

# **Surviving ABET assessment and still having time to grow your engineering program:**

## **Keeping the focus on the students**

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### ABSTRACT

Our recent ABET compliance review, the extensive training, and the transformation of our program has given us a number of ideas. We found that efforts focused on the frontend provided benefits in the form of reduced stress in the long-term (3–5 years). Next, worked with a subset of our constituency to establish few and simple-to-assess program educational objectives. Further, we staggered our assessment cycle in order to reduce assessment data collection, yet increase the usefulness in the evaluation process. We have eagerly incorporated the updated ABET view of multidisciplinary teams, which until recently was unknown to us.

### INTRODUCTION

The Geological Engineering program at The University of North Dakota has recently finished an ABET compliancy review. As a relatively small engineering program in numbers of both faculty and students, we would like to share our experience and lessons learned and posit their relevance to any size program. We found it best to have a well-thought-out scalable assessment plan that properly samples cohorts at a summative learning point without duplication. In practice, recently trained faculty were easier to convince of the need for a streamlined assessment plan and processes. Because we found that a single ABET-knowledgeable individual in the program will have a difficult time convincing colleagues of the importance of assessment, we suggest that at least two faculty trained in assessment are necessary for the program's continued growth. ABET accreditation is needed to attract new students, yet the work required to retain that accreditation can certainly seem overwhelming. The "death by assessment" mantra might begin to ring in one's ears. However, it does not have to completely consume your time. With proper training and a willing set of faculty, you *can* offer a growing, improving program, while providing students an enriched engineering education.

### HOW DID WE VIEW ASSESSMENT?

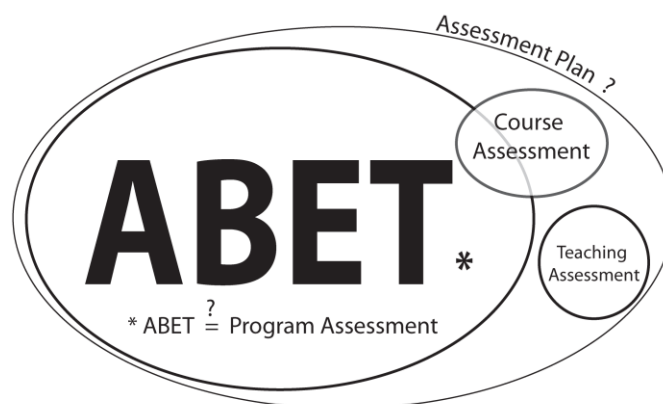
The satisfaction of ABET requirements were the program faculty's first thoughts when faced with assessment and planning. Our next challenge was to fully determine the ABET criteria and how to assess that criteria in our program.

The Venn diagram in Figure 1 is an attempt to characterize our idea about assessment as it pertains to ABET. ABET tends to be the brute in the room that is continually getting your

attention. That brute leaves little time to assemble a proper Assessment Plan for your department or program. Even the ongoing course and teaching assessment are compressed and compete for your time. Again the diagram points to important questions about your views on assessment. One might ask the following: Does my degree program really have an assessment plan or do we just pile paper during the 5<sup>th</sup> year of the ABET cycle?

We could continue to comment about how this view of assessment impacts one's career, research time, and tenure, but the focus of this discussion is on students. How does this view impact your students? Have students been provided with enough feedback to improve their skills and judgment? One might realize their course assessment seems a bit weak. Is that because only course grades have been used to assess the program? Are you taking an honest look at your degree program or do you equate your program assessment with everything ABET?

As we understand it, this is the unfortunate view typically taken by those who are tasked with administrating a department's program assessment. In our case, our Dean and Chair were supportive of the need for training and resources. We found that though we were trained, the remainder of the faculty were not necessarily appreciative of our efforts and continued to view assessment as a nuisance that must be tolerated until fed just enough so it goes away until the next cycle.

