OUTCOMES ASSESSMENT FOR ENGINEERING TECHNOLOGY PROGRAMS

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Abstract – The emphasis here is on a discussion of different ways to assure good outcomes assessment for engineering technology programs. It is very important under the new ABET criteria, commonly known as TC2K, that Engineering Technology programs show that they are meeting the objectives and outcomes that are necessary for TAC of ABET accreditation. The key is to state your outcomes and then show that you are meeting them.

Index Terms – assessment tools, program educational objectives, program outcomes, accomplishments following graduation, achievements at graduation, TC2K, engineering technology

INTRODUCTION

We will look at five different institutions that have been working on outcomes assessment in engineering technology. The University of North Texas has found that student learning outcomes do not CQI make. The Community College of Southern Nevada provides an interactive tale of the journey taken by a department seeking ABET accreditation for its Engineering Technology and Telecommunications programs. California State University at Long beach describes their use of project portfolios in outcomes assessment for engineering and technology students. Student outcome assessment, a comprehensive collaborative assessment process between industry and the Department of Industrial Technology at the University of Nebraska at Kearney, is explored.

STUDENT LEARNING OUTCOMES DO NOT CQI MAKE

Assessment of student learning outcomes is applied to course objectives which, in turn, are applied to both ABET outcomes criteria and professional association outcomes criteria. These results are further applied to department goals and college goals. However, these results are from only one assessment method. Assessment results from senior projects evaluation and exit interviews are also applied to ABET outcomes criteria. Once in place, this process that utilizes these assessment methods is an indication how faculty assume they are succeeding. However, a comparison must still be made to affirm that constituency requirements are being achieved. Results from post-graduation surveys and employer satisfaction surveys are used as a comparative tool to indicate if the program is as good as believed. Results will be presented in graphical form of all listed items and procedures, including changes made based on assessment results and a timeline for various assessment methods. [1]

AN ASSESSMENT JOURNEY

The interactive tale of the journey taken by a community college department seeking ABET accreditation for its Engineering Technology and Telecommunications programs is discussed. This presentation details the process from beginning to end and includes activities that simulate each step of the process with time for discussion of the final question “Would your program merit accreditation?” During the fall 2005 term, the Community College of Southern Nevada required all programs to submit and implement new assessment plans, with results analyzed and reported during the Spring 2006 term. This coincided with the application for outside accreditation of two programs within the division. The discussion will begin with an outline of the

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steps taken along the way to accreditation, highlighting efforts to articulate a program assessment plan. Several assessment conferences were attended before attempting to articulate a plan for the program. New college assessment forms will be presented and sample plans provided prior to session participants working to write and/or critique plans. Time will be devoted to group discussion and the results of the effort and experience will be shared. [2]

USE OF PROJECT PORTFOLIOS IN OUTCOMES ASSESSMENT FOR ENGINEERING AND TECHNOLOGY STUDENTS

Assessing students' mastery of engineering and technology requires more than just examinations and traditional techniques. The use of project based approaches to engineering and technology education and preparation of the graduates in the "real world" will be examined. This approach is the result of extensive background and experience in both industry and academia, and is also based on ongoing discussions with industry associates. The methodology and practice for project based courses will be described, specifically the approaches for proposal preparation, reporting of progress, and final presentation by teams of both undergraduate and graduate students. This approach, as developed and used for the last ten years, requires the students to be aware of requirements, resources, constraints, risk mitigation, competition, and team work. It also prepares the student teams to present and evaluate the work critically for success of performing within budget, schedule, as well as presenting and defending their work for possible funding. Also described is the evaluation and assessment approaches and tools used in the course of these projects and presentations of results for both design and implementation. [3]

STUDENT OUTCOME ASSESSMENT: A COMPREHENSIVE COLLABORATIVE ASSESSMENT PROCESS BETWEEN INDUSTRY AND THE DEPARTMENT OF INDUSTRIAL TECHNOLOGY AT THE UNIVERSITY OF NEBRASKA AT KEARNEY

The Industrial Technology Department assesses its program effectiveness through a comprehensive assessment process directly tied to student outcome statements. Quantitative and qualitative data collected from each assessment instrument is evaluated by department faculty, industry representatives and program advisory committees to determine changes that may be required in the curriculum. Five assessments are utilized.

Final Evaluation of Intern by Work Site Supervisor: The intern's supervisor documents work performance and evaluates training plan objectives set at the beginning of the internship.

Comprehensive Exam: Given to all graduating seniors to determine the technical and non-technical knowledge level mastered by the student.

Employer Survey: Employers provide information about graduates initial hire position, current position, increased responsibility, work performance, productivity, business techniques, personal characteristics and the employer's satisfaction with the graduate.

Graduate Survey: Sent to all graduates one and five years after graduation. This survey determines the success and advancement of graduates in the workplace.

Student Confidence Scale: Correlating directly to student outcome statements and administered prior to graduation, it provides an understanding of how confident students feel about being prepared to successfully enter the workplace in terms of their knowledge, skills and abilities.

To assure a continuous cycle of curriculum improvement faculty and advisory committees meet to assess the data. Advisory committees play an integral role in assessing data and making recommendations to faculty for curriculum improvement. Changes to the assessment methods, instruments and curriculum are made as appropriate. [4]
AN ASSESSMENT AND CONTINUOUS IMPROVEMENT MODEL FOR ENGINEERING TECHNOLOGY PROGRAMS

Assessment and continuous improvement is an essential and critical process for higher education. Development and Implementation of such a process is not only required by ABET, but it is also a necessary condition for the maturation and development of any engineering technology program. With the development of multi-dimensional educational programs offered through a variety of delivery methods, the presence of a systematic method for improvement in today’s world is critical. The assessment and continuous improvement plan discussed here was developed at Old Dominion University (ODU) and implemented during the last accreditation cycle within the Engineering Technology Department. The plan is based on two cycles of assessment and evaluation, short cycle of one year and a long term cycle of three years. The process devised comes up with an objective attainment index and an outcome attainment index which are used as metrics for assessing progress. The plan includes a variety of assessment methods and tools. In addition to assessing the achievement of program outcomes, the plan allows assessment of program objectives and goals. A method for individual course assessment is also presented. Issues related to institutionalization of the assessment process are also discussed. [5]

REFERENCES


