

Engaging Practitioners in the Development and Delivery of Demolition Courses

Kevin R. Behling, MSCE and Mark Shaurette, MSCE
Purdue University
West Lafayette, Indiana

Whenever an instructor teaches a course for the first time, there is a learning curve. Having a textbook, syllabus and notes from a prior course offering can flatten the curve dramatically. What if the course has never been taught before and there is not a suitable book available on the topic? If the instructor has some relevant industry experience, he or she can assemble a syllabus and identify reading materials in journals, industry publications and internet sources. However, what if the instructor does not have relevant industry experience and there is no book? This paper details how two construction management instructors have coped with teaching what may be the first structural demolition-related courses offered at the university level. In order to overcome their own lack of experience and the absence of a textbook, they engaged the knowledge of members of the National Demolition Association. While it was tempting to utilize guest speakers in the majority of lectures, the instructors used the practitioners sparingly but effectively through careful guidance of guest speakers' subject matter and coordination with course goals and objectives. This paper contains guidance on the use of guest speakers that will be helpful to instructors of all construction-related subjects.

Keywords: Guest Speaker, Lesson Planning, Course Planning, Demolition

Introduction

Purdue University's Department of Building Construction Management has committed to develop a specialization in demolition and reconstruction. Because this effort is the first college-level attempt at demolition coursework, there are several challenges that must be overcome in the development of this specialization. The primary impediment is the lack of a textbook or professional handbook. A secondary, but nonetheless significant issue is the limited demolition-related experience of the instructors. Fortunately, Purdue University is not "going it alone" in the development of this specialization. The National Demolition Association (NDA) is offering the expertise of its board of directors to the instructors through syllabus critiques, guest speaker appearances, jobsite photography visits and virtual field trips. In the near future, the assistance of NDA will expand to physical field trips and textbook development. The successful engagement of demolition practitioners will be a key component in the development of a demolition and reconstruction specialization at Purdue University.

Practitioners to Aid Teaching

Educational collaborations with practitioners can provide benefits to both students and faculty. Students can obtain an insight into current issues at the applied and practical level that would not otherwise be available to them. In addition, student exposure to guest speakers can provide opportunities for summer and permanent job placement which also helps to fulfill recruiting

goals for the practitioner. Involvement with practitioners can also lead to other forms of collaboration with faculty such as curriculum enhancements, identification of potential research direction, and joint educational or research opportunities (Beckman, Coulter & Khajenoori, 1997). Tener (1996) suggests that design and continuous updating of the construction engineering curriculum is a fundamental function that requires the university to collaborate with industry practitioners. He further states that highly effective engineering education is influenced favorably by guest instruction from practicing constructors.

Construction management programs frequently make room within the curriculum for guest speakers to enhance lessons with practical field knowledge. The United States Air Force Academy combines hands-on course activities with field trips and guest speakers to enhance understanding of construction capabilities, challenges, and limitations (Kuennen & Pocock, 2003). Guest speakers are also useful for exposing students to new technologies and construction procedures. When these new concepts are presented by practitioners using complex or new terminology, graphs, and figures student understanding can be limited. Rose (2002) describes a group of students who attended a guest presentation about a project involving installation of rock anchors by a speaker from the U.S. Army Corps of Engineers. Only 41% of the students attending could recall anything innovative about the project described in the presentation. In addition, 88% indicated that a lecture in class would have helped the students understand what the speaker was talking about.

Some take a more negative view of industry's influence on education. In her book *University, Inc.* Jennifer Washburn (2005) describes repeated instances where influence from industry (and corporate contributions) is suspected as the cause of questionable decisions by universities or even manipulated research results. Although many of her allegations are circumstantial, she does make a substantial case that money influences what is taught in many situations. In a recent example, IBM has helped to develop curriculum and has awarded grants to North Carolina State University with the goal of providing students a better background for employment with IBM (Chaker, 2006). Is this a breach of academic integrity and independence, or merely an instance that requires faculty to realign their teaching activities to suit the emerging job market? Clearly it is a situation where those involved must be cognizant of the need to develop a curriculum that is broad enough to suit a range of potential employers for their students.

