Assessment for Accreditation and Beyond

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Abstract

This paper details the story of one division's efforts to update program assessment based on ABET and NWCCU accreditation requirements. During a fall term, the college required all programs to submit and implement new assessment plans, with results analyzed and reported at the end of the spring term. This coincided with our application for ABET accreditation of two of our engineering technology associate degree programs. The paper outlines the steps taken along the way to accreditation, highlighting efforts to articulate a program assessment plan. College assessment forms are referenced and sample plans included.

Introduction

Applications for accreditation, along with accreditation visits, are stressful times for all colleges and universities. The previous NWCCU accreditation visit to the college yielded a recommendation that student learning outcomes be defined and consistently assessed for all programs of the college and that the assessments clearly inform the planning process of the college to drive improvement. At that time, the college adopted a framework for assessment that attempted to link programs to the college mission. Engineering technology faculty had listed specific student outcomes such as "construct, test and verify the operation of various digital circuits" and indicated that tests and laboratory reports would be used as measurement devices. Unfortunately, although these reports had been completed several years ago, there were no records of the assessments actually being conducted and no results available.

In preparation for the next NWCCU accreditation visit, the college developed a template to be used for assessment plans for all academic programs. This template can be found in Appendix 1. The engineering technology faculty struggled to use the template both for the college's assessment program and for ABET accreditation. Fortunately, the dean had attended an ABET Technology Education Initiative (TEI) workshop and was somewhat familiar with the Assessment Planning Flow Chart[1] created by Gloria Rogers to guide faculty through the process. It was that experience which guided the process for our division.

Fall Convocation – Setting the Stage

Faculty anxiety was high. Already overworked with teaching at least fifteen credits and three to five different preparations each semester, in addition to requisite meetings and committee work, faculty were not willing to grapple with the language of assessment. Program mission and goals had been identified but measurable student learning outcomes, assessment methods, and performance criteria were not yet part of their vocabulary.

The situation was further complicated by the fact that many faculty perceived the proposed assessment process as largely an exercise in paperwork because of prior experiences. They were unwilling to devote time to this effort because they did not believe that their efforts would lead to measurable outcomes.

To address these concerns, the fall division meeting was devoted to a discussion of change and assessment. A power point presentation highlighted the positive results that outcomes based assessment could bring to academic programs; stressing that, when used to full advantage, outcomes based assessment plans and reports will drive program review and help faculty to identify changes and improvements.

Program Director Workshop

The academic administrative structure of the college organizes faculty under program directors with each program director reporting to a department chair who then reports to a division dean. It was the program directors who would bear the primary responsibility for submitting an assessment plan. An Assessment Workshop was for all program directors in the division. Of course the only time that worked with everyone's schedule was Friday afternoon. Several balked at the idea of spending a Friday afternoon working on assessment forms but it was explained that, if we all worked together, we could share ideas and perhaps even enjoy our work. Additionally, the promise of pizza and soft drinks further encouraged attendance.

The workshop took place in one of our computer classrooms and, at the start of the workshop, each program director received
- Copies of the "old" assessment plan for his/her program
- Copies of the new college assessment forms
- Handout of the power point presentation
- Electronic copies of both old and new assessment forms

The power point presentation was brief and reviewed the college's assessment plan and defined many of the terms therein. Leadership and faculty roles were also clearly defined and timelines were shared. Following the presentation, program directors began working to revise the old assessment plans. The primary outcomes lacking in the old forms were several items from ABET criterion 2. In particular, the ability to:
- Function effectively on teams
- Communicate effectively
- Understand professional, ethical and social responsibilities[2]

Although most program directors were not directly involved with ABET accreditation, all recognized the need to incorporate interpersonal skills such as those listed in ABET criterion 2 as an important outcome for all academic programs. They discussed this and shared ideas. One program director devised the outcome "students will demonstrate positive work ethics and interpersonal skills in a group environment" (Appendix 4) and that phrasing was quickly adopted and incorporated into almost every program assessment plan.

As they developed methods to measure and assess outcomes, those were also shared and adapted to fit individual program requirements. For example, one of the assessment plans that includes the outcome "students will demonstrate positive work ethics and interpersonal skills in a group environment", now lists the following assessment methods:

- "Ethical practices are emphasized throughout the course of study and student actions (academic practices and honesty) are continuously observed and corrected during academic instruction
- Students assist in the completion of group projects and receive satisfactory participation grade from peers
- Students must display ethical and interpersonal skills during group presentations
- Results of individual group assignments and peer comments will be evaluated."

The experience of learning and working together yielded many dividends. It was energizing to observe the synergy. As the workshop ended, several participants expressed thanks for the experience. Further evidence of success is the fact that all program directors completed and submitted their assessment plans on time.

Implementation

After assessment plans were submitted, they were each reviewed by the Office of Institutional Research and returned with comments and suggestions for improvement. For example, one program was told that its program goals were general statements about knowledge and skills expected in graduates and it was suggested that they focus more on what the students will learn in the program. Some suggestions necessitated revisions to the plans and, by the time they were returned, it was early December and faculty members were more concerned with finals than with revising assessment plans. Program directors requested a second workshop in order to formulate their revisions.

