AC 2008-802: IMPROVING CURRICULUM WITH THIRD PARTY STANDARDS AND INDUSTRIAL ADVISORY BOARDS

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Improving Curriculum with Third Party Standards and Industrial Advisory Boards

Abstract

It is important, often critical, for educators to align their course objectives and course content with what is required by the businesses and industries which hire their graduates. Not preparing students to meet critical job-related demands will ultimately lead to poor job placement and poor job performance. More importantly, the fact that the university is not producing its best product penalizes all future students and negatively affects the institution’s reputation. In order for educators to prepare their students to become marketable, they will need to fully understand and assess the industrial and technological environment where the students are sent for employment. One of the approaches taken by the Organizational Leadership and Supervision (OLS) Program in the School of Technology to achieve the needed alignment is to ally with professionals in business and industry and to develop and refine our curriculum and learning objectives as a team effort. As noted in the Accreditation Board for Engineering and Technology (ABET) criteria for 2007-2008 for accrediting engineering technology (ET) programs (and OLS is a partner to the technology programs), the orientation of the technical specialization must be shown to be integrated into the curriculum through business and industry guidance. Curriculum guidance from knowledgeable third parties outside the university is extremely helpful and necessary. Thus, recommendations from professional organizations and business leaders are used to hone the curriculum for both graduate and undergraduate students. In this paper, the authors will discuss the steps taken to recruit advisory board members, the tasks performed by each member, the need for continuous improvement to keep the program current, and the problems of maintaining a viable advisory board. The essential components of maintaining an effective advisory board program in today’s fast changing society will be presented.

Introduction

Purdue University Calumet (PUC) is a regional campus of State University and is located in the northwest part of the state in Hammond, Indiana, a highly urban and industrial area of the state. The campus serves about 9,300 students and is primarily a commuter campus. The student population consists of about half traditional students and about half non-traditional returning students. The OLS Program is part of the School of Technology on the campus.

The OLS faculty at PUC have planned for future accreditation of the program and job success of its graduates by carefully blending technical courses and “soft skill” courses together. These courses also serve as useful accompaniments in the curriculums of the various specialty areas of the engineering technologies. However, this curriculum was not arbitrarily and unilaterally developed; it was developed through a series of well-planned advisory committee meetings over many years.
The program has benefited in its overall guidance from Technology Accreditation Criteria (TAC/ABET) Criterion 2, which lists the eleven areas of expertise a graduate must possess upon program completion; most people know these as the “a-k” criterion.

Under this standard, an engineering technology program must demonstrate that graduates have:

a. an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines,
b. an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology,
c. an ability to conduct, analyze and interpret experiments and apply experimental results to improve processes,
d. an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,
e. an ability to function effectively on teams,
f. an ability to identify, analyze and solve technical problems,
g. an ability to communicate effectively,
h. a recognition of the need for, and an ability to engage in lifelong learning,
i. an ability to understand professional, ethical and social responsibilities,
j. a respect for diversity and a knowledge of contemporary professional, societal and global issues, and
k. a commitment to quality, timeliness, and continuous improvement.

It is interesting to note that only four of the eleven criteria apply to technical areas. All others cover “soft skills” (i.e., communication, teamwork, and appreciation for diversity), which are the main focus of the OLS program. And by improving the courses offered by the OLS program with advisory committee guidance, the OLS courses which are used by the various technology specialties also benefit, since many of these OLS courses are used for soft skills training by the ET programs. What has been learned over the years from advisory groups is that employers prefer to hire technical graduates that also have the “people” skills offered by the OLS program.

