

The Evolution of a Construction Industry Seminar

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Within the limits of a four year degree it is impossible to cover the vast amount of knowledge that a professional constructor needs. In addition, industry professionals desire to share their hard-won knowledge with students and faculty. Students and faculty also want to share their ambitions and desires with industry stakeholders. These needs and desires can be addressed by creating an environment which promotes interaction among the parties in the context of sharing current construction industry practices. A formalized program, called the Construction Industry Seminar, has evolved within the Construction Management program at Northern Arizona University to achieve this end. This paper provides a history of the seminar's evolution and describes the current practice at Northern Arizona University.

Keywords: Seminar, Construction industry interface, Student interaction, Industry relations.

Introduction

The American Council for Construction Education (ACCE) acknowledges that a four-year (120 semester hour) degree programs cannot offer every course or experience needed for the education of a professional construction manager. (American Council for Construction Education, 2014). Still, there is a need to provide students with more exposure to current practices and to provide opportunities for interaction with industry professionals. Summer internships are a good way to do this, and they should be encouraged, if not required, for all CM students. University Construction Management (CM) programs are looking for other ways to bring critical industry experiences into the curriculum. A specific course that incorporates guest lectures and field trips can be effective, but with large class sizes and remote locations, putting these experiences together can be logistically challenging (Opfer & Shields, 2008). Another approach is to provide extra-curricular evening seminars open to all students that integrate topical presentations with industry recruiting efforts. This paper provides a study of the evolution of one such seminar over the course of more than a decade, concluding with the current practice and recommendations for future study and improvement at Northern Arizona University. The purpose of this paper is to provide information to programs that do not currently have such seminars and to programs that would like to expand or improve their current seminars.

Background

"At the core of an industry organisation(sic)-university relationship is the exchange of knowledge" (Lees & Lees, 2012, p. 1). Industry professionals are interested in sharing their hard-won knowledge with students while faculty and students want to share their ambitions and desires with industry stakeholders. Lees and Lees go on to posit that the divergence in how universities and industry have developed has led to a disconnection between what is learned in an academic setting and what is learned in industry practice. The American Council for Construction Education, one of the primary accrediting boards for CM education, recommends that in addition to institutional requirements, the curriculum "should be responsive to social, economic, and technical developments and should reflect the application of evolving knowledge in construction and in the behavioral and quantitative sciences" (American Council for Construction Education, 2014). ACCE further recommends that students be encouraged to participate in extracurricular activities that complement their academic studies.

Literature on how to connect construction management students with industry professionals has been limited to immersive internships (Adcox, 2000; Meekel & Jenkins, 2013; Wasserman, 2008), mentorship programs like ACE (Koch, 2007) and capstone classes with sponsors (Peterson, 2008; Smith, 2008). Boyd's (2012) work in learning from practice describes a practice that requires students to interface with industry professionals on a technical/theoretical problem in construction materials.

The 2012 National Survey of Student Engagement (NSSE) groups students into ten academic disciplines and shows wide differences in the number of hours these student groups put into schoolwork outside the classroom. Engineering students report spending 25 hours per week on reading and class preparation, while business students report spending 21 hours on the same academic tasks (Indiana University Center for Postsecondary Research, 2013). Business students have reported spending the most time at paying jobs (16 hours/week) while engineering students spend the least (9 hours) (Pérez-Peña, 2011). There was no discipline breakdown for construction management students in the NSSE survey, however, their responses would be expected to fall somewhere between engineering and business majors in their study and work demands. Because college students spend a significant number of hours dedicated to academics, in addition to paid work and family responsibilities, their ability and willingness to engage in extracurricular activities is a very individual decision.

If interaction among construction management students and construction industry professionals is important to the student's development, what are effective and efficient methods for helping students and industry professionals connect in a deep and cooperative way? We believe that the Construction Industry Seminar can fill this need.

History of Contractor Night

Northern Arizona University is a rural university rated "High Research" by the Carnegie Foundation ("Carnegie Foundation Archive," 2014) in a small city of 68,700 (2013, estimated) of whom approximately 20,000 are college students. Northern Arizona University is a two-hour drive to the nearest large metropolitan area where most of its construction industry supporters have operations offices. Given this distance, the faculty has been concerned about maintaining a strong relationship among our students, employers and alumni of the program.

