A Systematic Approach to Pursue ABET Accreditation

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Abstract

The objective of this paper is to introduce the accreditation efforts and process of the Computer Engineering Technology (CET) program at Central Connecticut State University. The CET program set the goal of pursuing accreditation from the Engineering Technology Accreditation Commission (ETAC) of ABET a few years ago, however, the progress was not satisfactory until recent one and half years. Based on the lessons learned from previous years' experience, the faculty developed and implemented a systematic approach for preparing the accreditation. The approach worked very well and in one year, major accreditation tasks have been accomplished. The program finished and submitted its self-study report to ABET in June 2015, and the on-campus accreditation visit took place in December 2015. We expect to receive the final accreditation result in mid-2016.

This paper focuses on introducing our accreditation preparation approach and the major activities performed during this process. Lessons learned and future works are also discussed.

Introduction

ABET is a nationally and internationally known accreditation body. Students from an ABET accredited program are recognized of receiving quality education for professional employment and advanced studies. In addition to the benefits for students, getting and keeping accreditation is significant to the program as well since it can improve the program through continuous self-assessment and improvement cycles.

ABET has four accreditation commissions, namely Applied Science Accreditation Commission (ASAC), Computing Accreditation Commission (CAC), Engineering Accreditation Commission (EAC), and Engineering Technology Accreditation Commission (ETAC). Educational programs are organized under the commissions based on their disciplines. ABET publishes the General Accreditation Criteria that apply to all the programs under a commission. In addition, the programs under the same accreditation commission have program specific criteria, i.e. Program Criteria. A program seeking ABET accreditation must demonstrate that it satisfies all the General Criteria and all the Program Criteria implied by its program title [1]. One of the most important demonstrations is the program self-study report which addresses how the program has satisfied these criteria. ABET website provides the most useful accreditation documents, including a self-study report template, and they are

updated based on the annual review cycle. A program seeking accreditation must make sure that the most up-to-date documents are used.

Whether a program is qualified for accreditation and for how long depends on the level of satisfaction to the accreditation criteria and the shortcomings found from the self-study report and the ABET on-site visit [2]. Among the current eight General Criteria, Criterion 2 (Program Educational Objectives) and especially Criterion 3 (Student Outcomes) need to be assessed periodically to demonstrate the continuous program improvement defined by Criterion 4. The other criteria focus on the current program status in terms of students, faculty, resources and supports, etc. Therefore, accreditation activities related to Criterion 2, 3 and 4 are the major and most time-consuming tasks performed by the program.

The CET program at Central Connecticut State University set the goal of pursuing accreditation from ETAC/ABET a few years ago, and some preliminary tasks have been performed, such as course work collection for assessing the student outcomes. However, due to the lack of experience, the overall progress was unsuccessful. The faculty members agreed that although the program itself should satisfy the accreditation criteria, the assessment had not been systematically performed, nor had the actions of continuous improvement been documented based on assessment results over the years. Therefore, it is very important to set up a systematic approach in preparing for the initial accreditation and continuous improvement. We believe that many programs planning for the first-time ABET accreditation may face the same situation, and hope that our approach and experience will provide guidelines for those in need.

The following sections of this paper will introduce the related work, the approach adopted by the CET program to prepare the accreditation in terms of timeline and activities, the results and lesson learned, and lastly, the conclusion and future work.

Background

There are many helpful resources on ABET accreditation. The first and the most important one to utilize is the ABET website: http://www.abet.org. Introduction, accreditation criteria, self-study report template, assessment documents, videos, timelines, and workshop information can all be found there, and sometimes, overwhelming to those who are new to ABET accreditation. ABET also offers fundamental and advanced program assessment workshops which are "led by highly experienced professionals with wide-ranging experience in assessment and evaluation," per ABET website. It is very beneficial to attend the workshops because they provide face-to-face discussion opportunities on questions one may have from studying the website materials.

Another valuable resource is the previous publications on ABET accreditation, and many are in the ASEE annual conference proceedings. For first-time accreditation programs, [3] has summarized lessons learned from their first ABET accreditation experience in each the ABET criterion; [2] provides insight for preparing the self-study report from PEV's viewpoint thus resulting a self-study with desirable results. [4] describes the first-time accreditation experience of a two-year program. Most of the current accredited programs

either do not use management software to facilitate the process at all, or use a tool for a specific task only. For example, Yale University uses a web portal [5] for ABET accreditation, but there is no data analysis automation across different courses and different years. In [6], a web-based tool is used for course assessment result input. It also provides assessment result for a student in multiple courses.

This paper focuses on identifying important accreditation activities and how to efficiently organize and coordinate the activities in our accreditation process. It has been proved that the approach worked well for our first-time accreditation.