Once again, the workshop took place on a Friday afternoon. There was again tremendous collaboration as program directors realized that the comments and suggestions could be categorized and that there were many similarities among the comments received. For example, the program goals that were criticized as being general statements were revised and now state "The students will learn the engineering technology methods and procedures used by technicians in the … industry. Students will become skilled applying practical knowledge using applicable test equipment in a state-of-the-art environment. Ethical practices are emphasized throughout the course of study and student actions (academic practices and honesty) are continuously observed."[3]

The second workshop was followed by individual conferences between the dean and each program director. During the conferences, program strengths and weaknesses were examined with regard to faculty, facilities, equipment, and curriculum. The conferences provided an opportunity to celebrate the program successes while planning for the future. Each assessment plan was discussed in detail. Several programs added additional student outcomes to ensure that graduates would be adequately prepared to communicate effectively and to understand ethical responsibility.

Results

Many of the assessment plans necessitated curricular changes. In particular, they required faculty to include more group projects as well as papers. While some faculty were resistant to such

change, one surprising result was that many of the students complained that they entered the program for the hands on training and technical skills and should not be required to do research, write papers, and present group projects. When faculty explained the need for these behaviors in the workplace, students became more accepting of the change.

An added benefit is that local companies, when presented with documentation of the efforts detailed herein, have been more willing to create and offer internships to our students. They have expressed increased satisfaction with the students' abilities to function as members of work teams. In several instances, interns have been offered full-time positions upon graduation.

Another result of the assessment process is demonstrated by the information management systems (IS) program. Previously, IS faculty had been unable to agree on a text and unable to agree on common outcomes. Efforts to institute an outcomes-based assessment program in this case resulted in a faculty effort, led by the department chair, to agree on an exit exam that would be administered to all students completing the course. Faculty members in the program agreed on all test items and the exam was administered at the end of each class during the spring term. The program director collected data from all faculty members showing the number of students who answered each item incorrectly and that data was analyzed to identify statistically significant differences among classes taught by different instructors. Results were shared with faculty and initial discussion centered on whether specific test items should be reworded or otherwise edited. The preliminary report indicated that 87% of students taking the exam scored above 70%, thus indicating that course outcomes are being achieved.

Perhaps most importantly, faculty members have followed the assessment plans, assessed learning outcomes, and documented both successes and failures. The college is learning from these assessments, and continuously improving academic programs. The ABET accreditation visit was positive, identifying strengths, weaknesses and concerns, but finding no deficiencies. The associate degrees applied for are now ABET accredited.

Recommendations

We learned much from the process and make the following recommendations to college faculty embarking on outcomes based assessment programs.
1. Conduct periodic faculty workshops on assessment techniques.
2. There should be a director of assessment to oversee the process and assist faculty. Our college hired an assessment director during the second year. The director has been an enormous help to faculty but the engineering technology program would have been positively impacted if the director had been in place when faculty applied for ABET accreditation.
3. Each department and or program should conduct an annual end of year review of assessment results. While scheduling may be difficult because faculty are traditionally not available after spring final grades have been submitted, some discussion could occur via email. Additionally, faculty can devote a portion of the fall convocation meeting time to discussion of assessment results. Items that do not require major changes could be implemented during the fall term. Those that require curricular changes could be

discussed throughout the fall term and/or throughout the academic year, and changes implemented when practical.

4. The assessment process requires a realistic time frame and goals. Whereas an assessment director may see a need to require assessment plans for the next academic year to be submitted in May, realistically, faculty need time to analyze spring final grades, discuss implications, and formulate plans to address any changes that are needed.

Conclusion

It was an enlightening process. Over the course of two years, we learned much about how to assess learning outcomes. Faculty have followed assessment plans and have documented both successes and failures. They are learning from these assessments and continuously improving academic programs. In the long run, students, faculty, the college, and the community will all benefit from the process.

ASSESSMENT PLAN

_____
(**(**Degree Program)

_____
(Degree Level)

_____
(Assessment Period Covered)

_____
(External Accreditation Agency, if applicable)

_____
(Assessment Coordinator)

_____
(Date Submitted)

Program Mission	Program Goals	Measurable Student Learning Outcomes	Assessment Methods	Assessment Implementation
The program mission is a holistic vision of the values and philosophy of the program. Each program mission will include a statement of how the program mission supports the institutional mission.	Program goals are general statements about knowledge, skills, abilities, attitudes and values expected in graduates of the program.	Measurable student learning outcomes for the program are clear, concise statements that describe how students can demonstrate their mastery of the program goals.	What methods will be used to assess student demonstrate student knowledge, skills, and abilities? Develop performance criteria for each outcome.	State when and where the assessment methods/instruments will be administered and data collected. Some assessment methods may be continuous throughout the program; portfolios, for example, and others may occur as an event at the end of a program; capstone courses, for example.