In the experience of the authors, it is necessary to take into account the potential for conflicts of interest when engaging practitioners in the educational process. In addition to possible differences in viewpoint on expected outcomes, there may be misunderstandings about content as well as the potential for bias. The authors believe that these issues may be resolved by addressing the following questions: Is the goal to give students a well-rounded understanding of the industry as well as the processes and procedures they would be expected to encounter when entering the workforce? Or, is the goal to provide students with a set of specific skills that industry purports to require of new graduates? Do students need to know why things are done or do they simply need to know how to do them? For example, are environmental or safety regulations as enforced a costly imposition on the contractor or are they government's exercise of judgment to protect workers and the public? The answers to questions like these are best explored in an open dialogue between faculty and practitioners while collaborating on the educational process. Those involved in the educational collaboration should keep in mind that a

faculty member is as likely as an industry practitioner to harbor biases that can influence the teaching process.

Implementation in Demolition Courses

After the determination of a course title and description, the first major step in developing a course is the generation of a syllabus and lecture calendar. When there is no textbook available, the instructor has limited guidance in developing a list of lecture topics. The second author of this paper was the first to teach a course related to demolition which was entitled “Introduction to Demolition and Reconstruction.” This course was three credits and was offered successfully three semesters in a row in a single-section, twice-a-week, 75-minute format. He relied upon two techniques to write a syllabus. The first tool he used was to attend NDA board meetings and annual conventions to learn about the issues facing the demolition industry, to cultivate practitioner contacts and to observe machinery exhibited at the annual convention’s trade show. He also focused on the idea that a demolition-related course should highlight topical areas that are different between demolition and new construction. The first substantive use of demolition practitioners was to review and critique the lecture topics portion of the syllabus. Through this process, the content of the course was not only refined, but opportunities and “fits” were identified for guest speaker slots. This process occurred over a period of two years with the course being offered for the first time in the fall semester of 2005.

Another substantial benefit from engaging the NDA was access to jobsites to obtain photographs that could be used in the classroom to illustrate key demolition concepts. Several of the NDA members offered their projects to be photographed. In most cases, obtaining permission from the owner, general contractor or construction manager was not a problem. When the educational nature of the visit was explained, most parties were more than cooperative. The first author of this paper utilized this opportunity during the summer of 2006 in order to develop the second demolition-related course, “Heavy Equipment for Demolition and Construction.” This course is also three credits and has been offered twice as a single-session course: once in a twice-a-week, 75-minute format and once in a three-times-per-week, 50-minute format. While the twice-a-week format worked well for the introductory course, the second course works better in a three-times-per-week format due to the focus on particular types of equipment. One project was visited by the equipment class via the internet using wireless webcam technology for a virtual class field trip. The students were able to see and hear the activities on the site, hear commentary from the site supervisor and ask questions of the site supervisor.

One potential issue when employing a guest speaker is deviation from the objectives of the lecture. To mitigate this potential problem, the instructors took a proactive approach to controlling the content of the guest lecture. After the lecture calendar was developed, guest speaker “fits” were identified. By establishing a lecture calendar first and then identifying guest speakers, the practitioners integrated “seamlessly” into the course with a minimum of coordination required before and after their contribution. The first step in this process was to write a one-page outline for the guest lecturer (refer to Appendix 1 at the end of this paper). These outlines were first reviewed by the chair of the NDA’s education committee. After appropriate adjustments were made to the outline, a copy was sent to the guest lecturer who was

primarily responsible for developing the lecture. In most cases, first-time guest speakers were encouraged to come to campus several hours before they spoke so that the instructor could sit down with them and review their lecture materials to ensure that educational objectives would be met. If necessary, adjustments were made to the lecture. It was also helpful to get the speaker acquainted with the classroom and other aspects of the department before they gave their lecture.