Today, we live in a world that is constantly changing, not only in an informational sense but also as a society. It is not enough to create a static base curriculum in such an environment. Educators are required to update course objectives and materials depending on the needs and demands set by the industry and society. For example, who would have thought it was necessary just a short time ago to include on each syllabus the instructions for dealing with dangerous individuals on campus? Obviously, course objectives have to be parallel with the changing skills and/or knowledge required by industry or prospective employers, so these objectives tend to be moving targets. Prospective employers can be viewed as institutional customers, since they are hiring our graduates. Therefore, it would be fair to say that institutions are not fulfilling their purpose if those graduates are not being hired or recognized by employers/customers as worthy of employment. Moreover, institutions are not fulfilling their purpose if those graduates are not prepared or valued by prospective employers/customers. It is essential for an educational institution to identify and understand what the industry or the customer wants in a university graduate. This paper presents some necessary considerations for improving curriculum systematically with the utilization of third-party industrial advisory boards.
Discussion

An advisory committee representing the organizations which employ graduates must be utilized to advise the program in establishing, achieving, and assessing its goals. The committee must also, in every educational program, utilize some set of standards to judge its curriculum. In our case, OLS utilized a well-accepted standard throughout all schools of technology: ABET. ABET is a recognized accrediting body for college and university programs in technology (also in science, computing and engineering).

According to ABET, its accreditation is assurance that a college or university program meets the quality standards which are established by the profession for which it prepares its students. ABET accredits programs only, not degrees, departments or institutions. ABET accreditation, for example, focuses on program educational objectives which are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve: these are then linked to program outcomes, which describe the units of knowledge or skill which students are expected to acquire from the program to prepare them to achieve the program education objectives. Criterion 7 of the standards on Institutional and External Support provides for “Program Advisement”, and states:

periodically review program curricula, and provide advisement on current and future needs of the technical fields in which graduates are employed.

Method of curriculum review

It is essential that the faculty of each program recognize that making its course objectives parallel to those demands set by prospective employers is a critical step in the process. Initially, a needs assessment must be conducted to determine any gap between “what is” and “what needs to be.” In other words, where do our graduates stand or how are our graduates perceived by the employers, as measured against the employers’ desired abilities in its hires? With these questions as guidelines, the OLS Program attempts to staff its advisory board with members who are industrial professionals from various fields. The model which has yielded the best results for updating the curriculum is patterned after the need to analyze the entire program using the ABET process (even though those standards do not actually currently apply to the OLS Program in terms of accreditation). Thus, preparing students to meet these important standards requires a proactive approach to carefully select industrial and business leaders as members of our advisory committee. By working together with these individuals on a regular basis, institutions can not only identify program deficiencies but also enhance students’ chances for success in the workplace.

Although several steps are discussed in this presentation, each institution could modify these steps based its own needs. Chart 1 shows the pictorial view of the steps taken by OLS.

1. Identify appropriate Advisory Board members. (Around 8-10)
2. Establish a systematic approach to review program. (At least once per year)
3. Identify essential components of the program.
4. Layout program benchmarks
5. Identify objectives within each benchmark
6. Utilize consensus to determine modifications

Chart 1

Advisory Board Flow Chart

START

Identify Possible Advisory Board Members

Interested? Has background?

YES

Invite and Form the Advisory Board

NO

Not Invite

Review Program

Identification of Essential Components

Layout Program Benchmarks

YES

Determine Modification

NO

Sources of Advisory Board Members and Retention Issues

It is sometimes advisable to divide the larger advisory group into several smaller groups which can address specific educational objectives (e.g., human resources, training, labor relations, and safety). Once the overall objectives of a program are identified, the more specific details can be examined by experts in the field. However, the first and most important requirement is to find those experts and get them interested in helping your program succeed. One of the best sources of advisors is alumni of the program, both new and old graduates. Since alumni have gone through the institutional program and know it fairly well, and have worked in business or industry, they are best able to provide feedback as to what skills and/or knowledge should be needed or emphasized for future graduates. Of course, this input is supplemented by graduating senior surveys of what is good and what needs improving in the present program. It is also advantageous to include non-alumni members in the advisory board whenever possible. One of the main reasons for inclusion of non-alumni members is to bring in new ideas from disciplines outside your immediate area.
The OLS program has recruited members for its advisory board from the local chapters of professional organizations. It frequently uses the local chapters of the Society for Human Resource Management (SHRM), since many of our graduates work in the HR area, and it has also used the American Society of Safety Engineers (ASSE) since a component of OLS deals with Safety and Emergency Management. These societies serve the purpose of providing a convenient source of knowledgeable advisors but, more importantly, these members of professional organizations are usually highly motivated individuals who are current and interested in the field, and bring enthusiasm as well as knowledge to the process.

