

CONNECTING INDUSTRY AND ACADEMICS THROUGH THE ACE MENTORING PROGRAM

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With the increased need of construction professionals, there is a need to recruit and retain employees. One program that has been successful in increasing the exposure of architecture, construction and engineering is The ACE Mentoring Program, Inc. The program is active in 31 states and has touched over 30,000 students. This collaboration currently connects construction professionals by mentoring inner-city high school students through the design, estimate and proposal process of a real construction project. The rewards for the students are scholarships sponsored by firms. The reward for the firms is assisting in the opportunities of youth in their city. The reward for academia is the influx of a new and diverse student.

Key Words: Student recruitment, Construction mentoring, industry mentoring

Introduction

In 1995, Charles H. Thornton created the ACE Mentoring as a not-for-profit organization to bring industry professionals together to mentor high school students in inner-city schools (ACE Mentor, 2007; Post, 2001). After trial and error of techniques in mentoring in New York City, the ACE model began with seventeen companies and ninety students divided into three teams. Now there are affiliates in 31 states touching the lives of over 30,000 students (ACE Mentor, 2007). The newest additions to the teams are college students from the Building Construction Management (BCM) program in the College of Technology at Purdue University in West Lafayette, IN. This was the first year that collaboration was initiated with the ACE Mentoring and with Mechanical Contractors Association of America (MCAA). The history of the formation of the ACE mentoring program in Indianapolis, IN, the progress that has been made, and the future directions as related to academic research are outlined in this paper

History

ACE is an abbreviation for architecture, construction and engineering. It is an attempt to fill gaps in the need for construction professionals while tapping into resources of inner-city youth that lack direction (Tuchman, 2001). The program works with high schools as an after-school type activity. Mentors are industry professionals who meet with the students for two hours, twice per month beginning in the fall and continuing to the end of the school year in May. Students are introduced to the various design professions and the role that each performs in planning, designing and constructing a project. Students also gain first hand insight into the design industry by touring project offices and visiting active construction sites. In addition, students work closely with their mentors to solve challenging "real world" projects (ACE Mentor, 2007).

The fall semester is a learning time for the students. They visit pre-arranged offices, jobsites and industry related locations, usually organized by the mentors as way to introduce their occupations to the students. The goal of the program is to encourage youth to attend college, ideally in the area of architecture, construction or engineering. To educate the students about college, a college night is arranged for each team. During that time representatives from programs within Indiana [Ball State University (architecture), Purdue University (Construction and engineering) and Indiana University – Purdue University – Indianapolis (Construction and engineering)] are represented at this meeting and assist the students with questions regarding admissions, application and other college specific issues. At this time scholarship opportunities are also explained. Indiana has begun to reward high school students with special funds to attend state institutions. There are also ACE scholarships available at two levels. The local ACE in Indianapolis has scholarship funds raised from their organization, and the national ACE scholarships are available. There are also industry related scholarships, related to architects, engineers or construction professional organizations that the students are also informed about through mentors connections with industry.

At the end of the fall semester, the high school students then pick a design project that will be developed during the assigned times. They will produce drawings, schedules, estimates and finally a professional proposal presentation. The program has been successful due to the dedication of mentors as role models, and the commitment to the students to complete the assigned tasks. The benefits of this program beyond the high school students are the networking opportunities for the mentors. This non-competitive opportunity for collaboration with architects, engineers, and construction managers is priceless. This interaction becomes a conduit for future work for the mentors in their professions.

The construction industry in this state employed 157,900 workers in 2002, an increase of 1,300 workers from 2001; the number continued to increase through 2004 (Chakrabarty, 2001). The report by a statewide occupational coordination committee and the monthly reports posted by this state's Department of Workforce Development revealed that the shortage of workers in construction would continue into 2008 (Inews, 2004). Table 1 shows the construction project projections in the major metropolitan area of this Midwestern state as compared to the total construction in the United States during the same period.

