Assessment: Getting Your Organization into the ABET Accreditation Mood

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ABSTRACT

ABET is the primary accreditation organization for engineering programs in the US. Recently it has expanded work abroad with non-domestic accreditation visits. Assessment is a key facet of the new ABET accreditation model. Having the right attitude for assessment is a key start down the path to accreditation. In this paper we will provide some simple steps to getting into the right mindset and along the way provide concrete examples from our computer science program.

Keywords: Assessment, Accreditation, ABET

1. INTRODUCTION

ABET celebrated its 75th anniversery in 2007. It started out in 1932 known as the Engineers Council for Professional Development (ECPD) and consisted of seven engineering societies. Its mission was to build up engineering as a profession. ECPD focused in four areas: guidance, training, education and recognition. It provided guidance by supplying information to engineering students about the engineering profession. The ECPD also developed training plans for both personal and professional development. In the area of education, it provided appraisals of engineering curricula and maintained a list of accredited curricula. And finally, the ECPD developed methods for individuals receiving recognition for their accomplishments as an engineer (ABET, 2008).

Although it was not part of it's original charter, ECPD evaluated its first engineering degree program for accreditation in 1936. Within fifteen years, it has evaluated over 580 programs. Over the next four decades, ECPD continued to expand its accreditation role both domestically and internationally. In 1955, it accredited a graduate engineer program in Canada. However, ECPD's international activities increased significantly at the end of the 70's when it signed its first mutual recognition agreement with the Canadian Engineering Accreditation Board. The beginning and end of the 80's marked important steps for the organization. In 1980, ECPD changed its name to the Acreditation Board of Engineering and Technology. Additionally, by 1989, it had solidified its role as an international accreditation player by participating as an evaluator for "substantiail equivalence" for international programs and as a founding member of the multinational Washington Accord. (ABET, 2008)

In 1997, ABET formally adopted Engineering Criteria 2000 (EC2000). This marked a significant in that instead of focusing on what was taught, evaluators are more concerned with what is learned. This change also addressed some of the shortcomings that member societies had voiced over the previous years with the accrediation process. Different from previous models which were quite stringent and 'check-list' oriented, EC2000 requires a program to show that it has clearly defined objectives and an assessment process that is continually improving the program with respect to its objectives. Hence, the assessment process, and its documentation, moved became a critical step in the accreditation process with EC2000. In turn, faculty member attitudes toward assessment was just as important to their knowledge of things to do.

2. STEPS TO GETTING INTO AND STAYING IN THE ASSESSMENT MOOD

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In this section, we will discuss specific steps you can take to get and keep your faculty in the assessment mood. We first focus on things to do then cover pratfalls that you should avoid.

2.1 THINGS TO DO

2.1.1 CONVINCE YOURSELF

If your program is initiating an assessment program or trying to improve it, first take some time to understan why you are doing it. What is your goal for developing an assessment program? How will it help your program? Ensure that the answers are clear to you. Remember that assessment is a journey, not a destination. As your are traveling through your journey, it is critical that you are clear why you started in the first place.

If the primary reason you are developing an assessment program is to achieve ABET accreditation, then this should be a indication that something is awry. We recommend that you investigate the many benefits a continuous improvement process provides a program. If you can find no strong reason to develop an assessment process than ABET accreditation, then we suggest you put your assessment plans on hold. Having ABET accreditation as the primary benefit for having an assessment program could be a path toward failure.

2.1.2 ENSURE THAT THERE ARE RESOURCES AVAILABLE

If you have convinced yourself of the benefits of an assessment process in your program, another important step is to ensure that resources are available. This may entail explaining to your institutional leadership the extensive benefits of a robust assessment program. Institutional support is important for an assessment program. No assessment process will succeed without the proper level of resourcing. This may be money for training or compensation time for assessment duties. Regardless the type of resources needed, the resource decision-maker needs to buy-in completely to an assessment program.

2.1.3 GAIN FACULTY BUY-IN

Now that you have convinced yourself and have secured a commitment to proper resources, now it's time to work with faculty members. Faculty also must see assessment as a way to improve the qualtity of education. Sending faculty to training along with including them in on developing the assessment process are ways of getting faculty buy-in.

