

Delivering a Manufacturing Engineering Technology Program to the Boeing Company

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Abstract

In the fall of 1997, the Boeing Company approached the Oregon Institute of Technology about delivering an upper division BSET in Manufacturing Engineering Technology to three of their work sites in Seattle. It was stipulated that the program should be accredited by ABET as soon as possible. This paper will detail the challenges faced by the Oregon Institute of Technology (OIT) in delivering this out-of-state program during its first academic year, and how these challenges were addressed as a guide to other institutions who might be interested in a similar endeavor.

Introduction

The challenges faced by OIT were formidable. In bringing the program to Boeing, it was understood that the program was to be eventually accredited by ABET. It was therefore necessary for OIT faculty to teach a substantial part of the courses. This meant that a program director with Basic Credentials¹ must be found. For the convenience of the students, it was also necessary that the courses be delivered in three-hour a day blocks at three Boeing locations. Since many Boeing students had substantial manufacturing experience, it was stipulated that test outs and/or portfolio verification for courses would be designed. Another task was finding qualified area adjuncts and locating equipment at local community colleges that could be used. For ABET accreditation it was also necessary that the program be the same as at other OIT campuses including equivalent library access.

Initial Plan

To plan the program, a steering committee was formed with three Boeing employees (the chair was selected from this group), three OIT faculty, and a student. The mission of this committee was to approve the methods and means of delivery of the program and to make sure that the quality of the program met ABET standards. Logistic requirements included substantial use of long distance education using appropriate software, long weekend classes, and main campus resident faculty moving to Seattle for a term. A movable laboratory was also to be investigated.

Although it was originally planned to start the program in the fall of 1998, it was decided to offer a portfolio methods course in the summer of 1998 for students that were eager to start the program as soon as possible. This was a good initial course since it showed the students what would be necessary to get credit for prior experience and proprietary learning. For portfolio courses to be acceptable by ABET, it was pointed out to these students that the portfolio method required a rigorous verification that prior knowledge was substantially equivalent to material

outlined in the syllabus of a course that the student wanted to get credit for. From OIT's point of view, it was also necessary that the portfolio policy and procedure be under the control of the faculty and that the faculty involved would be trained in the portfolio process. Due to the rigorous verification necessary, it was pointed out to the students that the portfolio method is quite time consuming and labor intensive.² For this reason, OIT expects many students to not elect the portfolio method once they realize the work involved. This was also one of the reasons for having a one-credit hour portfolio methods course as the first course for the initial Boeing cohort.

Memorandum of Understanding

A Memorandum of Understanding³ was signed by Oregon Institute of Technology and The Boeing Company that included objectives of the program, degree requirements, curriculum, evaluation, Boeing student issues, pace of the students through the program, size of the program, costs, drop policy, Boeing-supplied support, OIT-supplied support, and management of the program. An important consideration was protecting the students in the program, so they were assured of getting their degree, and still protecting both Boeing's and OIT's financial interests. Boeing is a very enlightened company when it comes to their employees' education. However, the aerospace industry is very cyclic. On OIT's side, administering the program involves committing a full time faculty member to Seattle for an indefinite period. It was decided to sign a commitment for at least two years by both parties and then working with students to let them complete the program once they had reached senior status.

First Academic Quarter

The fall academic quarter got underway with three courses in the major and one humanities course being offered. Fifty-five Boeing students took one or more of these courses. Of the courses in the major, one course was taught at three Boeing sites - Everett, Renton, and Auburn – by our former president, who was on sabbatical with Boeing. This course was taught on different evenings during the week for a three-hour block at each site. This course got many favorable comments from the students due to the depth of our president's knowledge. Another course was taught using this same time format by an adjunct faculty member, recently with an area college that had an ABET accredited mechanical engineering technology program. The chair of our manufacturing and mechanical engineering technology department taught the third course in the major. To make this feasible, our chair went up to Seattle for two weekends during the quarter and taught the course in five-hour blocks on Saturday and Sunday. He then spent the rest of the weekend advising students. This worked out very well and our chair got many favorable comments from the students, both due to the format, and due to our chair's depth of experience. The humanities course was taught over the Internet using web-based delivery. One problem encountered with this course was use of a chat room. Due to Boeing's e-mail firewall, many of the Boeing students had problems participating.

Lessons Learned

Many valuable lessons were learned from our experience with the first academic quarter. One of the most critical problems noted was in the area of academic advising. The prior academic

background of the students varied from no college credits at all to a baccalaureate in engineering. Work experience also varied widely, although not as much as academic background. Because of these variances, we found that academic advising was critical. Our chair therefore had one on one sessions with all the students in the cohort to find what credit they had and what courses they were eligible for. This will allow us to work out individual plans of study and prepare curriculum maps for the future.

One important lesson learned was the imperative of having a full time site coordinator. Although we had a Boeing staff person on site coordinating the program, and had our manufacturing department chair visiting Seattle to advise students and make plans with the local community colleges, we found that this would not be satisfactory for the long term. In fact, we had advertised for a full time on site coordinator, but had not found a satisfactory fit. It proved difficult to find an individual who could be a faculty member, run the operation in Seattle, and have a good feel for the OIT culture.

Future Plans

As mentioned above, the most critical problem to solve in the program is to have a full time site coordinator. The duties of this coordinator include advising students, teaching a nine-credit hour per quarter load, working with community colleges in the area to arrange for labs and courses there outside the major, obtaining and supervising adjuncts, and interfacing with Boeing including supervising the registration of students. It is now planned, as of this writing, for our former president to become site coordinator when he finishes his sabbatical at Boeing at the end of the winter quarter, and to have our chair move to Seattle during the summer and take over site coordinator duties then. During the winter quarter our chair will interface with the assistant director of our Portland campus to manage activities in Seattle. Goals we plan to accomplish during the winter quarter are: developing a students-courses matrix for Everett, Renton, and Auburn; obtaining comprehensive information about general education course offering at the community colleges near these three locations; having the program director personally contact the students with a complete recommendation about his or her schedule for the next term; developing an improved mechanism for enrollment in courses; and keeping in touch with our list of potential students in order to maximize the number of students in the program. This will allow us to offer a more flexible schedule.

Conclusion

For the program to have long term success, we have concluded that we must incorporate a concept called “active advising.” The curriculum map in the OIT Catalog⁴ is a very helpful source for students at the Klamath Falls campus. However, it is impossible to have one curriculum map for all Boeing students. It is not be an exaggeration to say that we need individual curriculum maps tailored for each student. It may look like a very difficult assignment to develop multiple individual curriculum maps. However, based on appropriate software programs, this task can be accomplished by a qualified person in a reasonable time. What is needed is a spreadsheet comprising a matrix of students’ names and all program courses, indicating which courses are completed by the students. This students-courses matrix will provide the needed information about the student body as a whole and about an individual

student. This information will be used for optimum course scheduling and for advising the students. This is what “active advising” means. OIT should not wait until the student comes to the advisor with a question. OIT should provide the student in advance by the recommendation of what classes he or she should take during the next term and during the academic year. We should provide the students by the information of which class he or she will take from our program (by term, by year) and which classes he or she should take from an appropriate community college. In other words, if we will have the students-courses matrix, we will be able to achieve the optimum course scheduling and the active student advising. In this way, we believe we can keep students in the program and have a mutually successful outcome.

Bibliography

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