Table 1

Construction Industry Projections (2001 - 2005)

	Area of Industry	Change in dollars (in billions)	Percentage Increase
Major Metro Area	Total Construction	\$1.60	22.3%
Major Metro Area	Non-residential	\$1.20	36.7%
Major Metro Area	Non-residential buildings	\$1.15	49.6%
U.S. Overall			4.6%

(Fmi, 2005)

As shown above, construction in this metro area has been increasing. In an effort to assist in the development of necessary workforce for these projects, fifteen firms working on the New Indianapolis Airport project decided to bring the ACE Mentor program to their Indiana. Wanting to align with the needs of the city, two public high schools in the Indianapolis Public Schools District (IPS) were chosen to form teams during the inaugural year. This school district reports that 75% of the students are on free lunch / textbooks and the ethnicity is illustrated in Table 2. It is shown that the White population is decreasing each year. This metro area aligns with the mission of the ACE program to reach and assist inner-city youth.

Table 2,

IPS Public School Ethnicity Distribution

Year		Native Am.	Black	Asian	Hispanic	White	Muti-Racial
2007-08		71, 0.2%	20335, 57.7%	105, 0.3%	4871, 13.8%	8320, 23.6%	1563, 4.4%
2006-07		74, 0.2%	21398, 57.7%	134, 0.4%	4624, 12.5%	9262, 25.0%	1565, 4.2%
2005-06		66, 0.2%	22134, 58.0%	136, 0.4%	4386, 11.5%	10027, 26.3%	1393, 3.7%
2004-05		55, 0.1%	22478, 57.7%	180, 0.5%	3949, 10.1%	10922, 28.1%	1347, 3.5%
2003-04		66, 0.2%	23086, 57.7%	160, 0.4%	3575, 8.9%	11846, 29.6%	1255, 3.1%

(Indiana Department of Education, 2007)

Progress

The first year (2005 – 2006 academic year), nineteen students completed the program with the assistance of 32 mentors. These students presented their projects to 160 construction professionals in May 2006. Six of these students were awarded scholarships for college totaling \$20,000. Students visited the New Indianapolis Airport project to watch the progress of construction. Forty students visited that project. A “mock bid day” was instituted with role playing simulations of pre-construction meetings, estimation activities, and quote analysis.

Mentors played realistic parts of owner and subcontractors to show that not everyone is nice and friendly in the real construction world. The students worked through the process and some even caught on to the game of pleading with the subs “Can’t you do better on that price?”

The second year (2006 – 2007 academic year) added one more school, and increased to 27 students with 35 mentors. The field trips continued with the attendance of the “beam signing event” for the last beam placed at the terminal for the new airport. College connections were also increased with the additional information regarding the deadlines and process for applying to colleges. The awards dinner, which has become the major fundraiser for the program, was sold out for the venue with 220 guests attending. Eleven students were awarded a total of \$34,000 in scholarships. The proceeds from the dinner will be used for future scholarships..

Currently in the third year, the count is 48 students in four schools. A school outside of the IPS district has been added. The new school district has a free lunch / textbook percentage of 50% (IN Department of Education, 2007). They also have a construction project active on their school grounds that will serve as a unique field trip experience because they can watch the project as it advances to different stages. The awards dinner has already been scheduled for May 15, 2008 with the ability to accommodate 400 guests. There are over 40 mentors. The scholarship fund has now surpassed \$70,000 with \$54,000 being awarded to date.

Future Directions

Developmental theorists view adolescence and young adulthood as a turbulent time and a period in which a sense of integrated self must be developed to succeed in establishing a career as an adult (Erikson, 1968; Holland, 1985). This is shown through the hardships of the inner-city students that the ACE Mentoring program has connected. Adolescents must search within themselves to provide a firm basis for adulthood (Erikson, 1968). Additionally, social learning theory examines how students explore a college major and the role played by external forces through modeling or socialization (Bandura, 1985). One of the most useful practices in career development research has been the application of self-efficacy theory to the study of educational and vocational behavior (Betz & Hackett, 1981). Accordingly, students’ beliefs about their educational and occupational capabilities are significantly related to the nature and range of career options they consider (Betz & Voyten, 1997). The ACE mentoring program allows students to experience real world examples of career activities to make them more confident in themselves and understand architecture, construction and engineering.

