Dispelling Myths: COMMON Misconceptions about ABET and Accreditation

Charles W. Hickman

Managing Director, Society, Volunteer and Industry Relations

Joseph L. Sussman, Ph.D, F.ASME

Managing Director, Accreditation

2013 ASEE Conference, Atlanta

ABET

Assuring Quality • Stimulating Innovation

The ABET You Think You Know

➢ Specialized accreditation organization for programs in applied science, computing, engineering, and engineering technology

➢ Not-for-profit federation founded in 1932 by seven technical societies. Membership is now 32 societies.

➢ Non-governmental, voluntary, peer-based

➢ More than 3,200 accredited programs at 672 institutions in 24 nations

The ABET You Think You Know (continued)

➢ 2,200 volunteers serve as program evaluators, committee and commission members, Board of Directors, etc.

➢ 38 staff members at Baltimore HQ

➢ Recognized by:

  ▪ CHEA

  ▪ State licensing and recognition boards in 55+ jurisdictions

ABET's 32 Member Societies

ABET Organizational Structure
Volunteer-Driven: 2,000+ *Volunteers*

Board of Directors

- Nominated by member societies
- Provide strategic direction and plans
- Decide policy and procedures
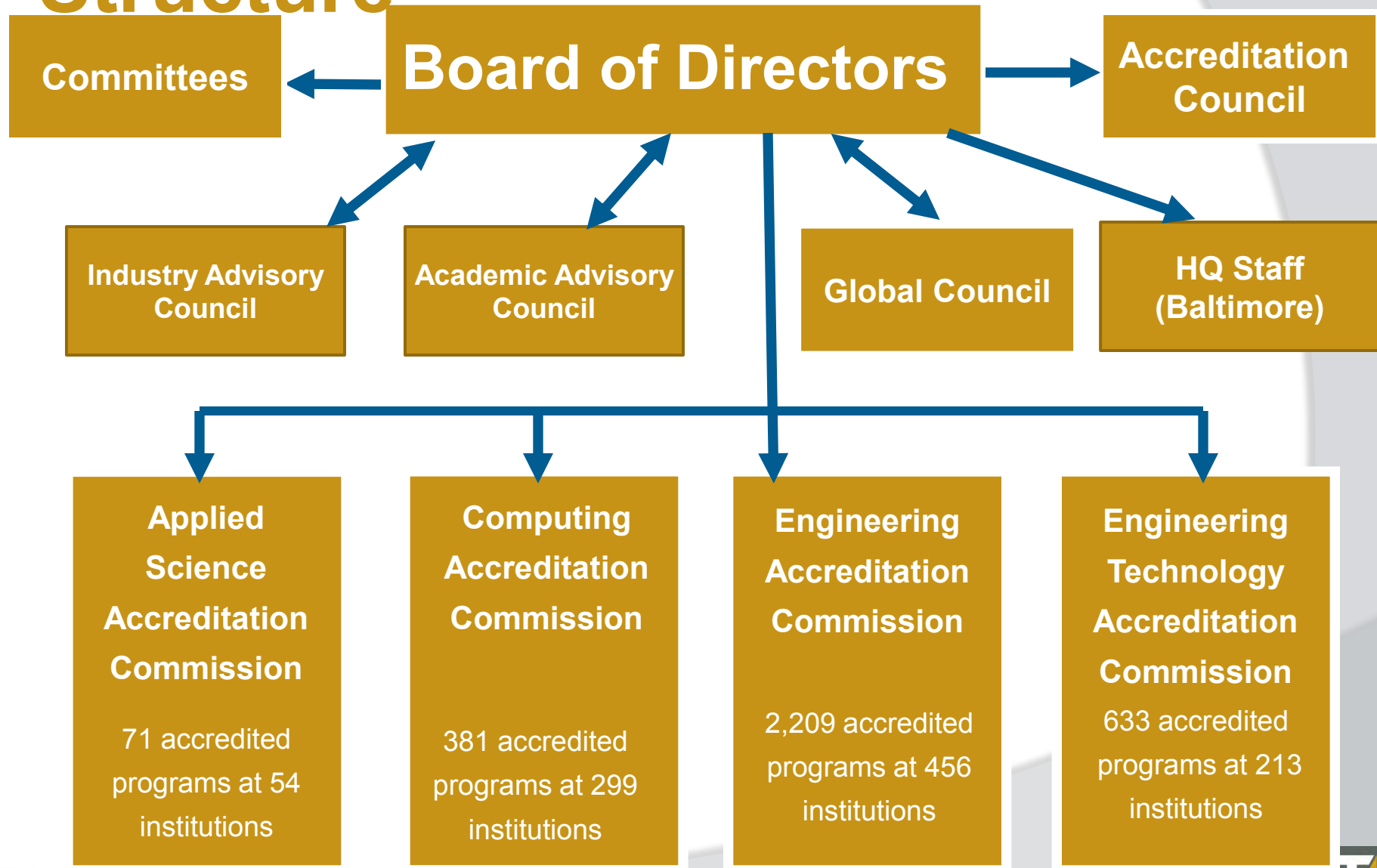- Approve criteria

