Linking Industry & Academia:
Effective Usage of Industrial Advisory Boards

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Abstract

With the advent of ABET Engineering Criteria 2000 and beyond, the emphasis of the evaluation of engineering and engineering technology programs has shifted from the strict examination of curriculum content, to measuring outcomes based assessment. As these programs are required to create and demonstrate a process for the evaluation of curriculum objectives, industry can serve as a valuable partner in this process.

This paper will provide an overview of development and implementation of industrial advisory boards at two institutions. This efforts were undertaken to aid in satisfying several ABET accreditation requirements. The specific activities and functions of the industrial advisory board will be discussed, as well as the challenges faced during implementation.

Introduction

With the advent of ABET Engineering Criteria 2000 and beyond, the emphasis of the evaluation of engineering and engineering technology programs has shifted from the strict examination of curriculum content, to measuring outcomes based assessment. As these programs are required to create and demonstrate a process for the evaluation of curriculum objectives, industry can serve as a valuable partner in this process.

As a requirement for EC 2000 a program must present evaluators with evidence that indicates their graduates are achieving professional growth and development. Programs must also show that students are effectively advised and monitored throughout their academic careers. Industry can work hand in hand with programs to demonstrate these criteria. As employers, industry can advise programs regarding the strengths and professional development of active students and graduates.

Through the development of industrial advisory boards, many programs are able to monitor the effectiveness of their curriculum and performance of past graduates. Industrial advisory boards can not only provide evidence of outcomes based assessment, but they can also provide a "real world" assessment of a program's curriculum and coursework.

Often colleges and university's fail to utilize the potential of their industrial advisors, and at many institutions they are absent all together. By rekindling old relationships or forging new ones, programs will be better served, and better prepared for evaluation with industry

cooperation. As the ABET EC2000 criteria is implemented, industry can serve as a valuable resource to programs in demonstrating the requirements for ABET EC 2000 and beyond. By developing strong links to industry, colleges and university's can serve to strengthen their programs and ready themselves for evaluation and assessment process.

Discussion

Industrial advisory boards can serve many functions to the college or university. The traditional role of these boards is to act as a contact point for a college or program to keep in touch with the trends and needs of industry. In our quickly changing world of high technology, this role is still a valuable one, but there are many other functions that this board may now serve. At the New England Institute of Technology and the University of Hartford, we are expanding the role of these boards to help us meet the assessment requirements for accreditation. By expanding the activities of our industrial advisory boards, we have forged stronger relationships with our local and regional employers, as well as expanding their interest in our programs.

The industrial advisory boards of these two institutions is drawn from a pool of industry professionals that represent companies who actively hire our graduates or graduates of similar experience. The size and makeup of the pool varies, but we have found that a group of twenty to twenty-five individuals will produce a diverse and active population. We seek membership from those that represent not only the industries our graduates will enter, but also those representing the various job functions our graduates may fill in the future. This results in a population of technicians, engineering technologists, engineers, engineering managers, and corporate executives. In our experience, the board is constantly changing; some members serve consistently for many years, while other choose to serve for a shorter tenure. We do not currently ask for any mandatory length of service or commitment, and the members appreciate this flexibility as their job requirements and commitments often change.

Our industrial advisory board meets formally two times per year, and they may be asked to evaluate or respond to other issues outside of the formal meetings. The purpose of these meetings is twofold. The first is to allow the group to meet in a roundtable format to actively discuss pending issues and brainstorm on a variety topics. The second is to allow the faculty to network with this group, and to report any changes within the college or program, and how these changes may relate to past or current discussions. Our meetings have taken place in several different formats. These ranged from large discussions involving the entire group focused on multiple issues, to smaller groups chaired by a single faculty member focused on a specific issue or topic. We have experimented with these different formats to not only provide some variety, but also to make it easier for all members to interact. Attendance can be a challenge at times, but we have found that with a twenty to twenty-five member pool, we can expect at least twelve to fifteen members present at any particular meeting. We publish both an agenda and minutes for each meeting so that those who have been unable to attend are kept apprised of ongoing issues.

We call upon the membership to examine a variety of issues and topics at our meetings. We consistently query them regarding the content and breadth of our curriculum. This is often done with faculty members presenting an informational outline of our various courses. Detailed within these outlines are course content, skills assessed and presented, assessment methodologies

employed, laboratory projects and requirements, as well as discussion of math, computer, and communication requirements integrated into our courses. Our advisors are asked to comment on the relevance of the material, the desirability of certain skills, as well as suggesting future directions or any deficiencies they may note. This process has allowed us to have many very meaningful exchanges regarding not only the specific content of our curriculum, but the importance of certain skill sets for our students to function within industry. A secondary outcome has been that advisors have presented novel approaches or spawned new teaching methodologies allowing the faculty to more clearly demonstrate a particular concept or skill. Advisors are constantly providing the faculty with real world examples of how a particular skill or concept is put into practice.