2.1.4 GUARD YOUR FACULTY'S TIME

Continually look for ways to mininze the overhead of collecting assessment data. You want to create an environment where your faculty know and believe you are their best advocate for proctecting their precious time. There are many techniques such as in [Shay, et. al]. But developing this reputation as a protector of faculty time is almost as important as the actual techniques themselves.

2.1.5 SET YOUR ASSESSMENT GOAL IN STONE BUT THE PROCESS IN SAND

There are many assessment techniques and approaches. Remain flexible to faculty input and try to incoporate as many ideas as reasonably possible. The more you use or at least consider different ideas, the more your faculty will consider the assessment process theirs. If faculty members see the process as theirs, they will ensure that it succeeds.

2.1.6 MAKE ASSESSMENT RESULTS FORMATIVE, NEVER EVALUATIVE

Any hint that assessment results could be used for evaluative purposes will reduce the validatiy of your assessment data. The qualtity of your assessent data will hinge on the confidence that you faculty has that data collected is only formative.

2.2 THINGS TO AVOID

The items we discuss in the next section represent were developed from experiences in our department as we developed our assessment program. These *pratfalls*[1] provide the proverbial warning sign that something may be awry with your assessment program. See (Chewar et al, 2006) for a complete discussion of these pratfalls.

2.2.1 FEEDING A ZERO-DEFECTS MENTALITY

Senior leaders within a program might perceive an assessment effort only as a highly visible opportunity to showcase their program. Knowing that the fruit of their labor will be exposed to external critical review, they may only be interested in presenting their program in the best light possible. The focus will be on ensuring that the program appears to exemplify excellence from every angle.

To ensure that our assessment process would stay clear of the zero-defects mentality, we have emphasized several points of our broader philosophy when introducing the assessment process to our faculty. The program is not perfect, and should not appear perfect. We do not expect courses or our students to be perfect either. The ability of Course Directors to analyze performance indicator data and draw meaningful, actionable conclusions is usually valued by the Program Director more heavily than achieving consistently high performance ratings.

2.2.2 OVER-ASSESSING

Each performance indicator (PI) is important, and it is natural to feel like the more efforts toward it we can show, the better off we will be. This tendency of over-accessing can result in key nuggets becoming lost in a sea of irrelevant data and questioning the cost of our efforts (see 2.2.6). Others also warn against the dangers of over-assessment, such as (Shay, 2008).

To avoid this pratfall, our program scaffolds PIs and courses into groups that correspond to Bloom's cognitive domain categories (Bloom, 1984). Secondly, we use Course Monitoring Teams (CMTs) that are responsible for each group of PIs/courses. Prior to each semester, course directors make claims about which PIs should/will be measured during course execution and provide a tentative data collection plan for each claim. The CMTs screen these plans from courses in their group (about 1-2 each semester) and adjust to ensure the most efficient data collection.

2.2.3 RESTRICTING ACADEMIC FREEDOM

Some may view assessment as overly prescriptive. A highly respected faculty member with many years experience teaching a certain course may view the assessment process as a restriction of academic freedom, forcing programs and courses to teach specific topics using certain techniques. Shouldn't you be able to explore new concepts without jeopardizing your accreditation? Why should this professor be put under inspection?

In our program, we attempt to avoid this pratfall by adopting PIs contributed by input from all faculty, and then mapping the PIs to ABET/CSAB criteria for outcomes. We also allow the course director for each course offering to select the PIs they want to evaluate based on their coverage of the topic and pedagogy. Thus, we are measuring the knowledge, skills, and behaviors that we value. This enhances faculty buy-in as they are playing a major role in defining the assessment process.

2.2.4 PERCEIVING LOW RETURN ON INVESTMENT (ROI)

Regardless of whether or not an assessment program is useful at the program level, what does it really do for the average faculty member that is not involved in program administration? If we've successfully avoided pratfalls in

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[1] Roget's New Millennium Thesaurus (2006) notes that "a **pitfall** is an unforeseen or unexpected difficulty or disaster – or a trap in the form of a concealed hole; a **pratfall** is an embarrassing or humiliating mistake, blunder, or mishap.

