Stop Wasting Your Time Assessing Student Outcomes

Focus on Continuous Improvement

Elaine Cooney, Professor, IUPUI
Tom Hall, ETAC Chair-Elect, 2018-19

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Outline

- Changes to the criteria
- Assessment
- Evaluation
- Continuous Improvement

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Changes to Criteria 3, 5, and Program Criteria

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Criterion 3 – Associate Degree

Previous ETAC Criteria	New ETAC Criteria
a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities; b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;	(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;

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Criterion 3 – Associate Degree

Previous ETAC Criteria	New ETAC Criteria
No direct equivalent in current ETAC criteria—"design" added from the International Engineering Alliance (IEA) Dublin Accords Graduate Attribute DA3: Design solutions for *well-defined technical problems* and *assist with* the design of systems, components or processes to meet specified needs ….	**(2) an ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline;**

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Criterion 3 – Associate Degree

Previous ETAC Criteria	New ETAC Criteria
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;	(3) not changed;
c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;	(4) not changed;
d. an ability to function effectively as a member of a technical team;	(5) not changed;

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Criterion 3 – Associate Degree

Previous ETAC Criteria	New ETAC Criteria
g. an understanding of the need for and an ability to engage in self-directed continuing professional development	Omitted
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity	Moved to curriculum
i. a commitment to quality, timeliness, and continuous improvement	Moved to curriculum (~~timeliness~~)

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Criterion 3 –Associate Degree Quick Tracking Matrix

Criteria 3 – Previous Format

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

d. an ability to function effectively as a member of a technical team;

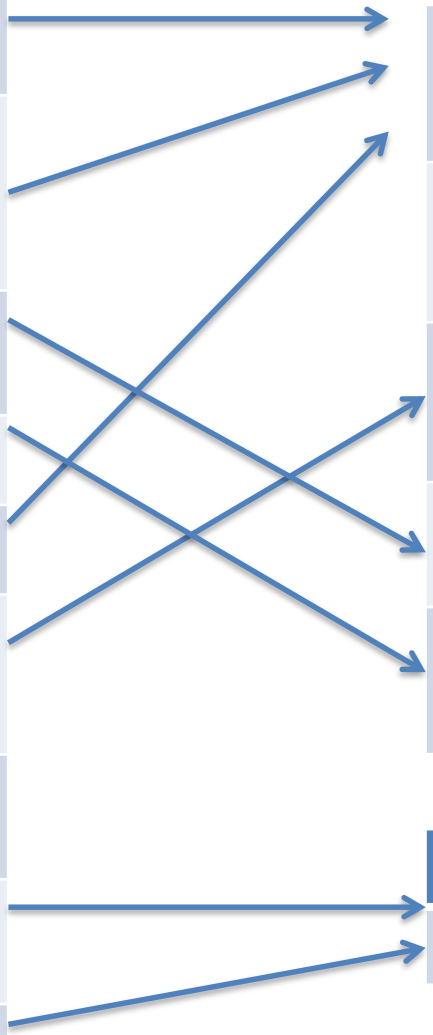
e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

g. an understanding of the need for and an ability to engage in self-directed continuing professional development;

h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

i. a commitment to quality, ~~timeliness~~, and continuous improvement.



Criteria 3 – New Format

(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;

(2) an ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline;

(3) an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

(4) an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

(5) an ability to function effectively as a member of a technical team;

Criterion 5. Curriculum

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Criterion 3 – Baccalaureate Degree

Previous ETAC Criteria	New ETAC Criteria
a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities; b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;	(1) an ability to apply knowledge, techniques, skills, and modern tools of mathematics, science, engineering, or technology to solve broadly-defined engineering problems;

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Criterion 3 – Baccalaureate Degree

Previous ETAC Criteria	New ETAC Criteria
d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;	(2) not changed;
g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;	(3) not changed;

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Criterion 3 – Baccalaureate Degree

Previous ETAC Criteria	New ETAC Criteria
c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;	(4) not changed;
e. an ability to function effectively as a member or leader on a technical team;	(5) an ability to function effectively as a member as well as a leader of a technical team;

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Criterion 3 – Baccalaureate Degree

