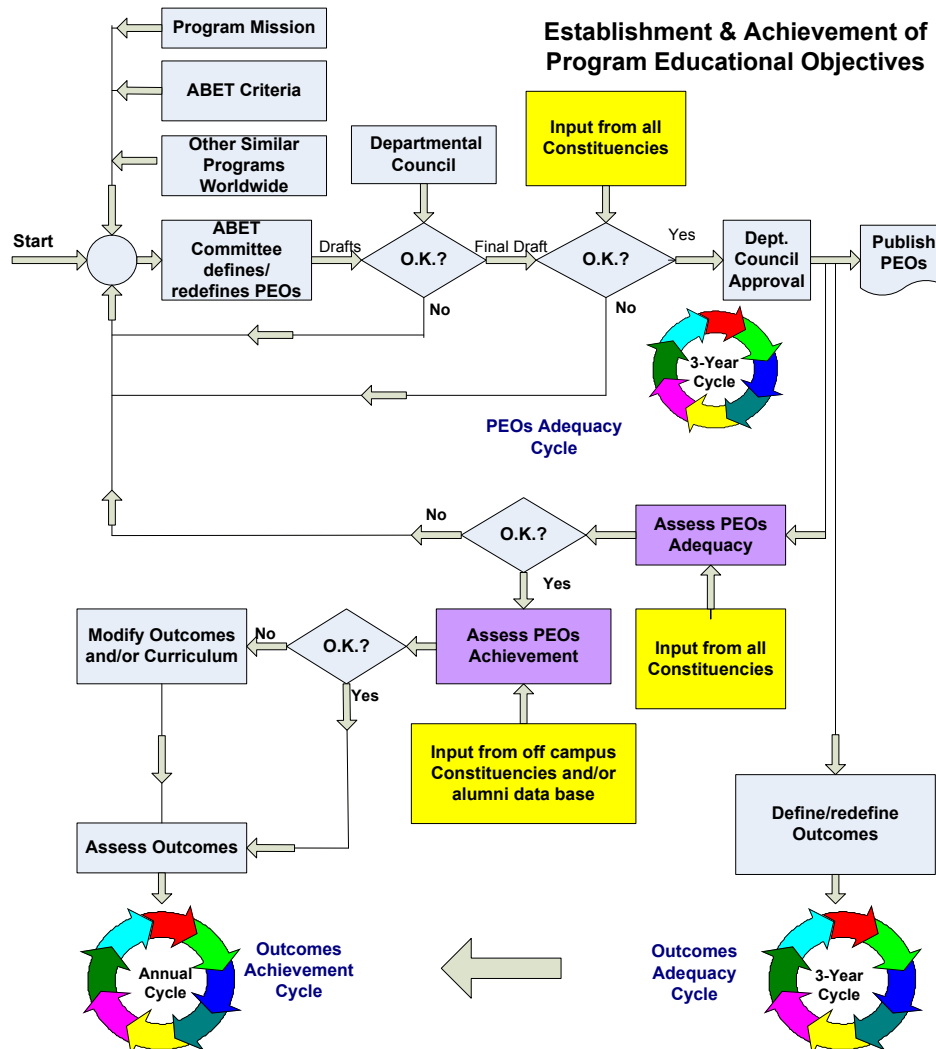
Continuous Improvement (Continued)

Underlying Principles of Continuous Quality Improvement of Student Learning

1. Focus of the continuous improvement process is on the assessment of the program, not the assessment of individual students.
2. Focus is on cumulative learning of students and not the assessment 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. A program does not need more than one data point on each student in the program cohort to determine if the performance has been met.
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.

Evidence of a continuous quality improvement process should contain the following:

1. A continuous timeline of data collection and evaluation activities .
2. Define performance indicators for each student outcome with faculty consensus so that the faculty is assessing them consistently across the program.
3. Systematic data collection that focuses on summative performance related to the indicators.
4. Summative results will have a single data point for each performance indicator for each student.
5. Data that is collected enables faculty to identify student strengths and weaknesses related to the outcomes.
6. Evaluation process focuses improvements on areas of student weaknesses and is communicated to faculty.



