

## **A Collaborative Assessment Tool for Technical Writing and Communication**

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### **Abstract**

To address ABET's Student Outcome in Criterion 3 stating students should graduate with "an ability to communicate effectively", Lipscomb University's Engineering program began requiring a technical writing course in 2010. To assess the course's effectiveness, the department in collaboration with English Department faculty teaching the course use the AAC&U's Written Communication rubric to measure student development. Having successfully passed an ABET general review, the process shows great promise. Results gathered over three academic years indicate a majority of students taking technical writing show an increase in written communication proficiency. The development, implementation, and effectiveness of the current assessment process from 2014 to the present are presented. Current efforts to evaluate and possibly modify both the process and the technical writing course to better align with the new ABET student outcome in Criterion 3 for graduates to have "an ability to communicate effectively with a range of audiences" will be explored.

### **Keywords**

collaboration, technical writing, communication

### **Introduction**

This paper will focus on Lipscomb University's Department of Mechanical Engineering multiyear, development of its technical writing course and corresponding assessment instrument for ABET student outcome G - "an ability to communicate effectively". This effort was, and continues to be, a collaborative effort between Engineering and English faculty. ABET has long put an emphasis on all forms of communication as an important attribute for engineering graduates. This emphasis has, at its root, the needs of the industries served by the engineering profession. Thus, effective communication has been a focus of the mechanical engineering program at Lipscomb University since its inception in 2002. During the first few years of the programs existence, development of communication skills was addressed in the general education curriculum through an Introduction to Communication course, taken by all university students in their first year, and through the mechanical engineering curriculum via laboratory reports in the junior year. The assessment of the lab reports was conducted by departmental faculty. However, the faculty desired a more formalized and structured way to develop the communication skills of engineering students and a better way to assess student learning and progression.

### **Background**

In Spring of 2009, the Mechanical Engineering faculty began an extensive discussion with English faculty to develop an alternative. These discussions were lengthy, collaborative, and constructive. A course in technical writing already existed in the junior-level English curriculum; the course was a more generalized writing course that could be taken by any student across the university but was usually populated with English majors on the writing track. With some small modifications, it could be redesigned to serve the needs of both student populations, and thereby, create a course where both student groups could learn in a collaborative environment. This was much preferred by both groups of faculty over a more traditional model of creating a special course offering for engineering majors only.

In Fall of 2009, the mechanical engineering faculty submitted a proposal to change the mechanical engineering curriculum to replace the campus wide General Education requirement of CO1003 - Intro to Communication with EN3143 - Technical Writing. This required discussions with both the Office of the Provost and the General Education Council because it would be a general education exception for engineering majors. After many detailed conversations with all involved parties, the change was accepted and in Fall of 2010, all new mechanical engineering majors were required to take Technical Writing.

The basic curriculum of the Technical Writing class changed very little to accommodate the engineering students although the course offerings doubled and then tripled over the next several semesters. The courses are capped at 15 students and regularly contain a mix of students across disciplines but mainly from English, Engineering, and Environmental Sustainability. The course focus on audience, purpose, and style remained the same and a unit on writing about data was given more emphasis. The area that did change significantly was an intentional focus on creating spaces for the different majors to work collaboratively on projects throughout the semester. Faculty from both departments firmly believe in the benefit of students learning

Now mechanical engineering students were getting technical communication content as part of their curriculum, but it would take a while longer to develop a better assessment method. From 2010 until 2014, satisfaction of ABET Student Outcome G would be measured using lab reports as it had been since the initial accreditation report for the department. The departmental faculty did not especially like this method because they felt they were ill suited to be the assessor of a skill or discipline outside their department, but they did not see a better way at the time.

It should be noted that this work, while done in collaboration between departments on campus, was done without researching other programs' assessment policies and processes. Additionally, because of the number of years that have passed since we began our assessment plan, we decided it would be misleading to conduct and include a search now which might imply that the results of that research had informed our own assessment process.

## **Development**

In its entire assessment program, the mechanical engineering department was utilizing a very complicated assessment program of multiple assessment instruments tied to specific course assignments and projects totaling approximately 49 separate measurements in courses both inside the department and from the general education curriculum. This complicated plan had been developed in 2004 to assess a program comprised of 30 students and three faculty. What

had worked in the beginning was becoming unmanageable with four faculty and 75 students. Specifically, the grading of multiple memorandum and formal reports in the junior labs had been manageable with the small initial student size, but quickly grew to the point of being impossible to give meaningful and constructive feedback to students in a reasonable amount of time as well as being ill suited for assessment purposes.

Over time, the entire assessment program began to break down. The backlog of unassessed material began to grow and the faculty knew an overhaul was inevitable. In fall of 2014, leading up to the 2015-2016 ABET accreditation cycle, the department decided to completely redesign its ABET assessment process. The faculty decided to significantly simplify the assessment process and start from a blank page to develop a new plan. This was a great opportunity to examine how all A-K outcomes were assessed and specifically address concerns with engineering faculty assessing writing and communication skills.

