

“IF THEY KNOW, THEY WILL COME:”
Collaboration between Penn State Harrisburg SDCET Program and Secondary
Education

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Abstract

High school graduates continuing their formal schooling at higher education institutions may experience confusion as they explore and try to understand possible careers related to majors they think they want to pursue. High school counselors and teachers strive to keep abreast of the changes and advancements in new and transforming careers in order to properly advise students. This information is important as students schedule classes during their high school and apply to colleges/universities that offer those majors. However, high school counselors and teachers have more responsibilities to inform students, and their guidance and instructional personnel may not be able to keep up with, the advancements and changes in careers. As a result, the college's relationships to secondary education schools are a critical element to their success, particularly for specialized majors. These programs must strive to foster and strengthen these relationships that will benefit their programs as well as their graduates and chosen professions.

This paper will discuss the relationship between Penn State Harrisburg's construction program and secondary education. Penn State Harrisburg's program engages in outreach activities that encourage schools to invite our representatives into their classrooms to partner with them and also by allowing secondary education students to shadow with professors. This relationship results students in becoming more aware of the numerous aspects of the construction industry, its changes, and the career opportunities available to them. The initiatives are outstanding examples of a win-win relationship for a university program, secondary education and more importantly the students. This paper also shows that through the relationship between the university program and secondary education high schools also have recognized Penn State Harrisburg's construction degree as an exceptional major.

Introduction

Partnership between an Educational Institution and Secondary Schools is not a new concept in fostering learning among students. There are many universities that work closely with high schools to develop a relationship to help fit students' needs. Universities and high schools traditionally maintained collaborations by including student job shadowing, outreach activities, faculty exchanges, and recruiting. The purpose of these partnerships is to expose high school students to the major so they can plan ahead to meet the needs of industries, governments, national laboratories, and the training need.

The goal of any university engineering technology curriculum is to provide the information and skills so each student so they can be successful in their chosen career. This is especially critical for a construction engineering technology program. The program is

continuously planning, developing, and modifying its curriculum to keep abreast of the changes and advancements being made in the construction and engineering profession. The secondary school relationships and partnerships that a program develops are critical elements to its success. Programs that foster and strengthen relationships with secondary school teachers will not only benefit the program but also help high school students have a better understanding what construction and engineering professions do.

Advisory Board

Public schools monitor who is allowed to participate in their school activities. They are selective in inviting individuals into their schools or make class presentations, not willing to share personnel names, and do not usually distribute outsider information to students. Nonetheless, schools receive numerous requests from a wide variety of outside groups who want to come in and give presentations or provide materials for distribution. This is not the case for the Structural Design and Construction Engineering Technology program. A valuable member on the Structural Design and Construction Engineering Technology program is a high school counselor. This person brings a unique and valuable resource to this board. The counselor participates on issues by providing a different perspective to educational activity. They are also very much interested in learning about the structural engineering & construction industry, the skills that industry requires, the job opportunities, education beyond high school and in particular the SDCET program. The counselor also shares information that helps the program reach the high school students, as well as opens doors within the school. Board members are invited to be guest speakers at school activities, the SDCET program is welcomed into classes to interact with students, and further, serves as a resource for other counselors. The board members and counselor(s) view this as a win-win relationship.

The SDCET Advisory Board hosts a Counselor Awareness Luncheon in conjunction with the annual SDCET Career Fair. A personal letter is sent to the local area school counselors inviting them to a free lunch and to listen to presentation. The presentation makes the counselor aware of the construction industry, its future manpower needs, the educational requirements involved, and opportunities for students. There is a brief overview of SDCET program. The list of counselors' names and addresses are provided by the advisory board counselor member. The counselors sometimes ask to bring one or two of their students to the luncheon. The Advisory Board feels that making the counselor aware of the construction industry and educational requirements provides an excellent foundation for the counselor when advising students.

The membership composition provides valuable resources to legal and state licensure, exposure and interaction to secondary schools, interfacing with various audiences and employers of the construction industry, and an advocate to the program. The advisory board acts in advisory capacity to the SDCET program, the School of Science, Engineering and Technology, and the college. Each member of the advisory board is chosen by their position and/or expertise in the industry, government, and academics. The advisory board committee meets and reviews applicants' resumes and then selects the applicant or applicants that are best fit for the advisory board. There is a cap of 22 members that can serve in the advisory board.

The SDCET Advisory board has been identified by the college to be an excellent example of an outstanding board¹. Their activities show how different an industry and a construction program benefits. The advisory board activities include: construction awareness

luncheon for high school counselors, review of course syllabi, informal gatherings, student forums, a networking evening, and resource to the program and faculty.

Job Shadowing

High school graduates continuing their formal schooling at higher education institutions may experience confusion during their high school years as they explore and try to understand possible careers related to majors they think they want to pursue. High school counselors and teachers strive to keep abreast of the changes and advancements in new and transforming careers in order to properly advise students. That is why Penn State Harrisburg teams up with local high schools to try to encourage high school students to consider studying math, science, technology, and engineering. One way of doing this is through job shadowing. One of the best ways to learn about a job or a profession is to job shadow. Job shadowing is a work experience option where high school students learn about a specific job by walking through the work day as a shadow along side of an expert in a chosen field. The shadowing work experience is an unpaid exposure to the workplace in an occupational area of interest to the high school student. This helps the student witness firsthand the work environment, occupational skills in practice, the type of professional training, and career options. It also is designed to increase career awareness and help model students' behavior through examples. This can help the student link between classroom learning and work requirements.