Previous ETAC Criteria	New ETAC Criteria
h. an understanding of the need for and an ability to engage in self-directed continuing professional development;	Omitted
i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;	Moved to curriculum
j. a knowledge of the impact of engineering technology solutions in a societal and global context; and	Moved to curriculum
k. a commitment to quality, timeliness, and continuous improvement.	Moved to curriculum (~~timeliness)~~

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Criterion 3 –Baccalaureate Degree Quick Tracking

Criteria 3 – Previous Format

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to broadly defined engineering technology activities;

b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

d. An ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives:

e. an ability to function effectively as a member of a technical team;

f. an ability to identify, analyze, and solve broadly defined engineering technology problems;

g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

h. an understanding of the need for and an ability to engage in self-directed continuing professional development;

i. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity;

j. a knowledge of the impact of engineering technology solutions in a societal and global context; and

k. a commitment to quality, ~~timeliness~~, and continuous improvement.

Criteria 3 – New Format

(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems;

(2) an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to the discipline;

(3) an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

(4) an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

(5) an ability to function effectively as a member of a technical team;

Criterion 5. Curriculum

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Criterion 5 – Curriculum

Previous ETAC Criteria	New ETAC Criteria
The curriculum must effectively develop the following subject areas in support of student outcomes and program educational objectives.	Curricular requirements specify topics appropriate to engineering technology but do not prescribe courses. The curriculum must combine technical, professional and general education components in support of student outcomes. To differentiate the discipline, Program Criteria may add specificity for program curricula. The curriculum must include the following:

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Criterion 5 – Curriculum

Previous ETAC Criteria	New ETAC Criteria
Technical Content	**Technical Content**
Added	**d. Include design considerations appropriate to the discipline and degree level such as: industry and engineering standards and codes; public safety and health; and local and global impact of engineering solutions on individuals, organizations, and society;** **e. Include topics related to professional and ethical responsibilities, respect for diversity; and quality and continuous improvement.**

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Comments on Criteria Changes

- Reduces the required number of Student Outcomes
  - Fewer Student Outcomes are required by General Criteria
  - Adds performance indicators for assessment
- Reduces assessment burden
- Moves some of the difficult/impossible to measure items to Criterion 5, Curriculum
- Programs not required to change Student Outcomes to comply*
- * Associate Degree programs compelled to put appropriate “design” (back) into their Student Outcomes. (IEA Dublin Accords)
- Strengthens ties between General Criteria and Program Criteria
- ALL Student Outcomes identified by the program must be assessed. To take advantage of reduced assessment burden, programs must change their outcomes.
- Program must ensure that curricular requirements are met.

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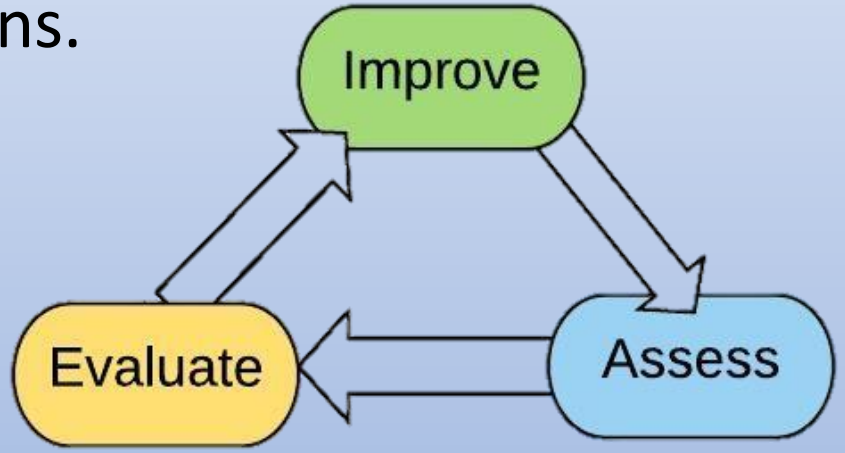
Using Your Time Wisely to Effect Program Continuous Improvement

- The title of Criterion 4 for all commissions is _____ ?
- Many programs collect and present mountains of data yet never get around to continuous improvement actions.
- The cycle is Assess – Evaluate – ***Implement Improvements*** – Assess.
- The emphasis of Criterion 4 must be finding where and how to improve and not on demonstrating that improvement is not needed.
- Criterion 4 demands continuous improvement based on assessment and evaluation.