The Mechanical Engineering faculty wanted to seek help again from the Department of English faculty with whom they had successfully collaborated to create a technical writing course in 2009 and 2010. During conversations between the faculty in 2014, English faculty proposed using an existing rubric developed by AAC&U<sup>1</sup>. The VALUE rubrics, as they are called, were designed by teams of faculty experts from colleges and universities across the country to measure common student learning outcomes and are free for all AAC&U member institutions. The Written Communication rubric worked well with ABET's student outcome G and was adopted by the department for use in the updated ABET assessment program in Fall of 2014.

### **Implementation**

With a rubric in hand, all that was needed was the writing samples. After further discussions, the faculty decided to collect writing samples from every group of students before taking and after taking EN3143 - Technical Writing and score them using the AAC&U rubric. EN3143 - Technical Writing was placed in the fourth semester of the curriculum so samples were taken in the third and fifth semesters from mechanical engineering courses where the students were already submitting individual writing assignments. The student population was small enough that the total population could be assessed rather than just a sampling. The initial downsides to this approach were a multiyear cycle to collect pre and post samples from each student and the time involved by a Department of English faculty to assess using the rubric.

The first use of this new assessment was on student work collected from AY 2014-2015. Samples were collected from the mechanical engineering faculty and passed to the English faculty for assessment. The initial goal was set as 80% of students would show improvement from their pre to post technical writing sample as scored by the rubric. The results were returned to the department that 7 out of 8 (87.5%) students showed improvement, a fantastic result. At that time, the task of evaluation did not seem too much but both groups of faculty acknowledged that the situation needed to be monitored.

### **Effectiveness**

These results were returned in time to be included into the departmental self-study report and were submitted to ABET in Summer of 2015. The program evaluator raised no questions about

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the writing assessment instrument or its effectiveness in either his pre-visit questions. During the visit, no questions were asked about the assessment and no concerns, weaknesses, or deficiencies were found in any of the program assessment instruments or their implementation. In all post visit correspondence, there were no concerns, weaknesses or deficiencies identified with this or any assessments.

In the years since AY 2014-2015, the assessment has continued to be used by the mechanical engineering department. The overall performance of the assessment instrument is shown in Table 1. The initial goal of 80% improvement was set in 2014 and has not been changed, though it has been discussed in annual continuous improvement cycles. This assessment and its instrument are one of the best working and best designed in the entire assessment plan. Data from AY 2017-2018 and AY 2018-2019 suggest that some attention should be paid to both the goal and the students. This will happen as a natural part of the departmental continuous improvement plan required by ABET.

**Table 1: Assessment Performance by Year**

<b>Academic Year</b>	<b>Goal</b>	<b>Percentage</b>	<b>Number</b>
2014-2015	80%	87.5% improved	7/8 improved
2015-2016	80%	92.8% improved	13/14 improved
2016-2017	80%	100% improved	14/14 improved
2017-2018	80%	36.4% improved 81.8% same or higher	4/11 improved 9/11 same or higher
2018-2019	80%	69.5% improved 100% same or higher	16/23 improved 23/23 same or higher

Looking forward, there is one glaring issue with the assessment plan as it currently exists. While it was originally a fairly simple task for the faculty to score samples in a few hours, the growth in the mechanical engineering program enrollment has meant this method is also becoming onerous. While the faculty feel confident in the assessment results, it becomes difficult to ask another department to step in to do part of the assessment work when the number of mechanical engineering students has grown 23% between Fall 2014 and Fall 2018 with projections of up to 50% additional growth in the next 7 to 10 years. This challenge will be the primary concern for both Mechanical Engineering and English faculty in the current academic year.

### **Future**

As ABET transitions from student outcomes A-K to 1-7, both the Mechanical Engineering and English faculty believe that the current plan is still applicable. The addition of the phrase “with a range of audiences” between the old student outcome G and the new student outcome 3 actually helps to articulate what we already do in the course. Although the course is titled Technical

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Writing, students create documents and presentations for a range of communication situations and audiences. They write various reports, some with the professor as the audience, others with a more public audience of non-profit organizations. In addition, through the University's service-learning program, students use the skills they learn in the class to create both written and visual documents for non-profits in Nashville and make various oral presentations before both small and large groups of students, professors, business leaders, and other mentors they have reached out to during the semester.

While it is tempting to increase the scope of our assessment to include all of these types of communication, we believe if students are successful in transferring the skills they have acquired in the course to their lab reports, the AAC&U Written Communication rubric is broad enough to capture their growth (or lack thereof) in their general communication.

### References

- 1 Association of American Colleges & Universities, "Written Communication VALUE Rubric", <https://www.aacu.org/value/rubrics/written-communication>

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Dr. Green is an Associate Professor of English and Director of the Writing Program at Lipscomb University. She received her PhD in Rhetoric and Composition from the University of Louisville and has an MA in English from Murray State University and a BA in English and history from Bellarmine University. Dr. Green teaches courses in professional and technical writing and African American women's literature.