The accreditation approach

Per ABET, the program that is seeking for accreditation must submit a program self-study report months before the ABET visit. This gives the Program EValuators (PEVs) enough time to read about the program and the assessment that has been done. Therefore, self-study report is one of the most important and the first demonstration of the satisfaction to the accreditation criteria.

The accreditation activities aim to collect or generate the information to be incorporated in the self-study report. We think that the timeline to perform the various activities could affect how efficient the whole process is. Overall, we think that the self-study report should be written after the program has a good progress of important activities of Criterion 2, 3 and 4. Other activities, such as presenting the current curriculum, faculty, facilities, enrollment and graduate, focus on the most up-to-date information and they could be performed during the writing and submission of the self-study report.

The above lesson comes from our own experience. Our program initiated the accreditation activities years ago without any experience. The activities performed included collecting faculty resumes, course syllabus, curriculum, laboratories, and facilities information, etc. Self-study report was started to incorporate the information. The faculty members started collecting student work for all the courses every semester. However, assessment and continuous improvement actions were not systematically performed and documented. As a result, when the program determined to move the accreditation forward one and half years ago, the previous collected work could not be utilized as most of the information was not up-to-date anymore, especially, the curriculum and laboratories had been updated multiple times. We realized that it was the approach rather than the program itself that had delayed the accreditation. This lesson provided us with valuable insights and experience for the new accreditation process.

The new CET program accreditation process started in fall 2014 and the accreditation visit was scheduled in fall 2015. That means from September 2014 to June 2015, the majority of the related activities (except for continuous improvement actions) need to be accomplished and the self-study report must be submitted to ABET by July 1 2015. In summer 2014, a faculty member attended an ABET accreditation workshop on assessment. Given the time of two semesters (Fall 2014 and Spring 2015), faculty members identified major activities that must be done in each semester, and some spanned over multiple semesters. In fall 2015,

major activities were to prepare for the ABET on-campus visit and continuous improvement. The activities are summarized in Table 1.

Table 1. The CET Program Accreditation Activities
(L – Low; M – Medium; H – High; S – Short; Lo – Long)

Description	Complexity	Time	Who	When
Review/define Program Educational Objectives (PEOs)	L	S	All faculty	Fall 2014
Review/define Student Outcomes (SOs)	M	M	All faculty	
Map SOs to PEOs and ABET Student Outcome criteria	L	S	All faculty	
Define baseline performance indicators of each SO	H	Lo	All faculty	
Map curriculum to the SOs and performance indicators	M	M	All faculty	
Plan student work collection (Fall, Spring) to cover all SOs	L	M	All faculty	
Collect course enrollment number for last two terms the course was offered	M	M	Coordinator	Spring 2015
Collect course syllabus	L	S	Coordinator	
Collect faculty resume (ABET format)	L	M	Coordinator	
Request student transcripts for submission	L	S	Coordinator	
Perform and analyze IAB and alumni surveys	M	M	Coordinator, IAB, Alumni	
Update program website with up-to-date ABET required information	M	M	Coordinator	
Organize Department ABET accreditation meetings	M	M	Coordinator, faculty	Fall 2014 and Spring
Facilitate IAB meetings	M	M	Coordinator, faculty, IAB	
Develop assessment tools and templates	H	Lo	Coordinator	
Develop assessment rubrics	H	Lo	All faculty	
Perform senior student surveys	L	S	Coordinator, students	

Student work collection	H	Lo	All faculty	2015
SOs assessment based on collected student work and surveys	M	Lo	All faculty	
Develop action plan for continuous improvement on the assessed SOs	M	M	All faculty	
Write self-study report	H	Lo	Coordinator	
Attend ABET Summer Institutional Representative Meeting	L	S	Coordinator	Summer 2014 and Fall 2015
Organize Department ABET accreditation meetings	M	M	Coordinator, faculty	
Collect text books for display	L	S	Coordinator	
Compose assessment binders for all SOs	M	Lo	Coordinator, faculty	
Compose course binders for courses in curriculum	M	Lo	Coordinator, faculty	
Compose department meetings and IAB meetings binders	L	S	Coordinator	
Compose student transcript binder	L	S	Coordinators	
ABET Accreditation visit				Dec. 2015

In table 1, the activities are organized by semesters. The complexity associated with each activity is noted with Low (L), Medium (M), and High (H). The time used to accomplish the activity is noted with Short (S), Medium (M), and Long (Lo). The table also lists the parties that were mainly involved in accomplishing a specific activity. The complexity of an activity lies in keeping the consistency among the work between different faculty members, courses, assignments, and semesters etc., and the coordination among different parities (faculty, students, school offices, university offices, IAB, and alumni, etc.). Higher complexity normally means longer time to accomplish the task. However, some activities with low and medium complexity may still need a lot of time due to volume of the work.

Because it was the first-time ABET accreditation application, from Fall 2014 to Spring 2015, an effort was made to assess all the SOs. In the future, a six-year review and assessment cycle plan will be followed. In fact, ABET does not define how long the cycle should be but leave it as a choice of the program.