More than a decade ago, the CM program introduced the concept of a "Contractor Night" as an opportunity for construction firms to visit the campus with the express purpose of recruiting CM students. Contractors were given a one-hour open forum prior to presenting a short guest-lecture in an evening senior-level class. All CM students were invited to learn about a particular contractor and were occasionally given the opportunity to interview for summer and full-time positions on the following day.

Contractor Night soon evolved into a part social and part recruiting event in which the contractors would provide pizza in an effort to attract larger audiences and more potential employees. The next step in the evolution was that the short presentations in the senior class became longer and the faculty members began relying on these guest lecturers to support their teaching objectives. These guest lectures began to encroach on the planned curriculum to the point where the faculty were not able to address required topics. In addition, the quality of the presentations was unpredictable and students commented that faculty sometimes did a better job than the professionals at presenting similar topical material.

Meanwhile, the CM program had been reliant on multiple fund-raising efforts to support extracurricular activities and program enhancement. These events were centered on different events such as a golf tournament, the Associated Schools of Construction Student Competition and a graduation banquet. In 2011, the program's industry advisory board (IAB) created a simplified system to streamline fund raising. With a new external funding program coordinated by industry, sponsors agreed to commit to different levels of support, and in return, they received opportunities to participate without charge at the various events. As an added benefit, sponsors would be given one or two reserved Contractor Nights (now called the Construction Industry Seminars) with priority scheduling. This provided commitments to fill more than half of the available time slots throughout the semester. As more sponsors committed to the program, the number of available time slots reduced to the point where today, every available weekly Construction Industry Seminar is committed to CM program sponsors.

As contractors started to present more interesting topics, the amount of time spent on recruiting and company information decreased. In 2012, the faculty decided to formalize contractor night as a once-a-week presentation with a standardized format. The faculty also reorganized the weekly event to separate out a half-hour 'meet & greet'

social time, followed by a one-hour presentation. The faculty worked with the contractors to coordinate topics and to provide advice on making the sessions more dynamic and interactive. In 2013, the name was formally changed to "Construction Industry Seminar" to reflect the educational aspects of the evening. In order to address a flat enrollment rate (subsequently increasing) and to provide a wider exposure to program sponsors, the seminars were advertised to a wide variety of students, including students studying Civil Engineering, Environmental Engineering, Business and Interior Design. The seminar schedule is also posted to the departmental website and distributed to the college dean, engineering program administrators, and campus-wide student advisors.

Current Practice: The Construction Industry Seminar

The Construction Industry Seminar is a way of connecting construction and engineering companies with potential employees. It also provides a way for professionals to share their knowledge and expertise with the students and for the students to share their career ambitions with industry professionals. Seminars are hosted every Thursday evening during the semester, resulting in approximately 25 seminars each academic year. Between thirty and fifty students and multiple faculty and staff typically attend each seminar.

Presenting contractors typically bring one or two representatives, if possible including an employee who is an alumnus of Northern Arizona University. The company position of the lead presenter varies from company to company, but includes vice presidents, executives, HR directors, project managers and site superintendents.

Contractors are given the opportunity to collect resumes and sign up students for interviews the following day. The CM program arranges interview rooms and assistance with logistics to help with the interview process. Some of the visiting contractors allow anyone to sign up for an interview, allowing students, especially first and second year students to experience a real interview and often win a coveted internship. It also allows contractors to scout talent that might not have presented well on a resume. Other contractors take resumes of all interested students, and then review the applicants in the evening, making calls as late as midnight to schedule interviews for the next day. Some contractors solicit these resumes in advance of the seminar, and still others direct students to their company's centralized website to apply.

In order to minimize time conflict with scheduled classes, each seminar starts with a meet & greet social hour in a prominent lobby space at 5:00 pm. The Construction Management Organization (CMO), the student activities group, arranges catering and presents an invoice to the contractor (catering expenses range from $5 to $12 per attendee, depending on the type of food chosen). This service is a vast improvement over the past method in which the contractor made their own arrangements. The improvement resulted in a variety of different meals (as opposed to pizza every week) and liberated the contractor from having to deal with the logistics of ordering and arranging delivery. In exchange for this service, the CMO adds a nominal service fee which helps fund other student events.

From 5:30 – 6:30, the seminar moves to a one-hundred seat auditorium adjacent to a high visibility lobby area for the presentation. The recommended format of the presentation is to have 10-15 minutes for a company profile and hiring information and have the balance dedicated to a current topic that aligns with the contractor's expertise and interests. Based on student comments, we have concluded that the most effective company profile presentations are short (5 minute) professionally produced videos followed by brief comments and a question and answer session. Many contractors move Q&A to the end of the seminar so that they can have individual conversations with students after the formal seminar end time.

