

Assessment of an Online Field Supervisor Training Program

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Collaborations with industry and academia are an important part of successful Construction Management (CM) programs. Academic professionals are qualified and articulate in training for industry, but there is a need to provide assessment of the training to show value to industry, understand impact of training, and provide data to improve future sessions. One model that has been used is a quantitative pre-test and post-test with a qualitative interview technique. Supervisors who took the course were interviewed for reactions to ascertain if work was improved in the field because of the knowledge acquired through the training. This paper will outline methods used to assess the online training programs and how this information has been used for improvement.

Key Words: supervisory training, training assessment, online learning, distance learning

Introduction

For the past three years, the Department of Building Construction Management (BCM) at Purdue University has offered an online certificate program for field personnel. Lessons learned through evaluation of the attendees and their supervisors have revealed the beneficial impact of the training and have given BCM faculty information for the continual improvement of the program. The online training was developed to offer a more industry-friendly and less expensive training option. Eliminating the necessity of travel for class participants has allowed a better attendance rate and decreased overall cost for the contractor. But, there are those who do not believe that online training is effective. It was necessary to provide an assessment tool that would provide feedback at multiple levels. The following will outline the model that has been implemented to assess the online training conducted by BCM faculty. It will outline the development of online training, the technology utilized to deliver the course, assessment methodology, and the corresponding results and conclusions.

Online Training

Distance training is not a new concept. Distance education has evolved from the correspondence courses of the 19th century, to live television courses, to the online interactive web-based versions available today (Monolescu, Schifter, & Greenwood, 2004). The first full online learning course was complete in 1981 (Harasim, 2000). Since then, distance learning has expanded in all areas of higher education to create additional learning opportunities for students (Allen & Seaman, 2007). Research shows there are minimal differences in the effectiveness of online learning as compared to the brick and mortar / face-to-face traditional methods of teaching. In fact, research has demonstrated that online-learning actually enhances student learning (Brewer, DeJonge, & Stout, 2001, & Hoffmann, 2002). Research has also shown that in order to be successful, the online program must meet three major needs: convenience, access, and flexibility (Devi, 2001; Ryan, 2001). One of the challenges of online learning is retaining the student; research has also shown that the dropout rate remains high (Connolly, MacArthur, Stansfield, & McLellan, 2007; Levy, 2007). It was found that in the construction industry, most online training programs are related to safety training. This type of training is defined by the standards of the Occupational Safety and Healthcare Administration (OSHA) and strict requirements must be followed for successful course completion. This type of training is often required by a client and therefore, student retainage is not an issue.

It was important for the developers of the BCM online training program that the course content was relevant for students and that their employers were going to be satisfied with the outcomes learned. Research was conducted by the developers focused on the review of existing online training programs (Koch, Benhart, & Jenkins, 2012). While specific content and assessment information specific to field supervisor training programs online was not found during this research, it did uncover different types of training methods. The four major categories for online courses were considered for course development: (a) self-paced, independent study, (b) asynchronous learning, (c) synchronous learning, and (d) a combination of online and in-person learning (Bocchi, Eastman, & Swift, 2004). Table 1 outlines the relationship of each instructional method with time, location and interaction:

Table 1: Instruction Methods Comparison

Instructional Method	Location	Time	Interaction
Traditional Learning	Faculty and Student in same place	Meet at same time	One-on-one and group interaction
Self-paced, independent study	Faculty and Student not in same place	Meet only as necessary	One-on-one interaction with teacher as necessary
Asynchronous Learning	Faculty and Student not in same place	Interact at different times	One-on-one interaction with teacher as necessary
Synchronous Learning	Faculty and Student not in same place	Meet at same time	One-on-one and group interaction

Traditional supervisor training requires field personal to leave the jobsite and leave someone else in-charge to supervise work operations, leading to potential lost productivity. The additional cost of travel and supervision issues sometimes exceeds the return-on -investment of the training. An online training program provides the ability to complete course requirements with minimal interference with job duties and eliminates the need for travel. In order to cut the costs related to travel and employee lost time on the jobsite, it was decided that the program needed to provide distance learning options (Koch, Benhart, & Jenkins, 2013). Adobe Connect Professional software was used as the platform to conduct the online course. A screen shot of the Adobe Connect Professional software is shown in Figure 1.



Figure 1: Adobe Connect Screen Shot

The Adobe Connect Professional software tool as shown in Figure 1 was chosen for the following reasons:

- Real time interaction between faculty and class participants
- Interaction between all or part of the class participants
- No travel to physical location of class
- Breakout groups for small group discussions
- Polling ability to ask questions and display real time results
- Team presentations where team members are at different locations
- Ability to record course discussions lectures/ chat for review at later time or in case of missed class

Teaching Tools

As early as 1916, curriculum theorists such as Dewey believed that interaction was the defining moment of a student transforming knowledge into personal application and value (Dewey, 1916). The internet allows for this interaction to be accomplished in different methods. Figure 2 shows the relationship between interaction and the independence of time and distance (Anderson, 2004).

