

RECRUITING FROM A NEW SOURCE

By

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Introduction

Small universities may come from any number of diverse backgrounds. For example, they may have a religious emphasis or they may have been the result of a philanthropist's desire. These small institutions must compete with much larger, state-funded colleges and universities. This competition for a limited pool of students each year requires smaller universities to "think outside the box".

Oklahoma Christian University (OC) is a small Christian (Church of Christ) liberal arts institution. In the mid -1980s a need was seen to develop an engineering program in our institutional arena and so OC launched its engineering program 17 years ago. The program originally offered two degree choices: Mechanical Engineering and Electrical Engineering. Both degrees are accredited by ABET. Over the past few years, the university has seen a need to expand its degree options, and Computer Engineering (ABET accreditation expected by September, 2005) has been added. These three programs currently sustain approximately 160 students from freshman to senior levels. More information about OC's engineering programs at can be found at www.oc.edu/engineering.

Small Universities Desire To Grow

Every small university has the desire to increase the size of its student body. The engineering program at OC is no different. The goal is to have a program that accommodates 220 students in five years. The program has been stagnant for most of the last several years. The primary reason behind OC's desire for growth is to relieve the university's general budget from subsidizing the program. With 220 students the program can support itself.

Sources of Students

For the religiously oriented university, the major source of students will be from churches that share the school's religious background. Most religious schools will set a limit on the number of students that can be recruited from outside their religious heritage. It is for this reason that these schools advertise in various but limited ways. Methods of advertising include the Internet, religious journals that appeal to a variety of backgrounds, and, of course, trying to be included in the "top" schools that are selected by Newsweek and similar magazines. All of these methods rely on prospective students reading the literature that is published.

The Development of New Sources

Developing new sources of students requires some creativity. Most of OC's traditional methods for recruiting have involved only the university's admissions staff. The university has moved beyond the traditional to the truly creative and now utilizes both faculty members and a specialized engineering recruiter. However, recruitment for the college of engineering has also gone beyond the usual recruiting fairs and now has the faculty and the engineering recruiter involved at the secondary classroom level in a new source: pre-engineering academies.

Pre-Engineering Academies

While universities have been asking how they can develop new sources of students, some secondary educators in Oklahoma have been asking how they can better prepare students for success in college engineering programs. An answer to both questions has been found with the development of high school pre-engineering academies. The development of these academies has brought K-12 educators, career tech educators, and university educators together to design a pathway that uses the strengths of each partner to better prepare students for entry into, and successful completion of, university engineering programs. The initial motivation for these academies was acknowledgement that the attrition level of students pursuing engineering degrees is far too high. That attrition rate is greater than 50% nationally. The rate in Oklahoma at some schools is greater than 60%. This attrition can be attributed to three primary factors:

1. Students' inadequate preparation for rigorous mathematics classes
2. Students' inadequate preparation for rigorous science classes
3. Lack of knowledge about the field of engineering itself

One Model

The Pre-Engineering Academy at Francis Tuttle Technology Center was developed to address these three concerns. Students who attend the Academy take their core math and science classes at the Technology Center as well as classes that introduce them to engineering concepts. Initially, the concept was to offer an "all-day" alternative to students interested in engineering. However, input from university partners convinced the Academy developers that opportunity to participate in clubs and organizations at the comprehensive high school is also important to potential engineering students. Therefore, the Academy was designed to allow high school students (sophomores, juniors and seniors) to attend one-half of each school day at their sending high school and the other half of the day at the Technology Center.

During their day at the Academy, each student is enrolled in one Pre-AP (Honors) or AP math class and one Pre-AP or AP science class. Each student also completes two engineering courses each year. The math and science classes are taught by secondary certified math and science teachers and meet all requirements of the Oklahoma State Board of Education. The engineering classes have been developed nationally by Project Lead the Way and are taught by the same math and science teachers – thus providing opportunity for effective integration of the core subjects into the elective classes.

The students themselves are selected based upon their stated career interests and their academic preparation prior to entering the Academy. All students must show an interest in engineering before being accepted, but the success of the Academy will be seen in students who decide NOT to become engineers as well as in those for whom the experience confirms their career choice. This helps ensure that only serious, prepared students ultimately select engineering as a college major and may help reduce attrition.

Academically, most of the students who are accepted into the Academy have already begun taking Pre-AP (Honors) classes and their average GPA is 3.0 or greater. The distinct advantage of completing their math and science at the Academy is that those classes will be comprised of a homogeneous population of students with similar interests and skills. In addition, as noted above, the concepts taught in the core classes are enhanced and enriched in the engineering classes.

As was pointed out by the university representatives in the early planning stages, many of the students are also actively involved in extra-curricular activities at their high school. Additionally, leadership opportunities are provided at the Academy. Public speaking skills are addressed as a result of input from Oklahoma Christian University representatives.

Every student who is accepted into the Academy is required to participate in a lengthy interview prior to enrollment. At least one parent or guardian must be at the interview to ensure parental support and to make certain that the family understands expectations. The Academy's partnership with Oklahoma universities is an important factor in parental support of the program.

Other "Pre-Engineering" Models

There are other Pre-Engineering Academies within the state of Oklahoma, though not all of them follow the Francis Tuttle model. For example, in a couple of cases either the math, the science or both are taught at the sending high school while the Project Lead the Way classes are taught at the local Career Tech. The Oklahoma Department of Career and Technology Education has been given oversight responsibilities for all of the Pre-Engineering Academies. The Oklahoma Department of Career and Technology Education has shown a willingness for other models to be tried but insists that the goal of all such programs be true college preparation for engineering careers.