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2.2.1 and 2.2.2, then ROI will have nothing to do with showing off or receiving buy-in for their accomplishments. So can we convince our faculty that their time spent assessing is worthwhile?

We see our assessment program as an opportunity for junior faculty to receive advice and for senior faculty to be mentors. Every member of the faculty wants to grow and to promote growth as instructors, so we push our assessment process as a framework developed to provide mentoring relationships. Also, assessment activities provide an opportunity to become familiar with other parts of the curriculum—perhaps even insights on future classes to teach—and collaborate with new faculty.

2.2.5 BREEDING INTELLECTUAL INCEST

Some folks see an assessment program as a process that makes us all teach mostly the same things, the same way. If we learn to communicate, compromise, and design complementary learning events, we may produce a better program on paper. However, will we be exposing our graduates to a wide variety of ideas that will prepare them for an ever-changing world? Will we be stamping out great new ideas in favor of the ones we are all more comfortable with? Will we even be capable of producing great new ideas?

We attempt to counter this pratfall by maintaining strong connections with our constituents, we taking our Advisory Board's recommendations seriously in our decisions for program change; and organizing tough external reviews for our capstone events (coupled with internal ones). These methods for countering Intellectual Incest are underscored by a departmental culture that values diversity.

2.2.6 NOT SEEING THE FOREST THROUGH THE TREES

Program leaders can become besieged by the information overload involved in collecting and analyzing data. They may be unable to sense the need for programmatic changes, since they are immersed in all the details of their assessment program.

In our program, we make a concerted effort to keep the Program Director removed from the CMT-level actions (except as an individual contributor). We place responsibility on the CMTs to sort out operational issues while the Program Director provides oversight. Finally, we devote two reports and at least one meeting each year exclusively to strategic analysis. For the purpose of this meeting, a CS Steering Committee is formed by the leaders of each CMT, the Program Director, and the Assessment Coordinator. Although each individual has a slice of operational experience within the assessment program, the Steering Committee focuses on analyzing outcomes that have (several) low-rated PIs to produce options for programmatic improvement.

3 PUTTING IT ALL TOGETHER

Now that faculty has the right mindset for assessment, it may be helpful to the reader to discuss our full assessment process. Like many programs, we have a set of objectives describe what our graduates can do 5 –7 years after graduations. These objectives are supported by our nine outcomes that indicate what our students can do prior to graduation. These outcomes align with ABET criteria for computer science programs.

We break down the outcomes into performance indicators which were 'bite-sized' goals that can be measured within a course. Normally, there are 2-6 performance indicators that support an outcome. To evaluate the achievement of PIs, we use four course monitoring teams (CMTs), each responsible for evaluating PI support by a group of courses. These teams are made up of a small group of faculty who are usually stakeholders for the courses that they evaluate.

The relationship between CMTs and course directors vary based on factors such as the experience level among members of the CMT and course director, and the topic being taught. For example, a CMT might have the course director perform the data collection and analysis his or herself. Then at the end of the semester, CMT would

decide whether to accept the course director's conclusions. Other the other hand, the CMT could take a more involved approach such as meeting regularly with the course director throughout the semester, providing continual guidance and feedback on the data collection and analysis. In our program, we allowed each CMT to decide how to determine its relationship with the course director. See (Huggins, 2007) for more details. We found that by having this flexibility, we were able to gain greater faculty buy-in.

After each academic year, the CS steering committee, which consists of the CMT team leads and the CS program director, meet to rate PI accomplishment and use this evaluation to provide documentation for outcome achievement. In addition, the CS steering committee uses this time to make recommendations for programmatic improvement, address PI shortcomings, and refocus the PI assessment and evaluation process for the upcoming year.