The instructors also actively attended the guest speaker lectures and asked questions that stimulated student interest and encouraged further questions. Attendance of the instructor during the guest lecture helped to ensure that the lecturer stayed on topic and avoided digressing into a series of “war stories” that lacked applicability to the lecture’s subject. While “war stories” tend to hold the attention of the students, it is not uncommon for these tales to get off topic and thereby deviate from the pedagogical objectives. However, guest speakers were encouraged to use “real world” examples to illustrate and reinforce their main points. The use of relevant “war stories” as “real world” examples often is an effective tool to underscore concepts. In the opinion of the authors, use of a guest speaker should not be grounds for the instructor “taking the day off.” The instructor needs to spend just as much time preparing for a guest speaker presentation as he or she would for their own lecture.

One immediate benefit that accrued to the authors through the use of industry practitioners as guest speakers was an expanded knowledge of demolition operations. Interaction with practitioners through the planning process inculcated a curiosity to delve deeper into subject matter. These planning interactions provided further opportunity to question and probe for understanding. An advantage to having limited demolition industry experience is the ability to ask the most basic of questions. Unfortunately, in some situations the authors’ inexperience in demolition left them ignorant of their lack of knowledge. By exposing this lack of experience, the guest lectures themselves were beneficial to the authors. Although some guest speakers were shared between the two classes, not all speakers spoke to both classes. Whenever their schedules permitted it, both authors attended all guest lectures to show support for the efforts of the practitioners that offered their assistance. By doing so they also expanded their knowledge of the demolition industry.

Guest Speaker Examples

Good guest speakers come from many backgrounds. An example used by one of the authors is a speaker who was not from the demolition industry and who was rather early in his career. This individual was chosen to speak because of his previous employment with OSHA. He had recently joined a major construction company as a safety officer. The topics he was asked to address were safety procedures and what students could expect in their effort to comply with government safety regulations. His initial presentation was factual, covered the specifics of safety, and provided some insight into the workings of both OSHA and EPA enforcement procedures. In subsequent presentations, his delivery and effectiveness improved. He deftly wove the factual information into his presentation by using photos of several projects on which he was working. Each of these projects involved selective demolition and reconstruction activity. By using the context of the job-specific information he was able to make the subjects of safety and regulatory compliance real to the students. His background in regulatory enforcement,

general contractor's perspective, and relative inexperience with demolition were all factors that the students were able to relate to as indicated by the number of questions he received during and after the presentation.

Many industry practitioners are not accomplished public speakers. Unfortunately one-on-one interaction is not always a useful guide in discerning who may or may not be good at holding students' attention as a guest speaker. The authors experienced one such example with an early demolition guest speaker. As a long-time demolition company owner, this speaker possessed a wealth of knowledge and experience, had been an active participant in the governing body of the NDA, and spoke well in front of any group of his peers. Unfortunately, his lack of confidence as a public speaker led to a surprise on his first visit as a guest lecturer. His presentation was meticulously prepared, which he proceeded to read word-for-word to the class. As would be expected this presentation, packed with information and words of wisdom, failed to hold the attention of the class. By the end of the presentation this speaker realized the shortcomings of reading a prepared monologue. His enthusiasm for the subject caused him to request a second chance, which was granted with some trepidation. Fortunately, the next semester this speaker returned with greater comfort in front of the group of students. He proceeded to speak with only a few notes and a group of jobsite photos. On this occasion he may not have emphasized every point he intended, but the points that he made were heard with attention by the students.

Suggestions for Educational Use of Practitioners

When incorporating practitioner presentations into course delivery, the authors have found it beneficial to partner with an industry association. By doing so, the demolition and reconstruction courses have benefited from the collective wisdom of several dozen demolition companies. For example, the initial lecture calendars for each course were first discussed with the NDA education committee. After making modifications suggested by the committee, the calendars were presented to the NDA board. Once the calendars were finalized, discussions were held to determine which topics would benefit the most from the utilization of a guest speaker. Lastly, guest speakers from a broad range of companies were recruited to speak. In the equipment course, speakers from Los Angeles, Boston, Peoria, Tulsa, Houston and Chicago addressed the class in its first semester. Therefore, the students heard from a wide variety of viewpoints that reflected various geographical region, work specialty and company size perspectives.