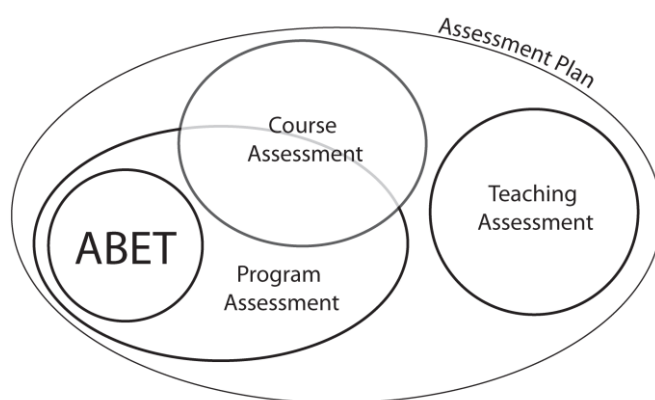


*Figure 1 – An illustration of a possible ill-conceived idea of assessment that is all too typical for engineering programs. ABET seems to dominate, if not make up the entire domain of the assessment plan. It may even dominate the view of assessment such that the only plan is to satisfy ABET.*

Two of our original misconceptions about ABET and its uses are shown in Figure 1. First, we presumed program assessment was entirely ABET. We were quick to discover that the assessment of our degree program can be robust, but ABET offers the framework that has become the standard. Any plan can be used for assessment, as long as you can map back to each of the ABET criteria. So why not just use the given criteria and focus on the students? Secondly, course assessment was thought to be an important component of program assessment process. Again, we quickly learned that an over reliance on individual student grades is not a proper form of program assessment and will lead to a shortcoming during your next ABET review.

## HOW CAN A PARADIGM CHANGE HELP IN ASSESSMENT?

In contrast, Figure 2 illustrates a change in our paradigm of engineering program assessment. It is a more balanced view of the components of an Assessment Plan that puts ABET in its proper place, which is entirely within the domain of program assessment. Essentially, ABET is no longer the brute. By starting with an assessment plan that enviably is laden with ABET terms and processes, the mental picture is one of a much smaller, diminutive, and less dominating part of the overall plan. Again, we have little doubt that the majority of program assessments will be dominated by ABET criteria and language, but we believe keeping the perspective like that in Figure 2 will lead to less stress and more opportunities to simplify assessment plans. It is possible with our posited simplified view that more of a department's faculty will become supportive, thus creating a culture of streamlined, targeted, assessment that satisfies many users of the data.



*Figure 2 – An illustration of a more balanced view of a department's assessment. ABET should be thought of nothing more than a component of the program assessment and course assessment as an extension of program assessment.*

Course assessment and ABET assessment requirements do not intersect in our paradigm. But this is not to say the student work used for the course grade is not the same used in assessing the program. It is important to realize that the same paper or test problem can be used in both! Simply use a different assessment tool on each. The goal of producing better students includes a well-balanced assessment plan. Not an *ad hoc* policy.

Note that we have increased the prominence of teaching assessment in our view of the ENTIRE assessment plan. This may be wishful thinking on our part but it is a necessary part of assessment. While it is important to streamline an assessment, the hasty use of a single assessment opportunity to collect data for several assessment reports may, in fact, be counterproductive. Many universities use student-based evaluation forms as an indirect assessment of teaching, as well as to assess class materials and perceived goals. This is an important point to make while including teaching assessments in assessment tools designed to be used with overall program assessment. We found that we were more likely to get faculty

participation in the assessment plan by decoupling the assessment tools involving teaching and program assessment. Key players are likely to have more buy-in while collecting the required data if they understand that the data will not, in some way, compromise their efforts.

Buy-in from the faculty is a must. It is important to develop a culture of assessment that is student focused. We recommend making a plan that fits the available resources of a department's program, and making it as integrated as possible with other ongoing assessments in the program (i.e., course assessment). Know specific modules in particular courses that offer a summative assessment opportunity and work with those instructors to have the student work evaluated for program assessment at the same time it is assessed for student performance in the course. This simplifies the program assessment immensely.

#### NEW IDEAS HAVE HELPED CHANGE THE CULTURE

With this new paradigm of assessment now providing a new perspective, we wish to provide a few ideas and processes that have helped us keep focused, while providing students with a fulfilling educational experience.