Research in career development has indicated that students choosing a career are unlikely to select one that is perceived negatively (Kimweli & Richards, 1999). Studies have been conducted examining attitudes toward construction as a career from the perspective of high school students. Swoboda and Cieslik (1997) surveyed 529 high school junior and senior year students. Data were collected to assess students’ general attitude towards construction. Seventy-two percent of the students knew someone working in the construction industry, however, 61% answered no to any items related to choosing a career in construction. The survey focused on areas of awareness, training, pay, and opinion/perception. The study identified correlations to different groups of people (high school students, craft workers, and associate degree students in construction management) but did not find any positive qualities or images of the construction

industry. The replication of this study, or one similar, with ACE Mentored students would show if this program assists in improving the image of construction.

The general image of construction was one of hard work, unsafe, and dirty conditions. The craft shortage had been likened to a “Dead Man Walking.” The perception was that there were no employees because of unsafe conditions (Rosenbaum, Rubin, & Powers, 2001). In the Jobs Rated Almanac, occupations were analyzed according to six key criteria including environment, income, employment outlook, physical demands, security, and stress; using data from such sources as the U.S. Bureau of Labor Statistics, U.S. Census Bureau, and studies from trade associations and industry groups (Lee, 2004). Unfortunately, construction rated as one of the ten worst occupations because the environmental and physical demands were perceived as being the equivalent of working outside digging ditches in the rain. “Public opinion has many times thought that persons choosing construction as occupations were stubborn, physical slobs, contractual cheats, sexist, always unclean or dirty” (Williamson, III & Grankowski, 1997). The founder of ACE, Charles H. Thornton, “thinks construction is glamorous enough, is extremely rewarding and pays adequately (editorial, 2001). The program encourages the students to complete high school with the encouragement of attending college, but most of all to have fun at what they do.

These theories are ones that align to the ACE Mentoring program. Although a formal study has not been published, the leaders of the programs have demonstrated their dedication. The newest aspect of the program is the addition of college students as part of the mentor team. The integration of college students has not been consistent as initially intended due to scheduling conflicts. A new mentoring program in the BCM program is going to allow students to schedule the time for ACE into their schedule. This will be available beginning the Fall of 2008.

At Purdue University, their construction advisory council members for the BCM department were participating with ACE in other parts of the U.S.. Their positive experiences lead to the encouragement of this department to join. With this request, one faculty member is now on the Board of Directors for the ACE of Indianapolis. The diversity subcommittee of this department has also spread the word about ACE to other contractors in the current Metro area of Indianapolis. The expansion has gone from the major commercial contractors to spark the interest of large residential contractors that also have an interest in increasing the interest in the industry.

ACE mentoring is addressing the major issue of the lack of diversity in the construction workforce. The networking of high school students with industry designers, architects, and construction professionals on a team assist in demonstrating these occupations. It gives the students positive role models to follow. Currently, the Department of Labor reports that the labor force (non-military) is 82% white, but by 2016 will drop to 79% (Toossi, 2007). In Indiana, a new labor report reveals that the increase of non-residential construction will increase to a total gain of 11% over the next three years (Fmi, 2007). A report validated by owner’s projections show that this state as one of the healthiest in the industry. The ACE Mentoring is also expanding to another location in this state. This could lead to yet more university collaboration.

Recommendations

As the construction industry, including architects and engineers, are struggling to increase enrollment to align with the forecasted needs of the industry, the ACE Mentoring program is a way to increase the awareness and assists to connect with a population of students that traditionally go untapped. While expanding awareness in a group that is untapped, the image of the industry is improved by the positive influences of the mentors. Many of the students being mentored in this program do not have family members to show them the way to success. As academic partners, this is the way to connect with industry and the community and make dreams happen. Therefore, the ACE Mentoring Program, based on the experience of Indianapolis offers, several recommendations for future research:

1. To collect data about the ACE Mentoring students as a longitudinal study of success. This data needs to be published in a way to attract attention of professionals.
2. To establish connections with academic partners to further support the successful application process of students.
3. To collaborate with industry and academia to seek further funding for ACE mentoring programs in the area of grants. This may be to cover travel expenses for college students or high school students for the field trips.
4. To continue to disseminate information to industry and academics to improve the overall image of construction.