It is also possible to use a state statistics website to find larger employers in the area of the university to use as sources of advisory board members. The local industries are aware of the importance of helping to improve the educational process that supplies them with qualified and capable employees. Thus, upper management will frequently encourage its managers to become involved in the process of advising programs that supply their workforce. One final source of advisors that OLS uses is the qualified adjunct faculty (also known as limited term lecturers) who apply for part-time teaching positions. These individuals are well educated and highly motivated not only to teach but also to share their work experience. Thus, one advertisement for part-time faculty will produce both instructors and advisory board members.

From the authors’ experience, finding advisory board members has been easier than keeping them or keeping them active in the process. Often members as well as potential members find themselves overcommitted and unable to participate fully or attend the scheduled meetings. Their intentions are good but the demands of their jobs become an obstacle to meeting outside commitments. Therefore, every meeting must be carefully planned in advance and scheduled at strategic times, dates, and places. Of course, it depends on the composition of the board, but long meetings scheduled on Fridays or Mondays seems to have the worst attendance. As a result, the meetings must be kept short and to the point, not to mention scheduling the meeting at a time most convenient for the greatest number. Of course, the only way to determine that fact is to survey the committee on its preference for breakfast, lunch, or dinner meetings and the best days, times, and months to meet. In addition, the details of the meeting and an agenda must be consistently supplied to the attendees well in advance of the meeting. A yearly save-the-date announcement with frequent reminders is very helpful in getting full attendance and participation. More importantly, the details that need discussing must be of an urgent and significant nature to warrant the committee members’ time away from work. If the advisors get the impression that they act as just a rubber stamp on foregone conclusions, they will not return.

An advisory committee must know in advance that it will meet at least once (and preferably twice) during an academic year to evaluate a given program. It is essential to have a systematic review with your advisory board on a predetermined time schedule in order to get good participation. If everyone on the committee knows in advance that the meetings will be in September and April each year, there are fewer scheduling problems. This is especially true if the scheduling can be further defined as the second week of those months at noon to 2 p.m. on Tuesday.

Systematic review
In addition, understanding the sequence of things helps with the participation. In order to benefit the board members, and to make the advisory board guidance helpful for the program, the OLS program uses a standard agenda to ensure that every advisory board meeting covers the required areas which need industry input. The agenda can be customized for various needs, but the use of a consistent agenda from meeting to meeting ensures a consistent approach. An example of this agenda follows as Appendix I.

Another technique of systematic review which has proved successful for updating the curriculum has been to ask our advisors to evaluate the OLS Program based on well-established professional standards. Our advisory board evaluated curriculum suggestions against the well-defined standards of the SHRM recommendations for undergraduate curriculum\(^7\) and the core knowledge areas for the Professional in Human Resources (PHR) exam\(^8\). We asked our advisory board to review these areas, and we placed our courses in a knowledge matrix based on those standards. (A sample of this matrix appears below). We then asked our board for additional suggestions, based on their needs in new hires and the demands of the professional positions our graduates are hired into. This process has been performed several times over the years and it always yields important and significant changes in the curriculum. To be respectful of board members’ time, the authors do suggest that program review be done at a separate meeting from individual course review. Also, if you have numerous courses to review at one time, it is recommended that they be broken down into several parts and review each course in a sequence to avoid overwhelming the board in a single meeting. Too much review work in a single meeting can have the effect of diluting the amount of review time the board can spend with each course or component.

Professionals who evaluate the existing program against a professionally developed model or set of updated criteria generate the resulting curriculum which meets the requirements of the participating organizations that hire OLS graduates and professional standards for knowledge. This is continuous improvement at its best and it serves to keep the curriculum updated in accordance with the needs of business and industry. Thus, it provides benefits for all stakeholders from the institutions to the students to the employers.