The day job shadowing schedule at Penn State Harrisburg consists the following:

- Get to know the student that will be shadowing the professor by asking what they want to learn out of this experience.
- Allow the student to attend the classes to get a better feel of a college setting as well as what they will be learning in their chosen profession.
- Go through a brief description of all the types of engineering professions, job outlook and pay, classes needed to take for that specific profession, technology they may be using, and many more.
- Allow the student to ask questions that may help them make their decision about their career choice.

One example from a high school student that shadowed a professor has stated that they had quite an experience from attending the lectures, learning about careers in engineering, and what type of education is needed for engineering. Overall, the student found engineering very interesting. The purpose of the visit is to expand the student's thinking and give more options to make better career decisions. This also helps the student to plan ahead, not be scared in entering a university or college for the first time, and be more confident in their future decisions.

Secondary School Activities on Campus

Penn State Harrisburg's Science and Engineering Department also brings middle school and high school students on campus for many events that take place. Some of these events are student completions and awards, science fairs, and guest speakers.

MATHCOUNTS is a nationwide program for 6th, 7th, and 8th grade students designed to promote excellence in mathematics through coaching and competition. The local event in the Capital Union Building at Penn State Harrisburg is organized each year by the Harrisburg Chapter of the Pennsylvania Society of Professional Engineers along with many volunteers. This event brings in more than 180 area schoolchildren to participate in the day-long competition which begins with the "Sprint Round" at 9:45 a.m. and closes with the "Countdown Round" at 1:05 p.m. The awards presentation is scheduled for 2:00 p.m. Local chapter members, Penn State Harrisburg School of Science, Engineering, and Technology students and faculty volunteers, and sponsors distribute materials to participating schools, coordinate the competition site, perform fund-raising duties, provide lunches, score and tabulate the results, and present the awards.

This program is designed to build skills, promote strategic problem solving, and instruct students in dealing with complex problems and hard-to-handle numbers – all critical parts of our technological society. This event begins in the fall and covers everything from basic arithmetic skills to math logic, probability and statistics, linear algebra, and polynomials². The actual competition starts in January with in-school qualifying tests, followed by the February regional event on Penn State Harrisburg's campus. Each year, more than 500,000 students nationwide are exposed to MATHCOUNTS at the local school level.

Penn State Harrisburg also co-sponsors, along with other area colleges and universities, the International Science and Engineering Fair, which is a part of the Capital Science and Engineering Fair. This fair encourages junior high and high school students to creatively explore and investigate through hands-on scientific research. This event takes place during the month of February, once a year. Each year, more than 300 aspiring local scientists, mathematicians and engineers, grades seven through 12, exhibit their projects in one of 15 categories. After a two-day competition, two senior high students are chosen as grand champions to compete at the International Science and Engineering Fair. The fair is a vehicle where students can demonstrate how they solved a problem or answered a question using scientific methods. Learning takes place during this process that touches all subject areas in engineering and science. This helps the students develop a competency and mastery of math and technology skills, which can also help them in their career path. This event takes place off campus at the Whitaker Center in Downtown Harrisburg, PA.

In addition to sponsoring events on or off campus, Penn State Harrisburg also invites exciting guest speakers for all students (college and secondary education) to attend. One in particular was the host of "Mysthbuster" on the Discovery Channel, Grant Imahara. This event brought a lot of students to Penn State Harrisburg to see some live experiments performed by Grant Imahara and ask questions. This involvement also brought more of an interest into the science and engineering fields from secondary education students that attended.

ACE

A national movement is in place to educate students about an exciting career. Architecture, Engineering and Construction (ACE) is national organization that helps high school students learn about these careers while working on a project during an academic year. The students learn from professionals about their disciplines and how it relates to the project that the student teams must complete. The professionals mentor the students on their project so the students learn first hand about that profession. Integrated into the project is an invitation to the students to visit Penn State Harrisburg and learn about the various degrees that are offered. The high school students network with college students majoring in these degrees thereby hearing about the college from a

student's perspective. The ACE program is an after school activity that covers four counties around Penn State Harrisburg. There are approximately 170 students currently involved in this program.

The above activities demonstrate the winning partnership Penn State has with secondary education. The SDCET is a regionally recognized program and attracts a steady stream of students from this area. The Structural Design, Construction, and Engineering Technology (SDCET) Advisory board is unique in that its membership is a representative in various aspects of the construction industry. The bylaws requires the 21 membership to consist of SDCET graduates, small and large construction firms in addition to engineering companies which may have national and/or regional recognition in various aspects of the construction industry. The board also includes a representative from Pennsylvania Department of Transportation (Penn DOT), Associate General Contractors of America (AGC), Associated Builders and Contractors (ABC), a lawyer in construction law, an architect, and even a high school counselor. They represent private, public and the government sections as well as other professionals

Conclusions

The various activities and organizations from the advisory board, financial support, student organization partnerships, job shadowing, and activities on campus demonstrate the partnerships universities can have with the secondary education. This partnership is a win-win relationship because at the end, they both help each other. They also both realize the need to work together for the betterment of the students and the construction industry's future.

A great step in strengthening the economic base and workforce in the construction industry is creating the programs mentioned above with the collaboration of secondary schools. Students will become future leaders, and both parties have a responsibility to educate the students about their profession. The various activities and rewards are only limited to the amount of commitment the construction program places on these relationships. The programs that foster and strengthen the relationships will not only benefit but will give the students a better feel about the engineering and construction majors as well as enrolling in college. The more the students get exposed to the various activities and organizations that the school provides, the better prepared the student will be to face the challenges of the real world.

References

1. "Currents," Penn State Alumni Magazine, Fall 2006.
2. MATHCOUNTS. www.mathcounts.org. Accessed on September 23, 2009.