1. Set up a grid to delegate the assessment data collection. A transparent method of what is collected, WHEN and by WHOM, is critical to a successful program assessment. As new faculty come in they will already know the plan and have opportunities to ask questions prior to data collection. Also, the grid provides a method of accountability for all faculty in the assessment plan.
2. Incorporate assessment participation as a requirement for tenure and promotion.
3. Get into the habit of copious note-taking at meetings involving curriculum issues. Be sure to record the reasons why actions were taken and provide a short narrative background to the decision. Feel free to repeat the condensed record of the discussion each time the topic is revisited in subsequent meetings. The few extra paragraphs may seem redundant, but it helps to focus discussions during future meetings, reminds faculty of reasons why the decision was made (memories are short and faculty move on), and provides a fantastic resource when compiling evidence for ABET Criterion 4 (Continual Improvement).
4. Be sure to identify the faculty in the program! We were under the impression that faculty in the department were the faculty in the program. This is a very dangerous assumption. If you do not define your program faculty, the ABET Program Evaluator will do it when the team arrives at your campus and their assumptions may be to include or exclude faculty who have nothing to do with your program. We have 11 full-time faculty in a multi-disciplinary department and only 4 have been identified as the program faculty for the engineering degree program. We go a step further and identify the membership of the Geological Engineering Curriculum Committee (GECC) as the program faculty. In theory, any faculty member of the School or University can be a member of the GECC. In practice, it is a subset of the department faculty. This arrangement may be advantageous to other multi-disciplinary departments, which are becoming more common in these economic tough times. By limiting the program faculty to only those who wish to participate in the degree program, you have several benefits: 1) those individuals who make the effort to be part of the program faculty tend to have more buy-in to the success of the program, 2) for the purpose of satisfying Criterion 5 (faculty), the program needs only to provide information about those individuals in the program faculty and not the

entirety of the department, 3) smaller group dynamics tend to be more productive and focused, 4) similar to the last point, a focused group dealing with curricular issues can take on a more expanded role and manage the entire degree program. There is no minimum number of faculty specified by ABET.

5. Always remember that ABET is an assessment of the program, not of individual students or the department. Also, a student in the program should only be assessed once per performance criteria. If your assessment plan includes formative assessment opportunities, these should be listed separately from summative data when used for ABET evaluations.
6. “Multi-disciplinary” may not mean what you think. ABET does not have an official definition. However, there are guidelines that have come from Dr. Dayne Aldridge, Accreditation Director for Engineering (Aldridge and Lewis, 1997). Dr. Aldridge was asked for the ABET definition of multidisciplinary teams as used in Criterion 3. His response provides two definitions that may be used depending on a program’s needs. First, programs and an engineering school can work together to provide students with different specialized knowledge and skills to contribute to the team. So civil engineers and mechanical engineers can work together augmenting each other’s design experience. This approach requires extensive coordination between programs or departments. Second, a multidisciplinary team may be more appropriate to smaller-sized programs. This definition requires team members to assume the role of specialists during the design project. For example, a geological engineering design challenge may have individual members becoming the group *expert* for fundamental areas such as groundwater, rock mechanics, soil mechanics or environmental components of the design. ABET requires programs to document protocols to select roles for team members and to assure team members worked as *specialists* in the area chosen. It should be noted that programs using the specialist team member roles must be sure they distinguish the design challenge from a typical student work group experience. To be sure roles are followed and assessed, the selection of these roles should not be left to the students. Clear designation of the roles is needed so that students can make special or unique contributions to the teams’ purpose.

#### TRAINING IS CRITICAL TO A SUCCESSFUL ASSESSMENT PLAN

We recommend that a program have at least two faculty members who have had recent training in ABET assessment (Rogers, 2009). This is not to pay homage to the old saw “misery loves company” but does offer a distinct advantage to the success of assessment in your program. If one individual is trained and (unfortunately) becomes the *life* of the assessment, then that energy is gone when that particular person moves on or becomes disinterested in the process. A second person offers the first a sounding board and *confidant(e)*, of sorts, to help advance the program assessment to a department-wide effort.

Ideally, all program faculty should attend a training seminar about assessment. These can be with school, university, or national organizations. ABET offers many opportunities, from an intense one-day fly-in workshop to the 5-day Institute for the Development of Excellence in Assessment Leadership (IDEAL) workshop.

## SUMMARY

The intent of this paper is to encourage faculty to begin early in the accreditation cycle to evaluate their program and to begin collecting assessment data. From time to time, it is a good practice to step back and evaluate the success of a program, and satisfying ABET criteria is a requirement for a successful and healthy program.

## REFERENCES

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## BIOGRAPHICAL INFORMATION

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