Appendix 2
ASSESSMENT REPORT

_____   _____
(Degree Program)   (Degree Level)

_____   _____
(Assessment Period Covered)   (External Accreditation Agency, if applicable)

_____   _____
(Assessment Coordinator)   (Date Submitted)

Measurable Student learning Outcomes	Results and Analysis	Dissemination	Improvement
Measurable student learning outcomes stated in the program assessment plan.	Who will analyze the results? What were the results? Did students meet the performance criteria for each outcome?	When, where and how will the results be reported to program, department, division stakeholders?	How will the results be used to improve the program? Who will be involved in the improvement plans?

Appendix 3

ASSESSMENT PLAN

<u>ELECTRONIC ENGINEERING TECHNOLOGY</u>
<u>TELECOMMUNICATIONS EMPHASIS</u>
(Degree Program)

<u>2005 -2006</u>
(Assessment Period Covered)

<u>Arthur G. Eggers, Program Director</u>
(Assessment Coordinator)

<u>ASSOCIATE OF APPLIED SCIENCE DEGREE</u>
(Degree Level)

<u>ACCREDITATION BOARD FOR ENGINEERING</u>
<u>AND TECHNOLOGY</u>
(External Accreditation Agency, If Applicable)

<u>December 2005</u>
(Date Submitted)

Program Mission	Program Goals	Measurable Student Learning Outcomes	Assessment Methods	Assessment Implementation
The Telecommunication Emphasis prepares students with the necessary skills required by today's high-tech, high-wage telecommunications industry. Instruction includes: • telecommunications • advanced telecommunications • electronics • digital circuits • data acquisition • microprocessor interface and programming • fiber optics. The program supports the CCSN mission to prepare students to obtain employment or to transfer to a four-year program of study.	The students will learn the engineering technology methods and procedures used by technicians in the telecommunications industry. Students will become skilled applying practical knowledge using applicable test equipment in a state-of-the-art environment. Ethical practices are emphasized throughout the course of study and student actions (academic practices and honesty) are continuously observed.	Construct, test, and verify the operation of voice and data cables, various AC, DC, analog and digital circuits, demonstrate a working knowledge of microprocessors, data acquisition devices, fiber optics, electronics/telecommunications laboratory test equipment and perform a mechanical and fusion splice to specification.	98% of students must satisfactorily complete the following core courses with a 70% or better: • ET131B • ET132B • ET212B • ET226B • ET228B • ET276B • ET287B • ET293B 98% of students must satisfactorily complete the program labs with a 70% or better. Students must display an understanding of the laboratory experiments by writing a report and presenting the information orally.	The Program Director will collect student laboratory sign-off sheets at the end of each semester for evaluation. The results of individual experiments will be evaluated by the individual instructor and Program Director to determine areas of difficulty and review for improved or improvised instruction. Final exams and lab experiment grade analysis will be performed by the individual instructor and Program Director. A sample of student work from each section of the course will be provided to the Program Director by faculty for statistical analysis.
		Perform local area network analysis and management.	98% of students must satisfactorily complete the following telecommunications courses with a 70% or better: • ET276B • ET293B 98% of students must satisfactorily complete the program labs with a 70% or better. Students must display an understanding of the laboratory experiments by writing a report and presenting the information orally.	The Program Director will collect student laboratory sign-off sheets at the end of each semester for evaluation. The results of individual experiments will be evaluated by the individual instructor and Program Director to determine areas of difficulty and review for improved or improvised instruction.

Appendix 4

Measurable Student Learning Outcomes	Assessment Methods	Assessment Implementation
Explain the signaling specifications of the telephone set, subscriber loop interface and central office and distinguish between the various modulation and multiplexing techniques commonly employed in the Public Switched Telephone Network (PSTN). Design and test low-pass, band-pass, and high-pass filter using operational amplifiers.	98% of students must satisfactorily pass the final exam with a 70% or better. 98% of students must satisfactorily complete the program labs with a 70% or better. Students must display an understanding of the laboratory experiments by writing a report and presenting the information orally.	Final exams and Active Filter lab experiment (reports) will be evaluated by the individual instructor and Program Director. A sample of student work from each section of the course will be provided by individual instructor and Program Director for statistical analysis. Results of the analysis will be evaluated by the individual instructor and Program Director to determine common areas of difficulty and reviewed to assist in development of improved instruction techniques and/or assessment tools.
Demonstrate positive work ethics and interpersonal skills in a group environment.		Results of the analysis will be evaluated by the individual instructor and Program Director to determine common areas of difficulty and reviewed to assist in development of improved instruction techniques and/or assessment tools.
Perform a minimum of basic calculus operations including differential and integral operators and apply them to solve electronics problems.	98% of students must satisfactorily complete Math211B with a 70% or better. Examinations will be evaluated by the individual instructor to determine accurate measurement of outcomes.	Results of the analysis will be evaluated by the individual instructor and Program Director to determine common areas of difficulty and reviewed to assist in development of improved instruction techniques and/or assessment tools.

Bibliography

1. Rogers, G. "Assessment Planning Flow Chart," 2004.

2. "Criteria for Accrediting Engineering Technology Programs", ABET Technology Accreditation Commission, November 29, 2004. Also available from http://www.abet.org.

3. Eggers, A., "Assessment Plan for Engineering Technology" available at http://www.csn.edu