Individual CM Faculty members are paired up with sponsors in order to make arrangements and act as a university host. This pairing, a departure from the previous format in which one faculty member was responsible for making all arrangements, has had the benefit of connecting each faculty member with industry representatives while also spreading the work load among the faculty.

The overall scheduling is completed by the CM Program Director at the beginning of fall semester for the entire academic year, with priority scheduling given to higher-tier sponsors of the CM program. Each year the curriculum is reviewed and contractors are queried to identify important construction industry topics. Student feedback is also sought to identify topics that may be of interest to them. From this information a broad list of topics is generated. Presenters select from the list or suggest additional topics for consideration by the program director.

Since 2012, commercial and heavy civil contractors, large general contractors, small construction companies and specialty subcontractors have presented on various topics including:

- Career advice and communication skills
- Virtual Construction and BIM
- Lean Principles and Practices
- Working with Subcontractors
- Project Management
- Case Studies
- Site Logistics
- Heavy Civil Construction
- Preconstruction
- Value Engineering
- Risk Management.

(see Appendix for detailed listing of topics)

We acknowledge that one best teaching practice is to use active learning approaches (Tatum, 2010) and to break presentations up into smaller segments (Weiman, 2007). Because our presenters are rarely professional speakers or trained teachers, we encourage them to avoid the long-winded passively accepted PowerPoint presentations. In our experience, the most successful topical presentations are ones that are interactive and engaging.

Some of the most effective seminars have included an active pull-planning session, a site logistics exercise with students, the Lego airplane Lean simulation, and an estimating activity using K'nex toys. Students also give positive feedback on interesting case studies and presentations that demonstrate how cutting-edge technology is being used on construction sites.

Benefits to Stakeholders

One of the key factors in judging the efficacy of any program is the identification of benefits to the participants or stakeholders. In this case, the stakeholders include the contractors, alumni, students, faculty and the CM program. In assessing the future direction of the Construction Industry Seminar, the following benefits were taken into account:

Contractors

Contractors who support our program become familiar with our students and faculty in a friendly and non - threatening atmosphere. This is a significant recruiting advantage for the contractors as students rarely accept employment with firms that are not familiar to them. Other benefits include:

- Building or cementing relationships with faculty for sharing knowledge and information.
- Providing an opportunity for presenters to hone presentation skills in a friendly environment.

Alumni

Alumni of the program who are employed by supportive contractors can "give back" to their university and degree program without giving money. This is especially helpful to younger alumni who are creating a pattern of university giving. Other benefits include the opportunity to:

- Foster continuing active relationships with alumni employed by contractors.
- Encourage life-long learning through opportunities to teach and share information.

Students

Students are exposed to current topics in the construction industry. This exposure has a positive effect in the classroom as it reassures students that the curriculum is current and relevant. Other benefits include the opportunity to:

- Build relationships with potential employers.
- Observe and model leadership practices of service to industry and community.
- Learn about the industry and become involved (for non-construction students).
- Mingle informally with faculty and build social interaction skills outside the classroom.
- Learn about work expectations from recent graduates.

Faculty

Faculty are exposed to new information about current practice in construction and keep current on industry needs for curriculum development. Other benefits include the opportunity to:

- Build and maintain relationships with industry recruiters and sponsors.
- Be seen by students as respected by industry leaders.
- Seek sponsor support in the growth of the program by recruiting new students.
- Ignite interest in sponsors who may be interested in becoming CM faculty.
- Provide a focused support curriculum that enhances the learning objectives of the program.

CM Programs

CM Programs, and by extension universities, benefit from the relationships developed among contractors, alumni, students and faculty. Beyond the financial benefit granted to the program, the association with prominent contractors can raise the stature of the institution, thus attracting more sponsors and qualified students and more university resources.

CM Industry Advisory Board Review and Recommendations

In order to continuously improve the Construction Industry Seminar, the CM Industry Advisory Board (IAB) curriculum committee was charged with evaluating the seminar. The committee was asked about the format of the seminar, whether the seminar should be streamed, "taped" for future use, and/or whether others in the community should be invited. The IAB curriculum committee held focused interviews with student leaders and distributed a survey to all CM, Engineering and Interior Design majors.