### Sample Matrix for Curriculum Analysis

<table>
<thead>
<tr>
<th>Core Knowledge Area</th>
<th>Course</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs assessment and analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third party contract management, including development of RFPs</td>
<td></td>
<td></td>
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<tr>
<td>Communication strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult learning process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation concepts and applications</td>
<td></td>
<td></td>
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<tr>
<td>Training methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership concepts and applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project management concepts and applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversity concepts and applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR concepts and applications (interpersonal and organizational behavior)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR ethics and professional standards</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
One recommendation coming from our advisory committees as well as from other programs is the need for graduates to have written communication and presentation skills. This has been incorporated into the curriculum with increased written assignments and presentations in existing courses. The skill of written communication is an integral part of not only traditional classes but also online classes, and this change was brought about primarily by the advisory committees giving it so much emphasis. Another recurring theme of advisory committees has been the need for graduates to work in teams, and this concept has also been incorporated in the form of increased team exercises in existing courses. Even with the problems of accomplishing these objectives with commuting students, advisory committees feel that successful students who they will hire should have these skills.

Identifying Program Benchmarks and Goals

Every program must conduct its own self-examination of everything that gives the program its identity. It is absolutely essential for the program to perform a needs analysis that identifies program benchmarks and goals. In the process of determining where the program is currently, there must be an assessment of the program and the abilities of its graduates to perform their jobs upon graduation. The goals can be determined by the use of input from the advisory committee on desired capabilities of their hires from the program, and also from the third party or professional standards, as discussed above. Also, alumni are extremely helpful with reviewing goals when they have been in the job market for a while. These graduates are excellent sources of appropriate benchmarks. The mechanism which seems to work best in overcoming low response rates in surveys is to make it an easily returnable email survey with just a few essential questions. Since alumni are familiar with the program overall, and are working in the field, they can be an instant source of “gap analysis” for the program, and help with identifying goals for improvement.

Consensus Decision-making

It is the authors’ experience that no advisory committee wants to spend time making suggestions, only to have those suggestions ignored. The OLS program strives for consensus decision-making, in which the group discusses the issues until there is general agreement with the result. This does sometimes lengthen the time needed for the discussion and a final decision, but it has led to well-thought out and thoroughly discussed decisions that keep the advisory committee members coming back. As an example, the need for a minimum grade in courses was a hotly debated topic, but not because a minimum grade was considered a bad thing. The discussion
centered around the application of this concept: was it to be applied in major courses, prerequisite courses, or all courses in the degree? The advisory committee, as a whole, came to the decision that it should apply to only those courses in the major and that decision is the one that went forward as a program initiative.

Conclusion

Collaborating with industry would not only create a quality program which would benefit both industry and academic institution, but it also prepares students to be marketable in the future. In order to achieve this, OLS program at University has set the following criteria: identify appropriate advisory board members; establish a systematic approach to review program; identify essential components of the program with professional standards; lay out program benchmarks; identify objectives within each benchmark; and use consensus to determine modifications. Incorporating these suggested techniques to find and retain qualified advisory committee members can yield benefits for almost any program.

References

1. ABET web site, www.abet.org, access date 01-08-08
2. A policy many campuses have now adopted in light of recent events.
3. See, for example, the Criteria for Accrediting Engineering Technology Standards effective for the 2007-2008 Accreditation Cycle
6. such as http://www.stats.indiana.edu/
8. See for example http://www.hrci.org/Certification/BOK/NBOK/

Appendix I.
Standard Advisory Board Meeting Agenda for [program name]

1. Introduction/Welcome with updates and current developments in program
2. Facilities and planning--needs
3. Course content
4. Program Structure and Curriculum (program review can fall in this section)
5. Student learning outcomes and employment readiness
6. Board Member ideas and concerns about the program
7. Old business
8. New business

9. Adjournment