A faculty member was selected as the accreditation coordinator to lead the activities such as coordinating meetings, providing supports to other involved faculty members, coordinating

data collection and assessment, creating tools and templates to assure consistency among different courses and faculty members, and writing the self-study report. Table 1 lists the major activities performed but not all. It is very important and beneficial to study the ABET website for accreditation documents, tutorials, and the updated requirements. In addition, the CET program did not need a Readiness Review because the school already had other ABET accredited programs under the same accreditation commission.

The results and lessons learned

Accreditation results - The above approach is used by the CET program and the accreditation process was very successful. With all the listed activities accomplished, our self-study report presented ABET accreditation team with all the necessary information to understand the program, the first-year assessment results, and the continuous improvement plan to close the assessment cycle in the near future. The Program Audit report presented by the team identified the program with two "Concerns" but no "Weakness" or "Deficiencies".

The concerns are pertinent to Criterion 4. Continuous Improvement. The first concern recognizes that the program has completed the assessment on all the SOs and proposed suggested improvement by the faculty members. Documentation of the implementation of the improvement, however, is yet not available. This is legitimate as the program just finished collecting and assessing the SOs, and improvement using the resulted action plans will be documented in the following years. The second concern is on the level of attainment of an SO. In our Self-study report, the "level of attainment" is defined as follows:

Not Met		Met Score: 2.8 - 3.59	Exceeded Score: 3.6 - 4.0
Fail Score: 1.0 - 1.99	Minimum Attained Score: 2.0 - 2.79		

In our assessment, a SO assessment result that falls into category "Not Met" triggers a change in action. However, there is a sub-category "Minimum Attained" in the "Not Met" category which caused confusion because "minimum attained" could mean no action required. Therefore, the program faculty will redefine the "level of attainment" to make sure that this confusion is eliminated in the future. In addition, faculty member may suggest and take continuous improvement actions even though the current assessment results fall into the category "Met".

Although it was not a concern during our ABET accreditation, often questions on how "level of attainment" of a SO is assessed are raised. In our approach, a SO is assessed by several baseline performance indicators defined by the faculty members. Based on the performance indicators, the courses that focus on those topics are identified. Then faculty members who teach the courses collect student work related to the topics and assess the work using rubrics (developed by faculty) of the performance indicators. The level of attainment is embedded in the rubrics.

Lessons learned – Following are the lessons we learned through the process:

- Simple but clear – try not to confuse the accreditation team. This requires the presentation of self-study report and visiting materials to be well-organized and to the point. The PEVs will appreciate the time saved in trying to understand the program through the report and during the short visit.
- For programs with no prior accreditation experience, a fundamental assessment workshop is very beneficial. Try to avoid advanced and complex assessment and continuous improvement approach for new accreditation programs.
- Understand the time relationship between different activities and prioritize activities accordingly.
- For a program new to accreditation, it is more convincing to provide as much assessment as possible on the SOs and a continuous improvement plan even if no action has been taken. It is acceptable to assess only a few SOs a year (based on the assessment plan), however, the CET faculty members made efforts to collect and assess data for all the 11 SOs in one year. It shows active assessment activities and educates all the program faculty members in one year. Assessment plan can be adjusted later.
- A supportive Industry Advisory Board that is actively involved in program advancement and accreditation is very important. Documentation that shows IAB supports should be provided. ABET team also meet with IAB representatives.
- Accreditation process is a teamwork process. The coordinator plays an important role in keeping activities on track and moving forward. Tools and templates will reduce inconsistency and faculty load, thus promoting timely completion. Our accreditation coordinator prepared bins, labeled folders for different assignment types and courses, EXCEL templates, resume templates, assessment folders, etc., which greatly facilitated and motivated the faculty members in the process.
- Try to spread activities over time and not to overwhelm faculty members by asking everything by the end of a semester.

Conclusion and future work

In this paper, we presented a systematic approach used by the CET program for ABET accreditation preparation. Accreditation process is long and time-consuming. There isn't a set way of demonstrating how a program satisfies the accreditation criteria. The assessment plan, schedule and actions could vary with programs and resources allocated.

Our first accreditation process went through smoothly. However, it was also noticed that much extra load was added to the faculty, and more to the coordinator. For a faculty member, keeping track of the tasks to be done for different courses could become confusing and out-of-schedule. For the accreditation coordinator, trying to make sure that all the tasks can be accomplished in time by related faculty members is especially difficult. Currently, email

reminders, announcement in meetings, paper notes, and office visits are the main ways of keeping things on track. A single task may require rounds of digging through emails, going through accreditation boxes, check-marking on papers back and forth. This consumes a great deal of energy and motivation for both faculty members and the coordinator. We plan to investigate and develop new solutions that can manage the accreditation process more efficiently in the near future.

References

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