

AC 2008-1628: A MODEL PARTNERSHIP BETWEEN PENN STATE HARRISBURG'S CONSTRUCTION ENGINEERING TECHNOLOGY PROGRAM AND THE CONSTRUCTION INDUSTRY

Sofia Vidalis, Pennsylvania State University-Harrisburg

Dr. Vidalis is an assistant professor of Civil Engineering at Penn State Capital College in Harrisburg, PA. She earned her B.S., M.S., and Ph.D. from the University of Florida. She has worked with Florida Design Consultants for a couple years as a Transportation Engineer. Her current research focuses on quality assurance in pavement construction and materials, construction management, and transportation planning and operations.

Joseph Cecere, Pennsylvania State University-Harrisburg

Dr. Cecere is an associate professor of engineering and program chair of the Structural Design & Construction Engineering Technology at Penn State Harrisburg. He is a member of AGC Education Committee, Killinger Research subcommittee, AIC Professional Constructor Certification board, and he just completed a six year term on the AGC Research and Education Foundation. Dr. Cecere expertise area is construction management, scheduling, safety and estimating.

A Model Partnership Between Penn State Harrisburg's Structural Design and Construction Engineering Technology Program And The Construction Industry

Abstract

The goal of any engineering technology curriculum at a university is to provide the information and skills so that each student can be successful in his/her chosen career path. This is especially critical for a construction engineering technology program because of the high demand of jobs in the construction industry. The construction industry is constantly changing over the years and this means that university programs should also keep up with that change. That is why the program at Penn State Harrisburg is continuously planning, developing, and modifying its curriculum to keep abreast of the changes and advancements being made in the construction profession. The industrial relationships and partnerships that a program develops are critical elements to its success. The programs that foster and strengthen relationships with construction firms and professional associations will not only benefit the program but also those firms and associations.

This paper will discuss the connection between Penn State Harrisburg's Structural Design and Construction Engineering Technology program and the construction industry. Various activities such as student organizations, career fairs, guest speakers, internships, capstone projects, field trips to construction sites, and professional meetings have revealed excellent examples of a win-win relationship for both the Construction Engineering Technology program at Penn State Harrisburg and its partners in the construction industry.

Introduction

Partnership between Educational Institution and Industry is not a new concept in fostering learning among students. There are many universities that work closely with business, government, and industry partners to develop programs to fit their needs. Universities and industries traditionally maintained collaborations by including student internships, faculty exchanges, and industry design projects to complete a degree program. The purpose of these partnerships is to meet the needs of industries, governments, national laboratories, and the training needs of the university students.

The goal of any university engineering technology curriculum is to provide the information and skills so each student can be successful in a 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 profession. The industrial relationships and partnerships that a program develops are critical elements to its success. Programs that foster and strengthen relationships with construction firms and professional associations will not only benefit the program but also construction firms and associations.

The purpose of this paper is to discuss the connections between Penn State Harrisburg's Structural Design and Construction Engineering Technology (SDCET) program and the construction industry. This paper will also discuss the various activities and programs for partnership that are conducted from the advisory board, student organizations, national construction associations, financial support, and outreach. These various activities and programs have revealed excellent examples of a win-win relationship, which benefits both the university program and its partners.

Advisory Board

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 by laws 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

Members

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.

One of their goals is to identify the needs and trends regarding employment of the SDCET graduates. The board offers recommendations for improvement to the curriculum offerings and serves as an avenue of communication between the SDCET program and the construction industry. The board assists in preparation of surveys and reports as required for their accreditation as well as other information the SDCET program. They promote financial support to the program and the student organization, Penn State Professional Engineers and Contractors (PSPEC).

The SDCET Advisory board has been identified by the college to be an excellent example of an outstanding board ¹. 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.

Professional Activities and Events

The advisory board hosts a luncheon that is held at Penn State Harrisburg to inform high school counselors about the construction industry: its economics, workforce, and job opportunities. During this luncheon, the advisory board presents and provides information on the SDCET program and why they feel it is excellent for high school students interested in the construction and design engineering profession. The SDCET Career Fair is held right after the luncheon to which the counselors are also invited to attend to learn more about the industry from the various firms in attendance. The firms that attend the career fair provide displays and information about their companies. Most importantly, students have the opportunity to talk with the recruiters from many design and construction firms and also have informal interviews about full-time, part-time, and internship/co-op positions. This event is always successful and numerous contacts are always made, which benefits both the firms and the students. It is also an excellent occasion to inform a key person to students on their career path about the construction industry. The counselors have provided an opportunity for the SDCET program to participate in numerous high school events, which are limited to other professions. This annual event has provided a great opportunity for counselors, firms, faculty, and students to network together.