Recently, we developed the Tri-Level Model (Huggins, 2008) to illustrate the many parts to an assessment process. This model captures the various assessment dimensions and enables faculty members to quickly see how their individual efforts contribute to the overall process. Each level of the model is a cycle that defines, assesses and evaluates the goals at that level. The model also captures the interactions between levels. In particular we consider the assessment loop as a process of managing goals. The strategic goals (to the left, in blue) are program educational objectives, while operational goals refer to program outcomes. Finally, the tactical goals refer to course objectives.

Figure 1: The Tri-Level Model

There are multiple cycles in this model that capture the truly interactive nature of assessment. As you can see from Figure 1, there are linkages between the levels. For example, the arrow coming from the educational objectives circle to the program outcomes circle indicates that educational objectives drive program outcomes. There is a similar relationship between program outcomes and course objectives.

Also, within each level there is a cycle that represents a complete assessment loop that defines, assesses, evaluates and either validates or evolves the goals for that level. Figure 2 illustrates this internal loop with assessment products from a representative computer science program.

Note that for each level in Figure 2, the evaluation events provide an input for assessment data at the next higher level. For example, in the tactical (red) level which represents course objectives, the events include course summaries and the evaluation of PIs. These two events are used assessment data at the operational (green) level.
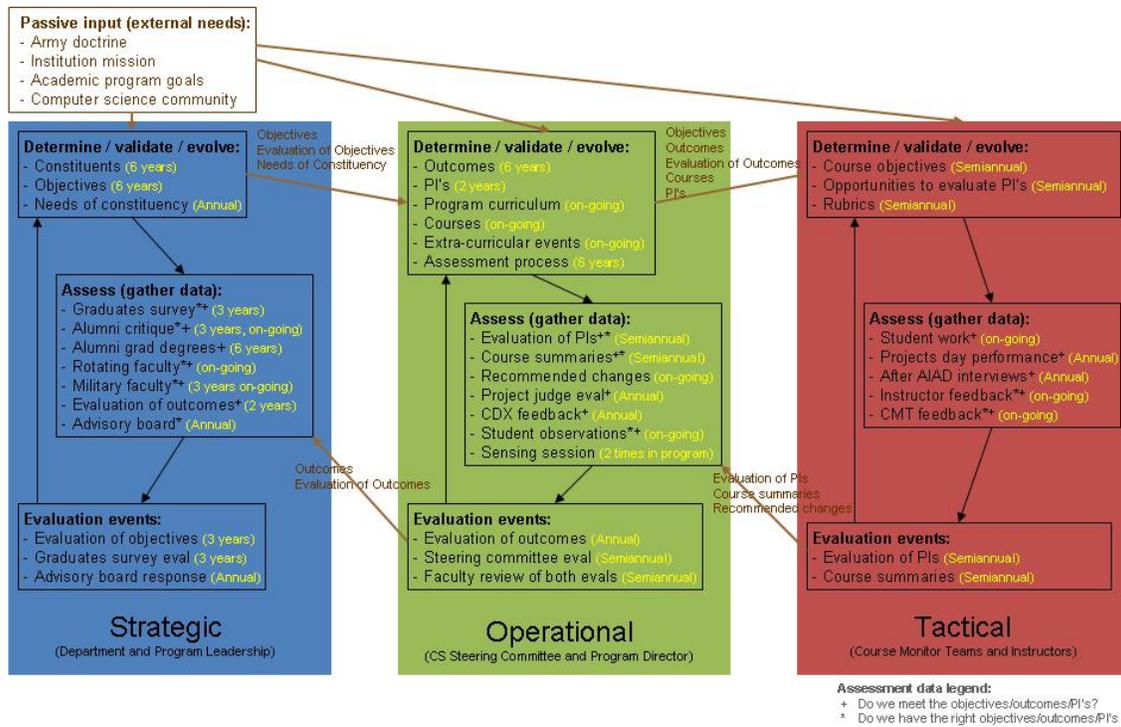

Figure 2: Assessment loop at each level

4 CONCLUSION

In the work, we have presented a series of steps that will help you set-up a successful assessment program. These steps focus on developing the correct attitude toward assessment. And with a healthy attitude in place, the next step toward ABET accreditation is much smaller.

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