4 Commissions

- ASAC, CAC, EAC, ETAC
- Make decisions on accreditation status
- Implement accreditation policies
- Propose changes to criteria

Program Evaluators

- Visit campuses
- Evaluate individual programs
- Make initial accreditation recommendations
- "Face of ABET"

100% of accreditation decisions are made by volunteers

ABET
Assuring Quality • Stimulating Innovation

ABET Organizational Structure

Committees

Board of Directors

Accreditation Council

Industry Advisory Council

Academic Advisory Council

Global Council

HQ Staff (Baltimore)

Applied Science Accreditation Commission

71 accredited programs at 54 institutions

Computing Accreditation Commission

381 accredited programs at 299 institutions

Engineering Accreditation Commission

2,209 accredited programs at 456 institutions

Engineering Technology Accreditation Commission

633 accredited programs at 213 institutions

ABET

Assuring Quality • Stimulating Innovation

Accreditation Statistics

➢ Accredited programs by commission:

ASAC: 71   CAC: 381

EAC: 2209   ETAC: 633

➢ 2011-12 Profile:

Commission	Domestic		Non-Domestic	
	Programs	Institutions	Programs	Institutions
ASAC	70	53	1	1
CAC	350	276	31	23
EAC	1950	402	259	54
ETAC	600	207	33	6

Dispelling ABET Myths

Myth #1

➢ ABET only accredits engineering programs

Only Engineering?

TRUTH

- Yes, ABET accredits engineering programs

- But …ABET also accredits programs in

  - Applied Science
    - Associates, baccalaureate and masters levels

  - Computer Science, Information Systems, and Information Technology
    - Baccalaureate level

  - Engineering Technology
    - Associates and baccalaureate levels

ABET
Assuring Quality • Stimulating Innovation

Myth #2

➢ ABET accreditation doesn't provide value to industry, academic institutions, faculty, or students

Value to Industry

- Ensures educational requirements to enter "the profession" are met
- Aids industry in recruiting
  - Ensures "baseline" of educational experience
- Enhances mobility
- Opportunity to help guide the educational process
  - Program's Industrial Advisory Groups
  - Professional, technical societies

Value to Industry

TRUTH

ABET Volunteers come from all types of industries, some examples include …

ABET

Assuring Quality • Stimulating Innovation

3M	Eli Lilly	Northrop Grumman
Aerospace Corporation	ExxonMobil	Oak Ridge National Lab
Agilent Technologies	Ford Motor	Owens Corning
Alcatel-Lucent	General Dynamics	Pratt & Whitney
Alliant Tech Systems	General Electric	Procter & Gamble
Allied Signal	General Motors	Raytheon
Amoco Corporation	Harris Corporation	Rockwell Automation
AT&T	Hewlett Packard	Rockwell Collins
BAE Systems	IBM	Sandia National Lab
Bayer	Lawrence Livermore	Shell Oil
Bechtel Corporation	Lockheed Martin	Siemens
Bell Laboratories	Los Alamos National Lab	Sirius XM
Boeing	Microsoft	Sprint
British Petroleum	MIT Lincoln Laboratory	Software Engineering Inst
Brookhaven National Lab	MITRE	Tektronix
Caterpillar	Motorola	Texas Instruments
Cisco Systems	NASA	Textron
Computer Sciences	National Instruments	USA Army
ConocoPhillips	NIOSH	US Air Force
Delphi Corporation	NIH	US Navy
Dow Chemical	NSF	United Parcel Service
Dupont	NCR	
Eastman Kodak	Nortel Networks	