The authors are very fortunate that the NDA has not only sponsored their attendance at board meetings and conventions, but has also underwritten the expenses of the guest speakers and the cost of the first two years of the demolition and reconstruction program at Purdue University. Therefore, it is further suggested that dovetailing a guest speaker program with industry sponsorship yields a sum greater than its parts because the practitioners have a financial stake in the success of the program and therefore are more likely to invest time in the individual classes in which they are participating. On the other hand, it is possible that the sponsorship may not last indefinitely, so it is crucial for the instructor to learn actively as much as possible from each guest speaker.

Direct partnership and sponsorship are beneficial, but not necessary for the successful engagement of practitioners. However, it is important that the instructor put just as much effort into preparing for a guest lecturer appearance as for a “regular” lecture. In their experiences as students, the authors too often witnessed the “guest speaker as fill-in” approach to practitioner engagement. More often than not, the instructor of record was not present during the guest speaker’s presentation. It is the opinion of the authors that this approach suggests to the students that the subject of the lecture is less important than a “regular” lecture. In many instances, the guest speaker is merely given a “topic” to speak about with little or no detailed direction provided. In the worst cases, the guest speaker presentation is little more than an advertisement for the speaker’s company or product. Students will get more out of a guest speaker’s presentation when their instructor invests in the preparation of the presentation.

Classroom discussion of the topics being covered by a guest speaker in advance of the guest lecture is useful in improving the students’ interest in the subject and can increase the likelihood of interaction and questions (Rose, 2002). Active learning exercises and assignments can also be used to prepare students prior to the lecture. These exercises can provide students with specific questions or concepts and topics to explore through interaction with the guest speaker (Richardson & Glosenger, 2006; Silberman, 1996). Subsequent to the guest lecture the topics covered should also be the subject of discussion. Often specific points of emphasis, although mentioned by the speaker, did not receive adequate coverage and required reinforcement and review. On other occasions discussion was required to bring another point of view to the subject. As mentioned previously, biases of many types are prevalent in industry as well as in the academy. It is helpful to bring these biases to the attention of students. Doing so will not only make them aware of the issues and different points of view, but will help them to think about and form opinions of their own.

Properly preparing for a guest speaker’s appearance is straightforward. The first step is to establish a topic and educational objectives for the guest lecture. It is crucial that this information is communicated to the guest speaker at the time they volunteer. If the speaker’s industry experience or expertise is not a good fit for the topic, it is possible to modify the objectives or to assign the volunteer to another topic. If an industry practitioner is willing to take time out of his or her schedule and travel to campus, it only makes sense to align pedagogical objectives and practitioner expertise. After alignment of speaker and topic is ensured, the next step is to prepare an outline of the lecture content for the speaker. This approach is the only way that the instructor can be assured that the lectures both leading up to and following the guest speaker are coordinated appropriately. Communication with the practitioner is a key to success. For maximum effectiveness, this communication should occur both before and after the presentation. Rose (2002) suggests that part of the “before” communication should include information regarding the class and students that will help the speaker to understand at what level his or her talk should be. The authors typically provided feedback to the guest speaker immediately following the lecture since they were there to witness it and in a written “thank you” note within a day or so of the presentation.