Another function of our advisory board is to access the quality and skill set of our current and potential graduates. We ask them to annually complete two types of surveys. The first deals with the ongoing requirements of their industry, and what it demands of it's workforce regarding both skills and knowledge. The second questionnaire deals with the performance of graduates that they have employed. An example of these surveys and is shown below.

New England Institute of Technology   Electronics Engineering Technology
Supervisor Questionnaire

Your Name:_____Title:_____

Company:_____Department:_____

Address:_____Phone:_____

City_____State:_____Zip _____ _____

Position/Title of Employee:_____

Duties and Responsibilities:_____

_____

1.   Please rate the Electronics Engineering Technology graduate's academic preparation as related to present job function.
        _____Excellent   _____Good   _____Adequate
        _____Poor

2.   What is your opinion on how well the academic background prepared the Electronics Engineering Technology graduate for future growth in your company?
        _____Excellent   _____Good   _____Adequate
        _____Poor

3.   How would you rate the Electronics Engineering Technology graduate's overall ability to meet the needs of the business?
        _____Excellent   _____Good   _____Adequate
        _____Poor

4.   What amount of on-the-job training was required for the Electronics Engineering Technology graduate to be able to contribute to your company?
        _____None   _____Minimal   _____Moderate
        _____Considerable

5.   How much more additional training do you feel an NEIT Electronics Engineering Technology graduate requires than a typical person hired into a similar position?

_____None   _____Minimal   _____Moderate
_____Considerable

6.   Please list areas in which the Electronics Engineering Technology graduate my have been unprepared: ___

_____

_____

7.   What would you like to see added to the Electronics Engineering Technology program? _____

_____

_____

8.   How many NEIT graduates have you hired?_____

9.   Would you hire other NEIT graduates?_____yes   _____no

Comments (Please use reverse side for additional comments): _____

_____

_____

_____

In an effort to improve the response rate of the surveys, we are now experimenting with providing an electronic means to complete the surveys via the World Wide Web. The survey was designed to be as comprehensive as possible, without being too time consuming. These surveys and questionnaires often serve as the beginnings of more detailed discussions, rather than just a small piece of information. Results of the surveys are discussed at the meetings, and this often results in valuable discussions concerning the variety of skills that our employers desire. Our graduates are also sent a similar survey, and are asked to provide comparable feedback. The graduate survey is repeated every few years to track changes and trends that may be present.

Many challenges have faced us while trying to implement and expand the function of our advisory boards. The first was recruiting members. By using data from our students, graduates, as well as our cooperative education, internship, and placement departments, we were able to identify a group of companies that seemed likely candidates for our efforts. We tried to select as wide a variety of industries as possible in order to reflect the diversity of our graduates job opportunities. The contacts above often provided us with enough detailed information to identify specific individuals within a particular company. We have also tapped into our alumni as a source for membership on the advisory board, but we are careful as to not over represent this constituency. Once a pool has been formed, and members decide to "retire their membership" we often ask them to recommend another contact at their company for possible service.

Attendance is another challenge that we face. We try to schedule meetings at times that our membership is available, and this is often in the early evening. We entice them to attend by conducting the meetings in a variety of formats that address new and developing issues. The meetings are often anchored around dinner, and open discussions often take place before and

after the formal agenda. We also ask that if a particular member cannot attend a meeting, that they might send a replacement. This allows us to expand our membership pool, as well as receiving a diverse viewpoint from a particular company.

Conclusion

As ABET focuses its efforts on outcome based assessment, industrial advisory boards can be used to help colleges and universities to satisfy these goals. At the New England Institute of Technology and The University of Hartford, we have focused our efforts on expanding the role of our industrial advisory boards to help us demonstrate these objectives. Although we are in the early stages of developing our boards, we have begun to see our advisors taking a more interested and committed role because of our efforts. Although every effort has not been met with unbridled success, we feel that we have been able to keep our curriculum updated to the needs of our graduates and employers, as well as meeting the new accreditation objectives of ABET EC 2000 and beyond. We have found that as engineering and engineering technology programs are required create and demonstrate a process for the evaluation of curriculum objectives, industry can serve as a valuable partner in this process.

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