Value to Institutions

- "Third party" confirmation of quality of programs
- International status
- Recognition by "the profession"
- Helps attract the strongest students
- Acceptability of transfer credits
- Some external funding depends on accreditation status
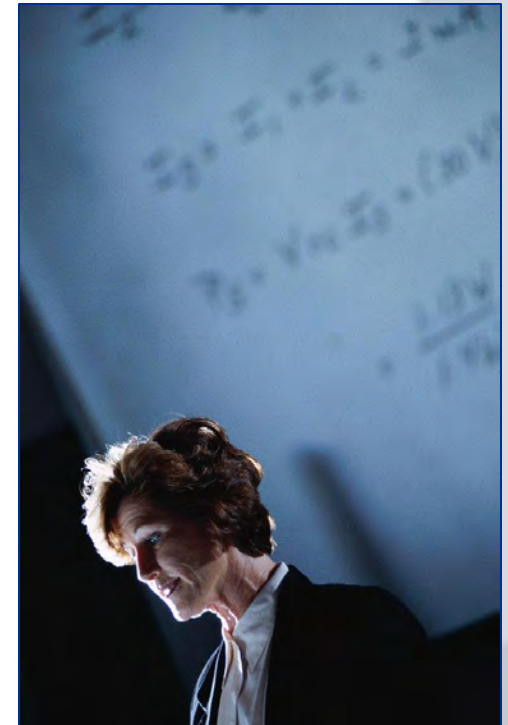
Value to Institutions

TRUTH

ABET volunteers come from all types of institutions, some examples …

AFIT	Georgia Southern	Nebraska	Texas A&M
Alabama	Georgia Tech	NJIT	Texas Tech
Arizona State	Illinois	North Carolina	Tufts
Arkansas State	Iowa State	Northeastern	Tulane
Auburn	James Madison	Northwestern	USAFA
Baylor	Johns Hopkins	Notre Dame	USMA
Boise State	Kansas	Ohio State	USNA
Brigham Young	Kansas State	Oklahoma	Valparaiso
California	Louisiana Tech	Oklahoma State	Vanderbilt
California State	Marquette	Oregon State	Villanova
Carnegie Mellon	Maryland	Penn State	Virginia
Cincinnati	Massachusetts	Pittsburgh	Virginia Commonwealth
Clarkson	Memphis	Purdue	
Clemson	Miami	RIT	Virginia Tech
College of Charleston	Michigan	RPI	Wake Forest
Colorado	Michigan State	Rutgers	Washington
Colorado Mines	Michigan Tech	San Jose State	Washington State
Colorado State	Minnesota	Stevens Institute	Wisconsin
Connecticut	Mississippi State	Stony Brook	Wyoming
Duke	Missouri	Swarthmore College	
Florida	Missouri Univ of S&T	Syracuse	
George Mason	MSOE	Tennessee Tech	
George Washington	Naval Postgrad	Texas	

Value to Faculty

➢ Encourages "best practices" in education

➢ Structured mechanisms for self-improvement

➢ Institution is serious and committed to improving quality

  ▪ Facilities, financial resources, training, etc.

Value to Students

➢ Helps students select quality programs

➢ Shows institution is committed to improving the educational experience

➢ Helps students prepare to enter "the profession"

➢ Enhances employment opportunities

➢ In some cases, establishes for financial aid and scholarships

Myth #3

➢ None of the "big" (or "top") schools worry about accreditation, only the small schools care

Accredited Programs

TRUTH

➤ Programs of all sizes and types have chosen ABET accreditation, some examples include …

ABET
Assuring Quality • Stimulating Innovation

Accredited Programs

TRUTH

Alabama	Duke	Northwestern	Tennessee
Arizona State	Florida	Notre Dame	Texas
Auburn	Georgia Tech	Ohio State	Texas A&M
BYU	Illinois	Olin	USAFA
Cal Berkley	Iowa State	Oregon State	USMA
UCLA	Johns Hopkins	Penn	USNA
U. California (6)	Maryland	Penn State	Vanderbilt
Cal State (16)	MIT	Pittsburgh	Virginia
Cal Tech	Miami	Purdue	Virginia Tech
Carnegie Mellon	Michigan	Rice	U. Washington
Clemson	Michigan State	RIT	Washington U.
Colorado (3)	Minnesota	Rutgers	West Virginia
Columbia	Missouri	USC	Wisconsin
Cornell	NC State	Stanford	Yale

ABET
Assuring Quality • Stimulating Innovation

Myth #4

➤ ABET is "disconnected" from
- Professional practice
- Practical institutional considerations
  - Curriculum structure
  - Instructional methods
  - Financial resources
- It's all about process, not curriculum

Is ABET really "disconnected"?