Conclusion

Engaging practitioners in the delivery of a course is an opportunity to incorporate “real world” wisdom and experience into the course. In the opinion of the authors, instructors of record should not view the guest lecture as a “day off.” When attempting to develop a series of courses on a subject not previously taught at the college level such as demolition, the incorporation of industry practitioners, on a limited basis, into the lecture calendar can provide benefits to the students, the instructor, and even to the professional. For maximum effectiveness, the instructor must engage (not merely employ) the practitioner to be an integral element of the course even if it is only for one class period. This integration can only occur when the instructor actively participates in the selection of topic, identification of learning objectives, and development of lecture content. It is also crucial to provide timely and constructive feedback to the practitioner. Whether one is teaching something new to the academy or something that has been taught “forever,” appropriate engagement of practitioners in the delivery of a course can be beneficial to everyone involved.

References

- Beckman, K., Coulter, N., & Khajenoori, S. (1997). Collaborations: closing the industry-academia gap. *IEEE Software*, 14(6), 49-57.
- Chaker, A.M. (2006, September 12). Majoring in IBM. *The Wall Street Journal*, pp. D1-D2.
- Kuennen S.T., & Pocock, J.B. (2003). Bringing construction experience into the classroom. *Construction Research 2003, ASCE Conference Proceedings*, 120(56).
- Richardson K., & Glosenger F. (2006). Strategies to enhance video use in the college classroom. *The Teaching Professor*, 20(7), 1. Retrieved August 23, 2006 from http://www.magnapubs.com/issues/magnapubs_tp/20_7/news/599127-1.html
- Rose, A.T. (2002, June). Exposing students to innovative construction technologies in the undergraduate civil engineering technology curriculum. *Proceedings of the 2002 American Society for Engineering Education Annual Conference & Exposition*. ASEE, Montreal, Quebec, Canada, June 2002.
- Silberman, M.L. (1996). *Active Learning: 101 strategies to teach any subject*. Boston, MA: Allyn and Bacon.
- Tener, R.K. (1996). Industry-university partnerships for construction engineering education. *Journal of Professional Issues in Engineering Education and Practice*, 122(4), 156-162.
- Washburn, J. (2005). *University, Inc.*, New York, NY: Basic Books

Appendix 1: Example Guest Lecture Outline

Suggested Outline for *****

Thursday, October 12, 2006

Course: BCM 499E - Heavy Equipment for Demolition and Construction

Topic: Salvage, Recycling and Disposal

Introduction

Who is *****?

How many years experience with demolition?

What company is he with?

How long has the company been involved with demolition?

Where is the company located?

How has salvage, recycling and disposal evolved during his career?

What forces have impacted salvage, recycling and disposal?

Regulatory

Contractual (includes Owners who want "good will" with public)

Economic

In general,

How does one determine what to salvage or recycle?

Regulatory and/or Contractual Compliance

Economic "Common Sense"

Schedule Constraints

Jobsite Conditions

When estimating, how does one determine how to account for

Salvage Value? – Must find a "Customer"

Recycling Value? – Play the Commodities Market

Disposal Costs? – Tonnage / Yardage Charge & Trucking

How does recycling and salvaging affect labor productivity?

How does recycling and salvaging affect equipment selection?

How do hazardous materials affect the "disposal" question?

Equipment for Salvaging

Saws / Torches / Hand Tools (handwork to separate items to be salvaged)

Cranes / Fork Trucks / Loaders (to carefully remove items to be salvaged)

Millwrights (not equipment, but necessary to remove certain machinery)

Containers and Trucks

Equipment for Recycling

Excavators

Processors

Magnets

Concrete Crushers

Loaders

Containers and Trucks

Equipment for Disposal

See Above

Questions?

Author Notes

Kevin R. Behling is an assistant professor in the Department of Building Construction Management in Purdue University's College of Technology and has been charged with developing a degree specialization in Demolition and Reconstruction Management. He is also a Ph.D. candidate in Civil Engineering at Iowa State University.

Mark Shaurette is a Ph.D. candidate in Purdue University's College of Technology, concentrating on reconstruction and demolition with a cognate specialty in education. Mr. Shaurette has served as an instructor in Building Construction Management since fall of 2002 and recently developed and taught Introduction to Demolition and Reconstruction Management.

For additional information contact Kevin R. Behling at kbehling@purdue.edu.