
AC 2012-5322: CHANGING FROM ENROLLMENT-CHALLENGED TO RESOURCE-CHALLENGED: RESULTS OF A FIVE-YEAR ENROLLMENT STRATEGY

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Changing from Enrollment-Challenged to Resource-Challenged: Results of a Five Year Enrollment Strategy

Abstract

Many engineering technology programs across the country have been experiencing declining enrollments for the past decade. Although there are periodic increases at individual institutions, typically these are due to temporary external programs such as educational retraining for unemployed/displaced workers. These increases are generally short-lived and decreased enrollments continue. Our school, a small 4-year liberal arts institution with engineering and engineering technology programs, has shown a similar trend with the more dramatic decreases in the associate degree engineering technology programs. Faced with concerns for the viability of our technology programs and a clear understanding that our current methods of recruitment were not meeting our needs, we developed a multifaceted enrollment strategy. Our approach included programmatic review, alignment of advertising to student trends, and new sources of recruitment.

This work will detail our enrollment strategy and the concomitant results over a five year time frame that led to an enrollment increase in our engineering technology program such that it is currently the largest program at our institution. This rapid increase has changed our focus from program viability to a resource challenged environment (classroom space and faculty) where we are now pressed to enact more stringent enrollment controls.

Introduction

Student recruitment, retention, and their timely advancement to graduation are a constant concern of most engineering and engineering technology programs. This is borne out in their prominence in the literature and the attention it receives at workshops and conferences.^{1,2} Our engineering technology programs, having significant fluctuation of enrollment over its history, are no exception.

Penn State Altoona, one of nineteen branch campuses in the Pennsylvania State University system, acts as a liberal arts school with an engineering department. Penn State Altoona has both associate and baccalaureate programs in engineering technology and the first two years of twelve engineering majors. The technology programs include electrical (EET), mechanical (MET), and electro-mechanical (EMET). Students in the engineering programs take their first two years at Penn State Altoona studying general engineering topics and then transfer to Penn State University Park campus to finish their degree. While the engineering programs (~200 students/year) enrollment does change from year-to-year, the percentage change is not large enough to create either concern or difficulties in terms of resources such as classrooms, laboratories, and teaching staff. The technology program, however, with its smaller enrollment (~34-40 students/year) is affected by small changes.

Although we are addressing all three area affecting student enrollments, our primary focus is in recruitment. Year-to-year fluctuations of students entering our technology programs have had the largest effect on the health of the programs and they test the resilience of our resources.

Another element of this effort was to help students' awareness of the differences between engineering and engineering technology. Most first-year engineering students' understanding is limited to the notion that there are engineers and technicians. Few have knowledge of what lies in between—technologist. This understanding would allow them to make a more informed decision about their career choice.

Our efforts address both of these issues to create a win-win solution for both the students and the program viability.

Recruitment and Enrollment History 1999 to 2005

The start date (1999) for this discussion on recruitment and enrollments represents the graduation of the first class of the EMET program—it began in 1996. Also, during this period, Penn State Altoona offered two associate degree programs (EET and MET). The EMET 4-year program was a 2+2 where student first completed an associate degree in either EET or MET before applying to the EMET program to complete the last 2 years. The end date of 2005 represents a point of significant change in our technology programing and recruitment efforts.

Prior to 2003, the data in Table 1 shows engineering technology enrollment to be relatively constant. It remained above a critical number, below which, the health of the program was in question, see Table 1. In 2003, this positive trend changed. Technology enrollments, particularly in the associate degree programs, experienced a steady decline. In fact, this decline most likely began a year earlier. The government responding to the downturn in our economy began in 2002 to provide financial aid to displaced workers to reeducate/retrain. Many of our students that enrolled that year were associated with that program. In 2005, our first year enrollment dropped to an unhealthy level of 20 students.