TRUTH

➢ Remember the organizational structure:

- There is an Academic Advisory Council
  - Membership is drawn from faculty and administrators at a wide variety of institutions
  - This group provides critical input reflecting the academic perspective

- There is an Industrial Advisory Council
  - Membership is drawn from large and small companies and also governmental agencies
  - This group provides critical input reflecting the industrial perspective – professional practice

ABET
Assuring Quality • Stimulating Innovation

Is ABET really "disconnected"?

- ➢ Remember the organizational structure:
  - ▪ Each commission is an operational arm of ABET that carries out the accreditation process
    - Each team has a Team Chair
      - ✓ Team chairs are volunteers who have "day jobs" in academia, industry, and government
    - Each team has Program Evaluators (PEVs)
      - ✓ Program evaluators are also volunteers who have "day jobs" in academia, industry, and government
    - Teams normally have representation from both academia and industry/government as well as gender diversity and ethnic diversity

Is ABET really "disconnected"?

TRUTH

- ➢ Criteria reflect profession's needs
- ➢ How do the criteria change?
  - ▪ It usually starts when proposed Criteria are formulated by ABET Member Societies
    - • So it starts in CSAB, the IEEE, ASME, etc.
  - ▪ Proposed Criteria are reviewed by Commission
    - • First by the commission's Criteria Committee
      - ✓ membership drawn from the commission – both academic and industry/government representation
    - • Then by the full Commission
  - ▪ Public comment is sought and considered
  - ▪ Final approval is by the ABET Board of Directors

ABET
Assuring Quality • Stimulating Innovation

It's More than Just Process

TRUTH

> Criterion 5. Curriculum. The curriculum requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The faculty must ensure that the program curriculum devotes adequate attention and time to each component, consistent with the outcomes and objectives of the program and institution. The professional requirement must include:

- (a) one year of a combination of college level **mathematics and basic sciences** (some with experimental experience) appropriate to the discipline…

- (b) one and one-half years of **engineering topics** consisting of engineering sciences and engineering design appropriate to the student's field of study. The engineering sciences have their roots in mathematics and basic sciences but carry knowledge further toward creative application. These studies provide a bridge between mathematics and basic sciences on the one hand, and engineering practice on the other…

- (c) a **general education** component that complements the technical content and is consistent with the program and institution objectives

Students must be prepared for engineering practice through a curriculum culminating in a major design experience based on knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.

ABET
Assuring Quality • Stimulating Innovation

Myth #5

➢ ABET Criteria for Program Educational Objectives, Student Outcomes, and Continuous Improvement hinder innovation.

Does ABET Hinder Innovation?

TRUTH

- ➢ Observation
  - ▪ In general, innovation is hindered by
    - ✓ Too many rules that tell "how to" do something
    - ✓ Too many rules that specify "what" is to be done
    - ✓ In other words, being **too prescriptive**

ABET
Assuring Quality • Stimulating Innovation

Are the Criteria Prescriptive?

TRUTH

➢ Criterion 2: Program Educational Objectives

- The program must have published program educational objectives that are consistent with the mission of the institution, the needs of the program's various constituencies, and these criteria.

- There must be a documented, systematically utilized, and effective process, involving program constituencies, for the periodic review of these program educational objectives that ensures they remain consistent with the institutional mission, the program's constituents' needs, and these criteria.

Nothing in here that talks about what your objectives should be ..
Build something that makes sense in your context!

ABET
Assuring Quality • Stimulating Innovation

➤ Criterion 3: Student Outcomes

▪ The program must have documented student outcomes that prepare graduates to attain the program educational objectives. Student outcomes are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program.

▪ The program must enable students to attain, by the time of graduation:

- (a) An ability to apply knowledge of mathematics, science and engineering
- (b) An ability to design and conduct experiments, as well as to analyze and interpret data
- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability
- (d) An ability to function effectively on multi-disciplinary teams
- (e) An ability to identify, formulate and solve engineering problems
- (f) An understanding of professional and ethical responsibility
- (g) An ability to communicate effectively
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context
- (i) A recognition of the need for, and the ability to engage, in lifelong learning
- (j) A knowledge of contemporary issues
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Nothing in here that talks about credit hours or courses ..
Do it your way!