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Common Issues Found during ABET Evaluation

- Death by Assessment – as characterized by Gloria Rogers
- Not assessing all student outcomes
- Not assessing ONLY student outcomes
- Using only (or primarily using) indirect data
- Not evaluating the data found during assessment
- Not using the results of assessment/evaluation for CI
- Attempting to mask the lack of CI resulting from assessment/evaluation

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Death by Assessment

- Collecting too much data
  - Collecting data in every course—sometimes for multiple outcomes in each course
  - Using multiple surveys
  - Collecting meaningless data (not directly associated with one outcome)
- Collecting data too often (“must regularly use”)
- Collecting but never evaluating data much less implementing improvement
- Using punishment rather than reward as incentive for data collection

- Example: Oral communication. Pick a course (or two) where students are required to make an oral report. Evaluate the presentation for oral communication skills separately from other evaluations such as content.

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Assess the Student Outcomes

- Make absolutely certain that all listed student outcomes are being assessed and keep records to demonstrate assessment
- Avoid assessing more than one thing at a time. Use performance indicators to ensure that a one-and-only-one relationship exists between the outcome and the assessment.

1 : 1

- Example: Oral, written, and graphical communication skills. Pick a spot where oral communication is required and assess independently for oral communication and of content. Do the same for written communication and for graphical communication.

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From ETAC Self-study Template

Student Outcome: __/ *<Program Level Student Outcome>*_____

Performance Indicators (PI) for this outcome	Courses were PI exists (use a simple list)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the PI and related data are collected)	Cycle of When the PI Assessed (how often)	Year & Semester when Data Were Collected	Performance Target for PI
1.						
2.						
3.						
Etc.						

Summary of Aggregated Assessment Data (across all PIs):

Describe how the assessment data from each PI is aggregated and provide an overall assessment data set. Use charts or formulas as necessary but include the numbers of students that were assessed.

Results of Evaluation of Aggregated Assessment Data:

Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.

Actions for Continuous Improvement:

Briefly list the actions for program improvement that have resulted from the results of evaluation processes described above. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes. Details can be provided in the following report section.

Results of Actions for Improvement

Briefly describe the results of any changes (whether or not effective) in those cases where re-assessment of the results has been completed. Details can be provided in the following report section.

Assessment Instruments:

How are the assessment and evaluation results documented and maintained? Attach copies of the assessment instruments or materials referenced in your table. Attach samples of student work at various levels (poor, satisfactory, very good). This can be an appendix or separate file.

From ETAC Self-study Template

Performance Indicators (PI) for this outcome	Courses were PI exists (use a simple list)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the PI and related data are collected)	Cycle of When the PI Assessed (how often)	Year & Semester when Data Were Collected	Performance Target for PI
1. Oral communication						
2. Written communication						
3. Graphical communication						

Summary of Aggregated Assessment Data (across all PIs):

Describe how the assessment data from each PI is aggregated and provide an overall assessment data set. Use charts or formulas as necessary but include the numbers of students that were assessed.

Results of Evaluation of Aggregated Assessment Data:

Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.

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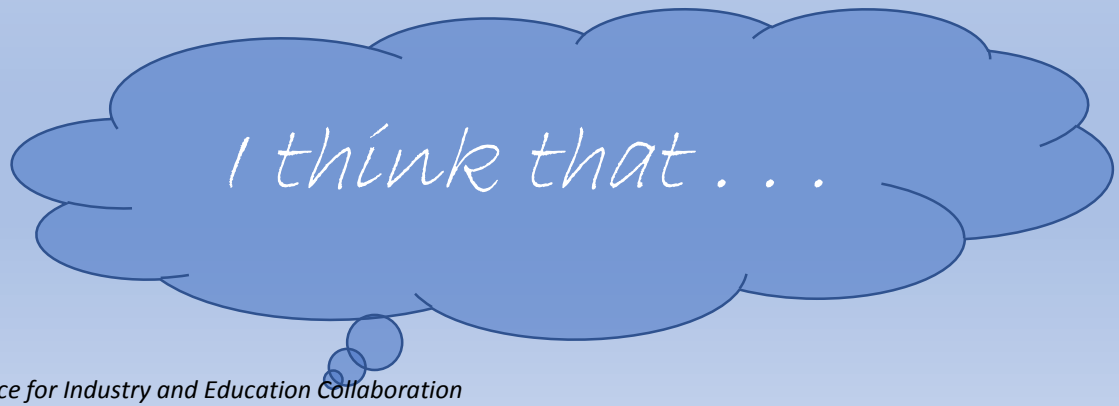
Assessment Data that are not Useful