Table 1 First year enrollments from 1999 to 2005 for the engineering technology programs at Penn State Altoona

Year	First Year Enrollment in Engineering Technology Programs
4 years avg. prior to 1999	53
Fall 1999/ Spring 2000	61
Fall 2000/ Spring 2001	57
Fall 2001/ Spring 2002	70
Fall 2003/ Spring 2004	34
Fall 2004/ Spring 2005	28
Fall 2005/ Spring 2006	20

Marketing of the engineering technology programs during this period was ad hoc at best. Arguably, the best recruiting method was word of mouth from current students and alumni. As admissions dropped, the engineering faculty would engage in various forms of recruitment efforts. Faculty driven efforts included typical venues such as visiting local high schools on career fairs days and meeting with high school guidance counselors. In addition, faculty were involved in the more institutional venues such as on-campus open houses. The later efforts were semi-annual college wide events and, therefore, they did not focus on our specific issues. Further, they were already doing what they could to attract students.

Penn State University (system wide) in an effort to be fair creates an additional and significant barrier to recruitment. Admissions policy allows advertising to be specific to majors but requires them to be general to the Penn State system. Thus, we are restricted in our ability to encourage students to attend Penn State Altoona by promoting the resources unique to our campus.

Beyond the limited efforts by the admissions office, the responsibility to maintain healthy enrollment levels falls squarely on the engineering faculty. Given limited faculty resources—particularly time—and their lack of training in the area, the limited results of their ad hoc efforts are not surprising.

In the years leading up to 2006, several faculty expressed a need to become strategic in developing and maintaining a recruitment strategy.

Recruitment and Enrollment History 2006 to 2011

In 2005, with only 20 students enrolling in the first year technology programs, the engineering department recognized the need to respond to this challenge as opposed to its history of reacting to it. A small group of faculty were given the task. The first output of this group was to determine criteria for a recruitment program. The following is a list of these criteria—the program

- has high potential to be effective,
- is low cost with high return,
- must be sustainable,
- recognizes Penn State Altoona's unique concerns such as resources,
- targets students most likely to succeed in our technology programs,
- does not 'steal' students from other program,
- minimizes faculty time commitment to recruitment, and
- does not rely on the college wide recruitment processes.

Using these criteria as goals for a successful recruiting program, the committee used the principal of finding the lowest hanging fruit with the broadest potential. Fortunately, one of the committee members had already begun a relatively exhaustive study of potential methods that were tailored to engineering technology at Penn State Altoona. The committee narrowed this list

to three overlapping areas: target students already committed to Penn State, develop a multipronged approach focused on our targeted audience, and modify the technology programs.

Target Audience for Recruitment

Retention rates for engineering students, particularly in the first two years, are relatively low compared to other majors both nationally and at Penn State. At Penn State, the attrition rate in the first two years is about 1/2 of the incoming first year class. Penn State Altoona which offers the first two years of engineering has approximately 200 engineering students enrolled each year. Of these 40 to 60% leave the engineering program by the end of their sophomore year. Reasons for leaving range from personal issues, level of academic difficulty (particularly math), not interested in engineering, and low interest in the more theoretical end of engineering. Of those who leave engineering, very few transfer to a different school.

Noting that the EMET program is more hands on and less theoretical than engineering and that our total EMET enrollment goal is a class size of 35 (140 for the four years), we reasoned that the engineering program would be a good pool from which to recruit.³ Further, most of these students are committed to attending some program at Penn State.

Multipronged Recruitment for Target Audience

The next element was to develop recruitment methods to attract students from this group. Here the intent was to attract students for whom EMET would be a good fit and not *just* to get students into the program. Our approach was to inform engineering students in the EDSGN 100 course of the differences and similarities between engineering and engineering technology in a 40 minute presentation. The presentation consisted of three components: a video on our engineering technology programs, lecture/question answer, and facilities tour.

A DVD video was developed in 2006 that highlighted the difference between engineering technology and engineering. The DVD features interview with current students, alumni, faculty and industry representatives. To connect students to the hands-on nature of the EMET program, students in action—senior design projects, individual laboratories—are prominent. The peer-to-peer connection aids in information credibility.