The Development of a Relationship

The developers of the Francis Tuttle Pre-Engineering Academy desired to have community involvement in the program as well. They pursued this in two ways. First there was the Advisory Board. This board involves parents and guardians, local industry, and the university community. This board helps the Academy's leadership to build and improve the academic program. Secondly, the university component has been used to advise the Board primarily on the academic standards that are required by the university community. Some of the standards inputs have been the amount of homework required, prescribed study habits, communication standards for laboratory report writing and oral presentation of material, and social life involvement.

The university community, OC in particular, makes campus visits as requested by the Academy administration and/or faculty. The visits are usually scheduled in the fall at the startup of school, at least once during the school year, and at the close of the school year. Academy students also visit local universities. Oklahoma Christian is the closest to the Technology Center and provides tours of its campus for students to see the collegiate environment. These visits also provide an opportunity for OC students to get involved with the Academy students. Both the university students and faculty like to show off their projects to prospective students, especially ones interested in engineering.

Recruiters report that in most high school situations they receive professional courtesy at best. As the relationship between OC and Francis Tuttle has developed, the recruiter has been invited into the classroom to discuss getting into college, paying for college, college life, the difference between the large university and the small university, and any other topic that the Academy students may want to discuss. While these discussions are general, there is specific focus on OC.

Recruiting Efforts Develop Relationships

The development of relationships between OC and the faculty and administration of Francis Tuttle have opened the doors to a broader and more effective method of recruiting than just going to a school and setting up a display table for the university.

The Use of “Toys”

The use of “toys” may seem a bit trite. However, it has been observed that the students perk up and become more interested when introduced to them. The “toys” include a range of senior projects. They include the BAJA cars that go to the SAE competition as well as the IEEE robot that also goes to competition. Oklahoma Christian has also shown off to prospective students its involvement with humanitarian efforts, such as building an off-road wheelchair for a young man in Mexico who has no access to paved roads, electricity, or gasoline. Another humanitarian project built by OC Engineering students is a gas-powered drill to assist in drilling water wells in the dense bush country of Ghana, West Africa. The demonstration of these projects also develops the interest of parents.

Preparing the Way to a Future

A major part of the recruiting effort is answering questions about college life. Some of these prospective students have never been on a college campus, nor have they thought about what it may be like. The size of the campus the students will attend is also an important discussion. Small campuses, in general, have greater faculty/student involvement than larger universities. One of the major events at OC is the annual fall engineering party at the farm of one of the professors. Using the BAJA car promotes camaraderie between fellow students and faculty.

Oklahoma Christian has begun to introduce its engineering programs to high school students at an earlier point in their high school careers during the freshmen and sophomore years.

Recruiting at this level may seem somewhat out of place, but it gives students repeated looks at OC.

Another avenue to prepare and interact with these Pre-Engineering Academy students is through a mentoring program with college students. This was a new program this year and so no conclusions as to its effectiveness have yet been reached. We did learn that we need to develop specific guidelines for both the Academy and college students to follow. Three academy students tried the mentoring program on our robot project, but an effective evaluation tool has not been developed to follow up on their activities.

OC's Special Consideration

Most students, as well as most parents, are unsure how they are going to pay for college. The recruiting effort includes a discussion with the Academy students covering topics which include information on the various grants, scholarships, and federal assistance that is available. In order to encourage these students to study at OC, the application fees are waived. The engineering recruiter is also proposing a special scholarship for the academy students in an attempt to "prime the pre-engineering academy pump".

Time of Effort by OC Personnel

The amount of time spent at the pre-engineering academy by the OC faculty is about three days per school year, per academy. The time spent by the OC engineering recruiter is about 3 days per year. Additional time and attention will be given to those students who show interest and apply to OC. The use of student time is minimal as of this writing, but it is expected to increase to about 10 to 15 hours per year. The hours will be spread out among several students.

Future Work

Each summer OC holds a summer engineering academy for high school juniors and seniors. The pre-engineering academy students have been invited to take part. If the summer academy student matriculates at OC, the student is given credit for Intro to Engineering as a result of his participation.

A specific recruitment calendar is being developed for this effort. It will contain specific information on certain days. It will also have the fun days for the "toys" to be used.

This effort will be extended to other pre-engineering academies in the state of Oklahoma.

Conclusions

All interested parties benefit as a result of OC's and Francis Tuttle's efforts. The pre-engineering academy benefits by its association with a respected university. Oklahoma Christian benefits because of the prepared student pool available to its recruiting staff. The academy students benefit by gaining knowledge about college life, especially life at a small college.

Career Tech also has other academies that focus on health care, information technology, etcetera. The pre-engineering model that is being developed may serve as a model for these other academies. It could benefit nursing programs as well as computer science programs at the college level.

Biographical Information

William Ryan is Professor of Mechanical engineering at Oklahoma Christian University. He has 26 years of teaching experience with the last four being at OC. He has had 13 years of industrial experience before entering the teaching field. He also does consulting work through Ryan and Associates.

Tiffany Wiederstein is the Engineering Admissions Specialist for Oklahoma Christian University in Oklahoma City. She has 3 ½ years recruiting experience one of which has been specialized in Engineering. She also has 1 ½ years experience in Financial Services for the university.

Danny King is Assistant Director of the Portland Campus of Francis Tuttle Technology Center in Oklahoma City. He has 23 years of experience in Career and Technology Education as a teacher, counselor and administrator. In 1999 he was named the Outstanding Career Guidance Professional of the Year by the Association for Career and Technical Education.

Malcolm Fowler joined the Francis Tuttle Technology Center in 1986 and has served as the Director of the Portland Campus for ten years. Malcolm and his wife Patricia have been married for 22 years. He has four daughters and recently became a grandfather. He holds a Bachelor of Science degree from Southern Illinois University and a Master of Science from Oklahoma State University.