- Using an instrument that does not represent a one-and-only-one relationship with the student outcome (or performance indicator). The quintessential poor example is using a course grade; but could also be using the grade on a laboratory report as assessment of written communication skills.
- Using data that represent only the opinion the evaluated. Examples are many of the course-end and program-exit surveys.



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Excuses to Avoid Continuous Improvement

- "Setting the bar"
- Averaging
- Fake continuous improvement

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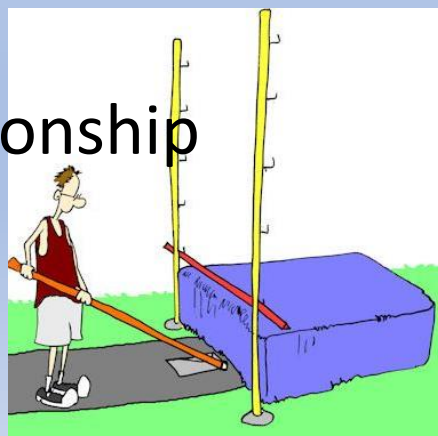
“Setting the Bar”

- “Setting the Bar” (or setting a standard for attainment) is nearly always arbitrary—“pick a standard, any standard”.
- Often, the only “improvement” is to change the level of the bar.
- Student attainment relative to the bar is frequently used as an excuse for inaction.
  - If the bar is set too low, it gives the appearance of “attainment” and does not reveal where improvements could be made.
  - If the bar is set too high, it is difficult to prioritize improvement actions and the reaction is to change the bar.
- Most of the time, evaluation of the raw data (and not its relationship to a “bar”) reveal areas needing improvement.



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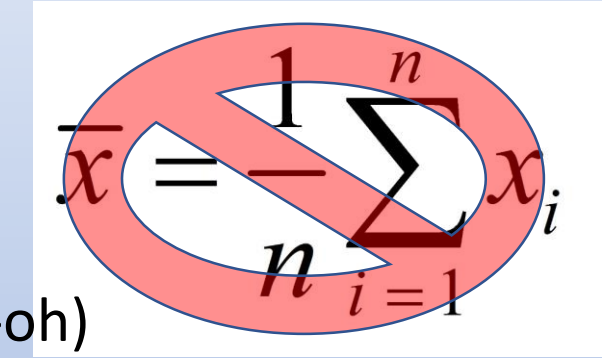
Averaging

- Programs average data, which masks areas where improvements could be made.
- Extreme example. I visited a program where:
  - Data were collected in a course (not a bad start)
  - Data for all the students in the course were averaged (uh-oh)
  - Data for several sections of the same course were averaged (oh my)
  - And finally, data collected in other courses were averaged with these (and)
  - For some amazing reason, evaluated data collected for all outcomes showed a 62.5% attainment across the board.
  - Oh-by the way-they set their bars at 60%. Voila-no improvements needed.



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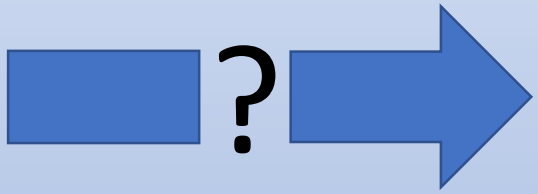
Faking Continuous Improvement

- We collected this mountain of data. (Feel free to spend your Sunday afternoon sifting through it.)



- We've made these improvements (changes) to the program since ABET last visited.

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For more details about assessment & evaluation . . .

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