Changes ABET-EAC Criteria and Requirements

The New Format	The Old Format
Based on 2011-2012 Review Cycle	Based on 2008-2009 Review Cycle
Evaluation Items	Evaluation Items
DEFINITIONS	DEFINITIONS
ABET has changed the definition of PEO and replaced "Program Outcomes" by "Student Outcomes"	
<u>Program Educational Objectives (PEO)</u> are broad statements that graduates are expected to attain in a few years of graduation. PEOs are based on the needs of the program constituencies.	<u>Program Educational Objectives (PEO)</u> are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve
<u>Student Outcomes (SO)</u> what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program.	<u>Program Outcomes (PO)</u> are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the program.
<u>Assessment</u> 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.	<u>Assessment</u> is one or more processes that identify, collect, and prepare data to evaluate the achievement of program outcomes and program educational objectives.
<u>Evaluation</u> 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.	<u>Evaluation</u> is one or more processes for interpreting the data and evidence accumulated through assessment practices. Evaluation determines the extent to which program outcomes or program educational objectives are being achieved, and results in decisions and actions to improve the program.
CRITERION 1. STUDENTS	CRITERION 1. STUDENTS
The second paragraph is changed to be: The program must have and enforce policies for accepting both new and transfer students, <u>awarding appropriate academic credit for courses taken at other institutions,</u> and <u>awarding appropriate academic credit for work in lieu of courses taken at the institution.</u> The program must have and enforce procedures to ensure and document that students who graduate meet all graduation requirements.	The second paragraph stated as follows: The program must have and enforce policies for the acceptance of transfer students and for the validation of courses taken for credit elsewhere. The program must also have and enforce procedures to assure that all students meet all program requirements.
CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES	CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES
The assessment and evaluation process of PEO are moved to CRITERIA 4.	The assessment and evaluation process of PEO appeared under this CRITERIA 2.
CRITERION 3. STUDENT OUTCOMES	CRITERION 3. PROGRAM OUTCOMES
The outcomes (a) to (k) are still valid. However, the assessment and evaluation process of Student Outcomes are moved to CRITERIA 4.	The outcomes (a) to (k) stated here as well as the assessment and evaluation process
CRITERION 4. CONTINUOUS IMPROVEMENT	CRITERION 4. CONTINUOUS IMPROVEMENT
The program must regularly use appropriate, <u>documented processes for assessing and evaluating</u> the extent to which both the <u>program educational objectives and the student outcomes</u> are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. Other available information may also be used to assist in the continuous improvement of the program.	Each program must show evidence of actions to improve the program. These actions should be based on available information, such as results from Criteria 2 and 3 processes.
CRITERION 5. CURRICULUM	CRITERION 5. CURRICULUM
Two changes are observed: (a) one year of a combination of college level mathematics and basic sciences (some with experimental experience) appropriate to the discipline. <u>Basic sciences are defined as biological, chemical, and physical sciences.</u> One year is the lesser of 32 semester hours (or equivalent) or one-fourth of the total credits required for graduation.	(a) one year of a combination of college level mathematics and basic sciences (some with experimental experience) appropriate to the discipline This line does not appear
CRITERION 6. FACULTY	CRITERION 6. FACULTY
Approximately no change	
CRITERION 7. FACILITIES	CRITERION 7. FACILITIES
Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, accessible, and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. Students must be provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories available to the program. The library services and the computing and information infrastructure must be adequate to support the scholarly and professional activities of the students and faculty.	Classrooms, laboratories, and associated equipment must be adequate to safely accomplish the program objectives and provide an atmosphere conducive to learning. Appropriate facilities must be available to foster faculty-student interaction and to create a climate that encourages professional development and professional activities. Programs must provide opportunities for students to learn the use of modern engineering tools. Computing and information infrastructures must be in place to support the scholarly activities of the students and faculty and the educational objectives of the program and institution.
CRITERION 8. INSTITUTIONAL SUPPORT	CRITERION 8. SUPPORT
Approximately no change	
PROGRAM CRITERIA	CRITERION 9. PROGRAM CRITERIA
Some of the program criteria are changed, for example, the following line is added for Aerospace Program: "Programs must also prepare graduates to have design competence that includes integration of aeronautical or astronautical topics."	



Q & A

In a nutshell what is the difference between Design and Research?

Design is the creative process of identifying needs and devising a product to fill those needs incorporating appropriate engineering standards and multiple realistic constraints. It is an iterative, decision making process that considers alternative solutions, deals with compromise, and optimally applies previously learned Knowledge to meet a stated objective. Design typically involves the integration of knowledge, not the creation of knowledge.

Research, on the other hand, aims at creating knowledge. It is defined as scholarly or scientific investigation or inquiry. It has an open-ended goal and is exploratory, with no set specifications or constraints in mind, and does not necessarily result in a product or a service.

Ref: Gassert, J., and Enderle, J., "Design versus Research in BME Accreditation," *IEEE EMB Magazine*, Vol. 27, No. 2, pp80-85, 2008.

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