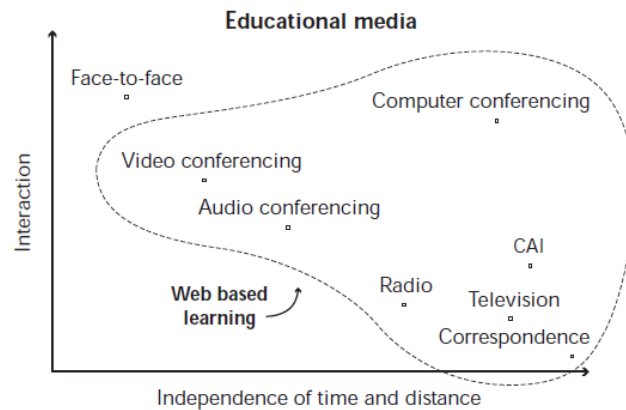


Figure 2: Relationship of Education Median with Interaction and Time & Distance

Adobe Connect Professional is used for real-time meetings and seminars enriched with interactive presentations and discussion capabilities. It combines existing learning content with real-time interactivity between presenters and students for engaging collaborative teaching and learning experiences. Microsoft PowerPoint slides can be used to deliver more effective professional presentations in real time through the use of live and recorded video, Adobe Flash animations, live screen-sharing, audio, and two-way text chat. These presentations are aided by the use of Adobe Presenter, which is a plug-in fully integrated with Microsoft PowerPoint. With the Presenter plug-in, dynamic presentations can be created with narrated, media-rich presentations to enhance training courses directly from within PowerPoint.

Program & Instructor Overview

The program is 10 modules each taking place once a week for 2.5 hours. The program has been offered 5 times. One of which was taken on the road to an ENR top 10 contractor for the exclusive participation by their field supervisors. It is asynchronous and all students participate via headset, microphone, and web cam. The typical participant is a trade-based worker who is managing the work of others and has recently become “management”. Participants come from both specialty contractors and general contractors. They are no longer working with their tools. Most of the participants have been issued their own laptops and have basic computer knowledge. Class sizes have ranged from 10 to 32 participants.

In addition to the past participants and their companies, the program has received interest from several trade organizations. The team was asked to share their success with several large general contractor training directors. Much of the interest lies around the ability to deliver training remotely to trade based workers. The upcoming labor shortage is causing many companies to rethink their training delivery methods.

There are three faculty members who teach and are involved with this program. One faculty has extensive field experience with military contractors and has also worked for Purdue University providing inspections and quality control on campus construction projects. Another faculty grew up in the MEP industry and was the owner of a commercial specialty contractor who worked both domestically and internationally. The third faculty was an officer of an ENR Top 50 contractor and recently came to academia after an extensive career in both the office and the field. All instructors have extensive industry training backgrounds.

On-line Savings

Calculations indicate that the average savings of delivering this course on-line is approximately \$250 a session with a total of \$2,250 in savings per participant (9 sessions). The ability to take the course from home, office, or jobsite eliminates the travel expenses to and from the main office. On average each participant would travel 60 miles round trip to get to their training facility. Many were in congested metropolitan areas that would require extra time to deal with the unknowns of city traffic. The average travel time saved to and from the main office is three hours. At \$75 (typical marked up superintendent rate) 3 hours of travel is lost productivity of \$225. Combined with standard mileage expenses, the total exceeds \$250. More importantly than the financial savings above, the on-line component allowed participants who might not even consider the training because of job site responsibilities.

Assessment Methods

The students in the certificate program begin with a self-efficacy and knowledge based pretest on the first day of class. A coding system is used to connect the pre and post survey questions while still being anonymous. Table 2 shows a sample of the types of questions which are given for the pre and posttest. This is a sampling of the questions and answers that have been utilized for the past three years. Different questions have been developed due to the comments from past attendees of the program.

Table 2: Sample Self Efficacy Questions

	Not at all confident	Reasonably confident	Totally confident
	1 2 3	4 5 6 7	8 9 10
I can always manage to solve difficult problems	1 2 3	4 5 6 7	8 9 10
I understand the way that my company organizes project controls	1 2 3	4 5 6 7	8 9 10
I feel I understand the best communication practices	1 2 3	4 5 6 7	8 9 10
I can solve problems related to field employees	1 2 3	4 5 6 7	8 9 10

The knowledge test is to align with technical content of the training. Samples of multiple choice questions which were used include:

1. Subcontractors are normally selected by _____.
2. Which of the following costs are the most unpredictable?
3. Cost control is _____?
4. Which of the following is not a source of a contractor's actual cost information?
5. The estimate can be used to compare with _____ costs.

Informal interviews with supervisors, who have sent employees to this training, were also completed.