While their final report is forthcoming, their preliminary evaluation is:

- Students like hands-on presentations, especially to be broken into groups and engaged in some exercise rather than listening to a lecture-type presentation.
- Timing – 2 hours allotted is better than 1 hour; but never exceed 2 hours.
- Live stream is not recommended. Better to get the students to the classroom to interact with the contractors.
- CM department should coordinate subject matter with contractors to ensure that several don't present the same subject within a given time period.
- From a scheduling perspective, some CM students may not be able to attend, however, no recommendation to change the current schedule.
- Contractors should allow time for Q&A during and after their presentations.

The student survey results can only be considered preliminary at this time. These results indicates that 53% of respondents attend every week. Those who do not attend cite schedule conflicts as the major reason. Contrary to IAB recommendation, 61% of students would prefer to keep the seminar to a one-hour presentation. Students

respond that the best aspects of the seminar include networking with professionals and learning directly from those professionals. They confirm that interactive presentations are the best, and suggest having more as a way to improve the seminar. Students respond that the seminars have improved over the last few years. They voice concern that, if they cannot attend, they are missing out on opportunities to get interviews. For this reason, they suggest providing a way for students to sign up for interviews apart from attending the seminar. Regarding topics, students request a greater range of topics, including more on heavy civil projects and processes.

Future Direction

Based on our observations, preliminary recommendations of the IAB curriculum committee and responses from students, we intend to make the following adjustments to the Construction Industry Seminar:

1. Provide more directed training for presenters to help them make sessions more interactive.
2. Offer the seminars to local contractors, architects and engineers.
3. Offer the seminars to university facility employees as required training opportunities.
4. Improve and motivate attendance by:
    a. Developing a student attendee recognition program.
    b. Reward attendance by providing credit opportunities in classes.
    c. Seeking to identify the usefulness of seminar individual topics and presentations.
5. Integrate the Construction Industry Seminar with our LinkedIn sites, and other social media.
6. Seek additional ways to connect students with industry professionals in a holistic way.
7. Use industry knowledge to help with developing our formal curriculum.

The authors plan to expand their work by surveying Associated Schools of Construction faculty and program leaders in an effort to determine the extent of current practice and to establish best practice in this evolving area of student-industry interaction.

Conclusion

The purpose of this paper was to provide information to programs that do not currently have such a program and to those program leaders who would like to expand or improve their processes for current industry seminars. The authors have laid out a process evolution for a specific university and hope that other programs can improve their processes by understanding how the program evolved at Northern Arizona University. The Construction Industry seminar has proven to be both an effective and efficient way to promote industry professionals sharing their knowledge with students and to provide a way for students and faculty to directly interact with these professionals. What started as a casual way to enhance a lecture and build individual relationships has evolved into a formal program that significantly exceeds the original expectations. In the near future the program stakeholders are committed to a full survey process and to continuous process improvement for the Construction Industry Seminar.

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Appendix: Seminar Topics 2012-2014

Career and general skills advice

Resume and Interviewing Workshop Interview and career fair prep

Managing your Career

What I would have liked to know before I got into construction.

Presentations /communication

Virtual Construction

Building Information Modeling BIM demonstration - Hospital coordination

Using BIM (Autodesk 360 Field) for QA/QC on a jobsite

How technology is helping transform how construction projects are visualized and built

Lean Principles

Lean Primer

Lean Airplane Activity

Prefabricated construction trends & current practices

Scheduling using Pull-Planning Sessions

Working with Subcontractors

Working with Electrical subs.

Subcontractor issue resolution

Coordinating MEP

Trade coordination.

Specialty Contracting

Project Management

Bonding for Contractors from both a Bonding Agent and Contractor perspective.

Managing Solar Energy Construction

Quality Control on Large Infrastructure Projects

"Pod" scheduling

Motivating and Managing Field Personnel

Case Studies

CAP - emergency fix

Interior Fit Up

Baseball Stadiums

Constructing Data Centers

ADC 500 Lewis Prison Expansion project

Site Logistics

Science and Health Building, NAU Campus

Project Planning & Site Logistics

Heavy Civil Construction

Using K'nex to demonstrate estimating

Highway Construction Work

Take off of Concrete and reinforcing for a culvert on a Heavy Civil project

Mining Operations

Preconstruction

Preconstruction for Hospitals

GC's Role in Preconstruction

Miscellaneous

Value Engineering: Exercise on VE for a wall construction

Risk Management for Contractors

Building Codes