The “Network Night” event is an informal gathering for Penn State alumni, students, and the advisory board of SDCET¹. The relaxed atmosphere with light refreshments makes the current students comfortable as they meet graduates; learn about the jobs, and network. During this event, students are able to gain valuable information to contribute in professional growth. The advisory board was recognized and won a university award for this event. A Student Forum is done annually by the advisory board. This allows SDCET students to have the opportunity to network with the advisory board members and ask questions about the program.

Academic Advising

The board annually reviews several course syllabi to ensure the material is current to the industry as well as provide advice to the instructors on course structure. A group of board members with the expertise in a particular subject in construction and design engineering reviews the material with the instructors of the courses. The board may also include key employees within their organization to assist in the review process. The constant interaction between academia and the industry is an essential requirement to train and develop students to have the knowledge of what is expected in the real world. The board’s suggestions are valuable and therefore are incorporated in the SDCET courses. The instructors also continue their relationships with the board’s firm in consulting, research, or other activities to provide a win-win partnership.

The advisory board is also an excellent resource to the program and faculty. One of the benefits of being on the advisory board is maintaining the relationship with faculty and students. Advisory board members have the opportunity to also be a guest speaker in SDCET courses as well as provide assistance on field trips. The feedback from students indicated that they enjoyed and benefited from guest speakers. They showed great support, asked a lot of questions, and enjoyed hearing practicing professionals about the subject matter, which supplemented the instructor’s material. The field trips are field hand exposure to what the student learned in SDCET courses. The advisory board member has the ability to network with the students as well

as inform them about their firm. This continues to be an excellent way for summer internships and permanent jobs.

The advisory board communicates with the school and university administration on issues that affect the SDCET program. The administration knows how involved they are with the program and that they value their comments. The board involvement to the administration is valuable to a successful program. The program includes the advisory board members on faculty searches. Their input provides another perspective of the candidates' experience and opportunities. Their participation also educates the board members in the academic process of seeking and hiring faculty.

Student Organization Partnerships

Penn State Professional Engineers and Contractors (PSPEC) is an umbrella organization of three national associations: Associated General Contractors, Associated Builders and Contractors and the National Society of Professional Engineers. The club's activities and commitment to the program is a key component to the student's education, for professional growth, and also to keep them current with the construction industry. Members of PSPEC also produce a resume book annually, which is sent to more than 150 firms. This book contains resumes of students in the SDCET program and it is separated into three sections. The first section provides information and a brief overview about the SDCET program, the typical course of study the students take, and the course description. The second section contains resumes from graduating seniors, for full-time positions. The last section contains resumes of students who are seeking summer employment or part-time positions. PSPEC gets involved with various activities with the industry. The various activities include: inviting guest speakers, arrange construction project visits, and local sponsoring chapters activities ².

Guest Speakers

Inviting guest speakers to make a presentation, as stated earlier, help the students learn different aspects of the construction industry. The speakers bring valuable educational opportunities to the students about topics by owners, managers, clients and even alumni graduates from Penn State University programs that are involved in that profession. PSPEC also arranges construction project visits with firms. In some cases, the projects are restricted to the outside arena but student organization obtains access to these sites. The firm realizes the importance of assisting the students in their education. PSPEC conducts an annual two-day field trip to Pittsburgh, Pennsylvania towards the end of October, which includes visiting several projects and attending a dinner with the highway and building contractors ³. In addition, another one-day field trip to Baltimore, Maryland is made in the spring. These trips include high-rise buildings, bridges, institutional, or transportation projects, concrete batch plants, engineer/contractor offices, and testing laboratories. The members are provided first-hand knowledge of how the process is done which helps them relate to things discussed in the classroom. Most project sites allow the students to actually be there next to the workers performing the work. Being in a tunnel that is being dug, going down into a caisson in the middle of a river, seeing concrete poured at 1,200 feet above the ground, or driving a highway that you had walked on during a field trip are experiences these students will always remember.

Events and Activities

In addition, PSPEC also has a number of members that attend “CONEXPO” which is held every four years in Las Vegas, Nevada. Students that attend the world construction exposition get to see new construction equipment and technology, exhibits, education sessions, certification programs, and conferences. They also have the opportunity to network with industry professionals at the CONEXPO⁴. The event is also held in conjunction with the national AGC conference at the same site so the students participate in both events.

PSPEC sponsoring chapters have the members involved in their activities. Several students are invited to attend the monthly meeting so they can interact with the members. The chapter allows students to attend seminars that are of interest. Most chapters have an education committee that serves as the liaison to the student chapter. This committee conducts fundraising activities that support the student chapter and/or the program. Depending on the local chapter, these funds are given to the program, available to the student chapter for their activities, or used to help defer the cost of attending the national conferences.