ABET
Assuring Quality • Stimulating Innovation

Are the Criteria Prescriptive? NO

TRUTH

- ➢ Criterion 4: Continuous Improvement
  - ▪ The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which 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.

Nothing in here that talks about how to assess or what data must be gathered or how frequently … Of course, if you have data, it needs to be evaluated …innovate!

ABET
Assuring Quality • Stimulating Innovation

Myth #6

➢ ABET requires programs to collect data on all student outcomes on every student every year

Collect data on all outcomes, every student?

TRUTH

- Let's remember what Criterion 4 said about this …
  - The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained.
- And the relevant definition is
  - Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes. Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the outcome being measured. Appropriate sampling methods may be used as part of an assessment process.

ABET
Assuring Quality • Stimulating Innovation

Continuous Improvement is the Goal

TRUTH

- ➢ Your assessment and evaluation process should be sustainable
  - If it is too onerous it won't work
  - You don't have to measure everything all the time
  - More data isn't always better
  - There are many, many ways of doing it
- ➢ Faculty involvement is critical
- ➢ The evaluation component is essential
- ➢ The end result should be improvement of the program
  - Identify opportunities for improvement
  - Design and implement changes
 - Determine the impact of those changes

ABET
Assuring Quality • Stimulating Innovation

Myth #7

➢ ABET Program Evaluators (PEVs) and Team Chairs (TCs)

- Most aren't current in the field or don't do active research, so they don't understand faculty's life at major research institution.

- You need one on your faculty, or you'll have a hard time getting accredited

- ABET doesn't sufficiently monitor and correct volunteer performance

ABET
Assuring Quality • Stimulating Innovation

Currency and Research

➤ >65% of volunteers come from academe
  ▪ Many from major research institutions

Government: 1.5% (23)

Other: .9% (14)

Industry: 30% (460)

Academe: 67.5% (1,034)
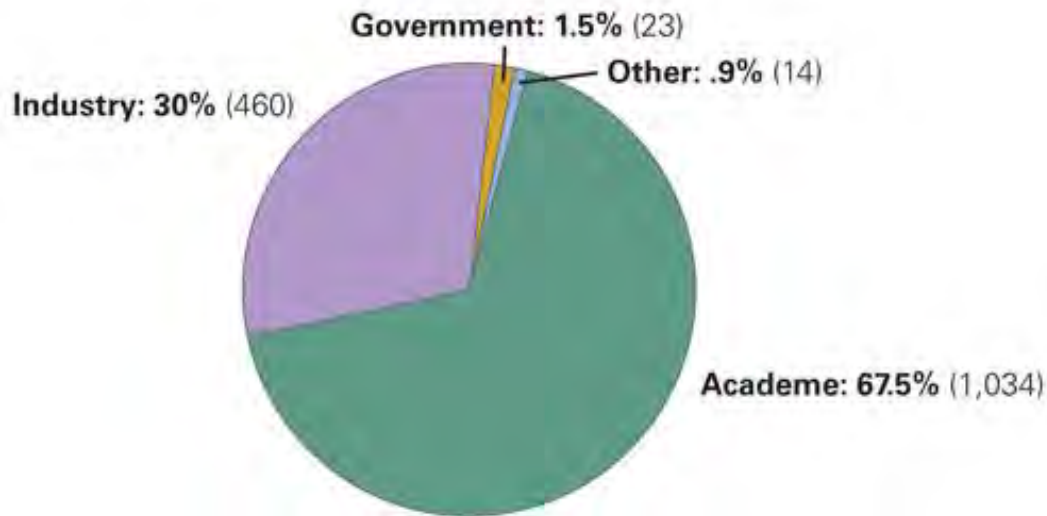
ABET Volunteers

Available resources: you don't need PEVs on your faculty

TRUTH

Program Assessment Workshop

Intensive, Interactive 1-day Workshop

ABET SYMPOSIUM

- Spring of each year
- Over 80 Sessions
- Four educational tracks
- Accreditation Track
- Resource Room – example Self-Studies

ABET Webinars — Log on and Learn

- Various topics
- Multiple offerings

Website: *www.abet.org*

IDEAL™

Institute for the Development of Excellence in Assessment Leadership (IDEAL)

