

Industry Visits as an Assessment Tool

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Abstract

Under the new ABET criteria for judging the effectiveness of engineering and technology programs, the success of program graduates serves as an additional and necessary measure of program quality. This paper describes a structured, industry site visit program employed by each of the departments of the College of Engineering and Computer Science at California State University, Sacramento. The visits typically consist of plant tours and meetings with alumni and their supervisors. The alumni are asked to review their experiences since graduation, make general comments on the relevance of their education in their careers to date, and answer specific questions about their engineering education. These visits allow us to learn from our graduates what they are doing with their education, what was most valuable to them, and specific ways to improve the educational process. Additional, and unexpected, benefits of these outcomes assessment meetings are that the alumni tend to get more involved and active with the university, frequently offering significant financial and other support, and faculty report gaining renewed enthusiasm for their teaching.

Introduction

ABET has recently revised the accreditation criteria for judging the effectiveness of engineering programs. Under the old criteria, ABET assessed engineering programs based mainly on curriculum, faculty, and facilities. Under the new criteria, an outcomes assessment requirement is part of the ABET review of all engineering programs. The employment success of program graduates is now a crucial measure of program quality for ABET accredited programs.

ABET has not issued specific instructions on exactly how the outcomes of programs should be assessed, perhaps wishing to encourage creativity in the process. The criteria state that “each program must have an assessment process with documented results... The assessment process must demonstrate that the outcomes ... are being measured. Evidence that may be used includes, but is not limited to, the following: student portfolios, including design projects; nationally-normed subject content examinations; alumni surveys that document professional accomplishments and career development activities; employer surveys; and placement data of graduates.”¹

The College of Engineering and Computer Science at California State University, Sacramento, has initiated a new method for assessing the outcomes of our graduates, in response to the new ABET requirements. This paper describes our industry site visit survey program.

Overview of the Program

Over the last two years, the engineering and computer science programs at CSU, Sacramento have been making site visits to nearby industries, each department visiting one to two companies each semester. We will continue the process for 3 years, leading up to the next ABET review, meeting with alumni and managers of our alumni to gather information to assess the outcomes of our graduates.

The industry site visit program model includes guidelines for the selection of companies to visit; the identification of graduates and key personnel to interview; the determination of questions to be asked; the selection of faculty to be sent on visits to specific industrial sectors; for analyzing and reporting findings; and for using data collected in effecting program changes.

Arranging the Visit

Companies are selected based on their history of employing CSUS graduates, and the proximity of the company to the campus. Typically, an alum is contacted by the Director of Career Services to propose a meeting with a group of alumni employed with the company, to discuss their post graduation experiences. We also request meetings with managers and supervisors of the individuals to obtain their perceptions of CSUS graduates. Scheduling arrangements are then made for the visit.

Teams of faculty from each of the departments (Civil Engineering, Electrical & Electronic Engineering, Mechanical Engineering, and Computer Science) are selected by the department chairs on the basis of the faculty members' background and interest in the company and its products or services. There is some variability in the way that meetings are structured by the various departments. For example, Civil Engineering has conducted a meeting on campus with alumni from a variety of different California Department of Transportation offices. Mechanical Engineering visits are usually made to manufacturing facilities where site tours can be included.

Visit Content

The visits for most departments consist of company tours and meetings with alumni and their supervisors. The alumni are asked to review their experiences since graduation, make general comments on the relevance of their education in their careers to date, and to identify new trends that may affect our curriculum. Gathering information on areas in which the department's program needs updating or improvement is a primary objective.

The following are the questions asked of the alumni:

- What CSUS learning experiences have been most valuable to you in your career?
- What knowledge and skills that you acquired during your education have you used most?
- What knowledge do you use the least?

- What do you wish you had learned in school but did not?
- In your opinion, what are the emerging and expanding fields in your industry?
- In your opinion, what critical skills and knowledge will students studying (CE, CS, CPE, ME, MET, EEE) need for the future?

Additional follow-up questions are also asked.

Managers are asked to give an overview of the company's operation and how our graduates fit into the organization. They are asked to describe the strengths and weaknesses of CSUS graduates. Managers are also asked how CSUS graduates compare to graduates from other universities.

Discussions are tape recorded and notes are taken by individual faculty members present at the outcome assessment visits.

Visit Follow-up

Reports are generated for use by the departments in the assessment process. These reports contain summaries of the alumni reviews of their experiences since graduation, as well as their answers to the questions asked by the faculty.

For example, the report on the visit with ME and MET alumni at Hewlett-Packard's manufacturing facility in Roseville, CA, shows the following answers to the question, "What are the emerging and expanding fields in your industry?"

Information Technology, including subcontracting to IT companies
 Composite and non-metallic materials
 Process engineering
 Environmental engineering, including reclaiming materials
 Electronics cooling

The report on the visit with ME alumni at the Fairfield, CA plant of Annheuser-Busch shows the following response to the question, "What are the strengths and weaknesses of our graduates?"

Strengths: Broad, practical knowledge and understanding
 Weaknesses: Knowledge and experience with electrical control systems

The visit reports are distributed to the faculty of the department and discussed at department meetings. Specific course and program modifications suggested by the report are processed according to normal departmental procedures.

Conclusions

The outcomes assessment visits allow us to learn from our graduates what they are doing with their education, what was most valuable to them, and what specific steps can be taken to improve the educational process.

In addition to the information generated from the questions asked in the visits, faculty have an opportunity to see exactly what our graduates are doing in a variety of settings, and to identify what programmatic elements worked and what did not. Faculty also are able to develop closer relationships with alumni and the companies that employ them. Faculty and alumni exchange business cards and contact information for future communications on a multitude of issues. Faculty report gaining renewed enthusiasm for their teaching as a result of participating in these visits.

As a result of participating in these outcomes assessment meetings, alumni tend to become involved and active with the university. Alumni are genuinely flattered to be asked their opinion. They are delighted to be speaking to the faculty who educated them. Alumni often express interest in supporting the programs in any way that they possibly can. During the course of the visits, the alumni frequently offer support by providing equipment, software, information about corporate grants, and tours for faculty and students to work sites or manufacturing facilities.

Bibliography

1. URL: <http://www.abet.org/eac/engineer.htm>; Accreditation Board for Engineering and Technology, Inc., "Engineering Criteria 2000"

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