National Construction Associations

Associations like Associated General Contractors of America (AGC), Associated Builders and Contractors (ABC), and Pennsylvania Society for Professional Engineers (PSPEC) understands the importance of higher education and their relationships to programs like SDCET. They provide a variety of educational and research programs that support construction education and the student who are entering their profession. These associations offer numerous types of scholarships, awards, recognitions, up-to-date information, training opportunities, and conferences. The following shows some of what the associations offer:

- The associations offer undergraduate scholarships to students in accredited construction and civil engineering programs. The successful recipients receive the scholarship annually while completing their degree. This makes a difference in their education. The foundations also provide a limited number of graduate scholarships. The SDCET program has been successful with numerous students receiving the undergraduate scholarships in the past⁵.
- Several constructor associations recognize a university instructor who prepares these students for the construction industry. This award that is given at their national meeting, allows the association to acknowledge the accomplishments of faculty who have contributed to their programs and the construction industry. A SDCET faculty member has received this prestige award in the past.
- The construction associations recognize the value of faculty participating on their committees. The faculty is a key player to the constructors in developing educational initiatives and supporting students. This is an excellent chance for the construction industry to interact with faculty towards educating the future constructors. SDCET faculty members have been appointed to numerous of these national association committees as well.

- The AGC's Education and Research Foundation board comprises of past national AGC presidents and two educators. They oversee the selection of the undergraduate and graduate scholarships recipients as well as awarding university research projects. The foundation identifies the research and solicits universities to seek funding. The SDCET chairman recently completed his second three-year term on the foundation board. Again, this relationship has provided a win-win partnership.
- One association allows student access to their web site, which provides up-to-date information on legislative issues, training opportunities, safety standards, and copies of standard documents that are used in most of the construction projects in the United States. It is a good resource and research tool that students can use.
- Most of these associations allow the students to attend their national conference for a nominal fee. The students have the same opportunities as the association members in attending presentations, visit exhibit areas, and network events. This has proven to provide internships, jobs, discounts to software and products and partnerships with the program.

Financial Support

The first college endowment was created for the SDCET program to provide scholarships to students in the major. Additional endowments have been created to support faculty, research, outreach programs, student development, and more student scholarships. Various construction and engineering firms as well as alumni have shown their support to the program generated funds to support these endowments. The local construction & engineering associations have also created their own undergraduate scholarships with one criterion being that the student must be majoring in the SDCET program. This demonstrates their commitment and their partnership to Penn State Harrisburg.

Outreach Programs

Another key partnership with the construction profession is SDCET outreach. The activities have fostered into a rewarding experience for both the firms and the SDCET program. Some of these activities include: research, part time job opportunities, continuation of education, workshops, and many other opportunities of keeping current with the industry.

- The construction industry has provided frequent opportunities for the program's faculty. Faculty has consulted with firms to specific initiatives or research projects. Some of these partnerships have developed into a funded research project for the faculty member. This partnership has supported the knowledge to firms and the program.
- The firms have hired faculty during the summer. This allows the faculty member to keep current in the industry, which is essential in the constantly moving industry. The faculty member takes this experience back to the classroom so the curriculum is integrating this material. The firm's also benefits from the faculty members expertise and skills, which becomes a valuable resource. The firm continues the partnership with the faculty member

during the academic year. This partnership provides firms an opportunity to become more involved with the program, its students, and their future employees.

- The SDCET program offers outreach programs to the construction community, which has benefited in this partnership. A firm has contracted on site training from the college on specific topic, which the SDCET faculty is the instructor. The program offers workshops, presentations, and continuing education courses that give opportunity for various firms to obtain the information. These professions may be required to obtain training or continue their learning in approved Continuing Education Unit (CEU) programs. The university's resources have provided an excellent environment to deliver the program at one location, state wide, and by the Internet superhighway across the world. The SDCET program continues to partner with the construction industry and contribute its future.

Conclusions

The various activities and organizations from the advisory board, financial support, student organization partnerships, national construction associations, and outreach programs demonstrate the partnerships universities can have with the construction industry. This partnership model between the industry partners and the SDCET program 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 the industry, government, faculty, and 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 relationships with construction firms and professional associations will not only benefit the program but also those firms and associations. 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. Science and Engineering Technology (SET) News (Fall 2005), www.cl.psu.edu/set/docs/set_newsletter_fallsoo5.pdf, Accessed 1/12/08.
3. "Executive Summary," Constructors Association of Western PA. Newsletter, November 2007
4. CONEXPO (2008). <http://www.conexpoconagg.com/>. Accessed 1/10/08.
5. "AGC Education and Research Foundation Annual," Associated General Contractors of America, February 2007.