ABET — Assuring Quality • Stimulating Innovation

Quality control of evaluators is critically important to ABET

TRUTH

- ➢ Program Evaluators (PEVs) and Team Chairs (TCs) are expected to conform to ABET's PEV Competency Model
- ➢ From time to time, an institution reports that an individual's conduct is not consistent with these competency models
  - ▪ ABET staff and the Commission leadership engage in a process of determining what did occur
  - ▪ The individual involved becomes involved in understanding what he or she should do to improve performance

ABET
Assuring Quality • Stimulating Innovation

Quality Control: Program Evaluators

TRUTH

- ➤ ABET societies nominate PEVs, using competency model

- ➤ Intensive online and face-to-face training is required

- ➤ Societies have mentoring programs

- ➤ After each visit, each PEV is evaluated by:
  - ▪ TC, fellow PEVs on team, department head of program visited

- ➤ The Commission's executive committee reviews performance on an annual basis
  - ▪ PEVs who are subject to removal are not assigned again
  - ▪ PEVs who are subject to remediation are not assigned until remedial action has been taken by the relevant society

ABET
Assuring Quality • Stimulating Innovation

Quality Control: Team Chairs

- ➢ ABET societies nominate TCs
  - ▪ Have access to each nominee's performance evaluations
- ➢ Each Commission has a Nominating Committee
  - ▪ Some nominees are rejected on the basis of available data
- ➢ After each visit, each TC is evaluated by:
  - ▪ PEVs on the team, department head of the program visited
  - ▪ The editors who handled the reports of visits the TC chaired
- ➢ The Commission's executive committee reviews performance evaluations of all TCs on an annual basis
  - ▪ TCs whose performance does not meet expectations are counseled for remediation
  - ▪ The executive committee has the authority to reject the re-nomination of a TC if appropriate

Quality Control

➤ Each Commission has a Training Committee
- Continually develop improvements in training and monitoring the effectiveness of that training

➤ Most of the general criteria are now harmonized across the commissions
- Forms and processes are harmonized
- Self study templates are harmonized

➤ Quality management processes are being put in place
- Some quality management practices have been in use for some time – recently, these have been codified
- The commissions actively share best practices in a regular basis

➤ ABET listens to its constituencies
- Most recent example: the changes in Criterion 2 and Criterion 4

ABET
Assuring Quality • Stimulating Innovation

Myth #8

➢ ABET's only concern is program accreditation in the United States

ABET is Globally Engaged

➢ Globalization of applied science, computing, engineering, and engineering technology has driven new demand for ABET accreditation from non-domestic programs

➢ ABET now accredits 324 programs at 64 institutions in 23 countries outside the US

ABET
Assuring Quality • Stimulating Innovation

ABET is Globally Engaged

➤ Memoranda of Understanding with 15 national agencies

➤ Mutual Recognition Agreements

- Engineers Canada

- Washington, Sydney Accords (Engineering), 14 nations

- Seoul Accord (Computing), 8 nations

- Dublin Accord (Engineering Technicians, 2 year), 5 nations (provisional member)

➤ Membership in global education organizations

- Global Engineering Deans Council (GEDC)

- International Federation of Engineering Education Societies (IFEES)

ABET
Assuring Quality • Stimulating Innovation

Myth #9

➤ ABET doesn't accredit "on-line" programs

ABET and Online Program Delivery

TRUTH

➢ All programs evaluated against criteria, <u>regardless</u> of method of delivery

➢ Nine fully on-line programs currently accredited by ABET

➢ Noteworthy

- All programs have some online content – broad spectrum of hybrid - total online delivery

- Good example of innovation

ABET Needs Program Evaluators!

- There is a critical need for good PEVs
  - Across all 4 Commissions, there are on the order of 850 programs visited each year
  - Needed: 2,500 PEVs by 2015
    - Biggest demands are biomedical, computing, most engineering technology fields, civil, electrical, and mechanical
- All you have to do is go to the ABET Web site and apply (*www.abet.org*)
  - Your home society will process the application

Questions?

Thank you for your participation!

Charles W. Hickman
Managing Director, Society, Volunteer and Industry Relations, ABET
cwhickman @abet.org

Joseph L. Sussman, Ph.D, F.ASME
Managing Director, Accreditation, ABET
jsussman @abet.org