The EMET program coordinator meets with all sections of EDSGN 100—typically 10 in the fall and 1 in the spring. The 40 minute presentation begins with a showing of the DVD. A brief lecture/question-answer follows that covers the two programs' similarities and differences such as

- academic content,
- types and range of jobs,
- salaries,
- job advancement,
- hiring prospects or marketability,
- companies that have hired our graduates, and
- graduate school opportunities.

The presentation is concluded with a tour of the EMET facilities.

Program Changes Affecting Recruitment

Integral to this recruitment method was a minor but consequential change to the technology programs: creating a common first year course that includes both engineers and engineering technologists and changing the EMET from a 2+2 program to a traditional 4 year program. Both of these changes occurred in 2006.

Prior to 2006, technology students took 3 separate 1 credit courses: mechanical drafting, introductory computer aided design (CAD), and introduction to engineering technology. Engineering students took a 3 credit introduction to engineering design that was separated into three areas: introduction to engineering design, computer tools, engineering drawing including CAD. Recognizing the common content of the three technology courses to the engineering course, the decision was made to develop one common 3 credit course, EDSGN 100. The intent of creating a common course was to increase interaction between students in the two majors to better understand their differences and commonalities and facilitate change of major without loss of time or credits. This common course also reduces under-enrolled classes which were a significant issue as the number of incoming technology students dwindled.

In 1996 when the EMET program was started, the MET and EET associate degree programs already existed. Taking advantage of these robust programs and desiring to minimize duplication of courses, the EMET program was designed as a 2+2. Students started in either of the EET or MET programs and then upon receipt of the associate degree, they applied to the EMET program. In the second two years, students cross trained in both electrical and mechanical disciplines. While there are many pros to this format, there was a significant downside. The idea of having to achieve an associate degree first was confusing to many students and their parents. Additionally, the number of students who intended to earn the EMET degree from the beginning increased and the number who desired only an associate degree dramatically decrease. This latter trend indicated that there was little need to keep the 2+2 format and in 2006 the EMET degree converted to a straight four year program.

Results

Data collected for the period of academic years 1999/2000 to 2010/2011 are shown in Table 2. The data, presented by academic year, shows the number of students who transferred from engineering into engineering technology. There is a demarcation of before and after 2006. Prior to 2006, the two majors did not take common courses and there was little effort to inform engineering students of the technology options. In 2006, pragmatic changes occurred and organized and focused recruitment efforts were put in place.

Table 2 Number of students who transferred from engineering into the EMET program within their first two semesters.

Transfer Year*	Number of Students Transferring into EMET
Fall 1999/ Spring 2000	2
Fall 2000/ Spring 2001	4
Fall 2001/ Spring 2002	3
Fall 2003/ Spring 2004	3
Fall 2004/ Spring 2005	2
Fall 2005/ Spring 2006	1
Introduction of common 1 st year course—EDSGN	
Fall 2006/ Spring 2007	15
Fall 2007/ Spring 2008	14
Fall 2008/ Spring 2009	15
Fall 2009/ Spring 2010	20
Fall 2010/ Spring 2011	18

*EDSGN 100 is taught in the fall (typically 10 sections) and spring (typically 1 section).

The transfer rate trend in Table 2 clearly shows a dramatic change that is attributed to our recruitment efforts. In the most recent 5 years, the average number of students transferring into the technology program has increased six fold over the years prior to 2006. These numbers meet or exceed our target goal of 15 transfer students per year with the exception of 2007/2008 which was short by 1.

Conclusions

The coordinated efforts of programmatic changes and targeted recruitment have taken our technology programs from a marginally viable program to a robust one with its own new set of issues. The programmatic changes were driven by both enrollment numbers, the students themselves (wanting a traditionally 4-year EMET program), and faculty interest in quality improvement. Fortunately, the program faculty were not so entrenched in the status quo that such changes were able to be enacted within a short period of time.

In addition to meeting our recruitment goals, the actions taken have met all of our criteria set at the onset of the project. At this time, Penn State Altoona EMET program has the largest enrollment of any discipline at our campus and resources constraints have replaced low enrollment concerns.

References

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