Post-Program Survey Results

Post program results reflected a number of positive changes. Figure 2 shows that there were positive changes in the knowledge of all areas except cost and documentation. It appears that the cost area is one which field supervisors do not always comprehend because they do not measure work in dollars, but rather in man hours. This lesson is good for upper management to understand how to better communicate with the field. One of the major outcomes exposed from the training are areas where management and field are disconnected. Because the facilitators are not part of the management team of the employing company, students feel more open to discuss issues which might otherwise be left alone.

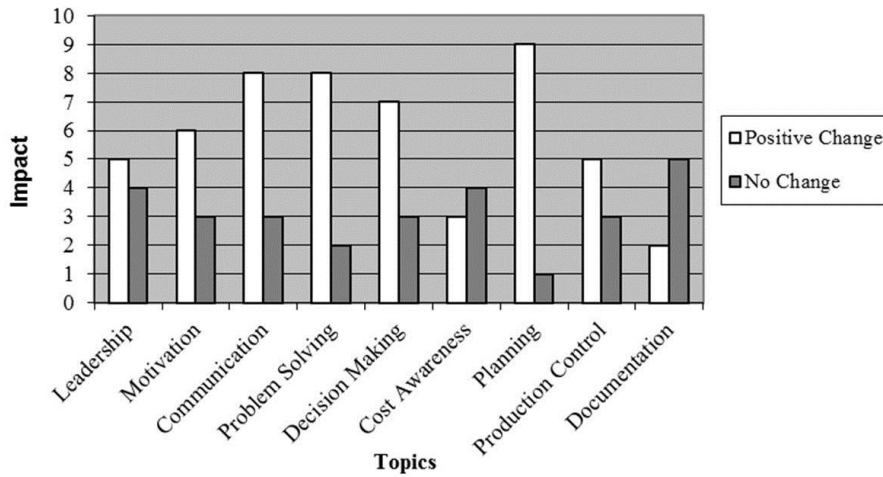


Figure 2: Sample results of knowledge based outcomes

The levels of most of the confidence areas aligned. There was not as much confidence in the cost and the documentation. Figure 3 shows the percentage of positive change in confidence.

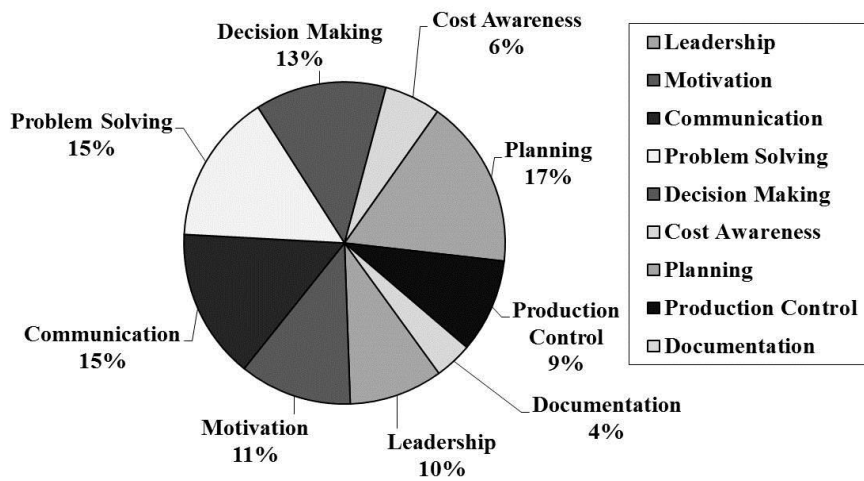


Figure 3: Sample results of confidence change percentage of positive change

When the post-evaluation was administered, course evaluations were given to both the participants and their company sponsors. The following includes selected comments from those evaluations.

Responses from supervisors included:

- “It has already paid off by documentation completed on a project”
- “The return on investment is immediate. They understand the “big” picture of field supervision”

Responses from participants:

- “I have made decisions that have saved my company more money than the cost of the training”
- “I used the communication skills last week and got a better response than yelling”
- “I applied some ideas I learned from others in my class to solve a problem”

Conclusions

This is a simple model for implementing an affordable field supervisor training program. It not only has flexibility to align with the needs of the construction industry, but also retains the rigor of academic standards with high level faculty. The Adobe Connect Professional technology is easy to learn for instructors and for participants. The different levels of evaluation have validated some of the areas that are taught in the course. Improvements include more interaction with each other and more samples of participant work shared with others. There have been a wide range of attendees from very specialized contractors to large general contractors. The program should be taken into consideration for other programs needing to accommodate industry training at any level.

The testing and evaluation of this program reinforce that training can be delivered on a distance platform and attain increases in participant knowledge and confidence. Many of the participants were novice computer users. They were able to adapt and quickly take advantage of the software. Further research will include comparisons between in-person training and distance training for field supervisors.

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