AC 2012-4595: HOW INDIVIDUALS LEARN FALL PROTECTION

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How Individuals Learn Fall Protection

Abstract
To effectively train construction personnel in construction safety means and methods it must be determined from whom employees learn and how knowledge is most effectively transferred to employees. One component in determining from whom and how knowledge is most effectively transferred to employees is to gauge how employees perceive the effectiveness of training. The primary goals of this research were to assess employee's perceptions of the effectiveness of training by first assessing the types and methods of training that they are provided, and then to assess their perception of the effectiveness of that training. Towards this end, a survey was conducted to collect data concerning the perceived effectiveness of fall protection training from employees of small commercial construction entities. The resulting data was analyzed to gauge employees perceived effectiveness of training methodologies and to gauge from whom employees perceive training to be most effective. Findings from the study are relevant because understanding employee perceptions of the effectiveness of training will allow for more effective training methodologies to be developed. Further, understanding training effectiveness is important for construction management students that will eventually be expected to provide training for industry employees.

Introduction

The Occupational Safety and Health Administration (OSHA) mandates under the rules of OSHA regulation 1926.503 that employees exposed to potential fall hazards receive training in the use of personal protective equipment and safety practices as part of its regulations governing construction work. Employers are required to develop and maintain fall protection plans and educate employees of the content of those plans. Training programs must include instructing employees on how to recognize and mitigate potential fall hazards using appropriate fall arrest systems and techniques[1]. However, little detail is given as to the qualifications of the fall protection trainer or to the process by which the fall protection training is conducted.

Specific qualifications of fall protection trainers are not detailed in OSHA regulations other than the requirement that the trainer be competent. It is assumed that this competency is in terms of fall protection knowledge rather than competency as a trainer. This lack of specificity does little to ensure that fall protection trainers are qualified to effectively transfer fall protection knowledge from one person to another. To be competent in the training process the training instructor must be knowledgeable and well prepared for the training, as well as be motivated and energized about the subject. It is also important that the trainer stresses the value of the training to the employees and present the information in a non-threatening manner[2]. Most importantly, in addition to being a subject matter expert, the trainer must be perceived by the learners as a subject matter expert to effectively deliver instructions that facilitate the learning process[3]. Determining effective safety trainers within an organization and ensuring that they have the correct safety knowledge can significantly improve the safety knowledge of all employees within the organization.

Training is a learning process tied to specific situational results, and the focus is usually based on improving individual and/or group behavior and performance. The performance of an employee is improved by showing the learner how to master a new task or job[4]. Two approaches most companies use for training are the reactive approach and the proactive approach. The reactive approach is used as a vehicle to solve problems, with the focus on the performance of personnel and the results of the organization. The training is often applied in an effort to correct problems. The proactive approach involves training as a continuous improvement process. It is not an intervention to correct a problem, but rather a function to prevent problems and promote organizational improvement[3]. The manner in which training takes place directly affects the results of the training. To ensure that training is delivered effectively and efficiently some thought must be put into the design, implementation, and assessment process. This process begins with a defining of the training needs, and analysis of the causes of performance problems and opportunities, and determining possible interventions[5]. From a safety aspect, this may include formal training or the development of informal training processes where the transfer of knowledge takes place through peer-to-peer interaction on the worksite. Assessing the most effective transfer of safety knowledge can greatly facilitate the learning process.

To determine from whom employees learn fall protection means and methods, and to determine how fall protection means and methods knowledge is most effectively transferred to employees, a survey was administered to employees of multiple construction entities located in the Pacific Northwest US. The intent of the study was to assess how the employers of construction entities provide fall protection training and to determine which employee(s) are most effective in communicating safety aspects within the entities. It is important to understand what training practices currently exist, as well as the effectiveness of the training, in order to determine best practice methodologies for delivering fall protection training to construction personnel.

Objectives

The primary objectives of this research were to:

1) Document existing training practices regarding fall protection in the construction industry, focusing on small construction companies.
2) Assess employee's perceptions of the effectiveness of training by:
   a) Assessing the types and methods of training provided to employees.
   b) Assessing from whom employees perceive training to be most effective.

A Likert scale survey instrument was developed to assess the process by which employees learn safety techniques. Research study participants were a representative convenience sample of construction personnel employed by construction entities located within the Pacific Northwest region of the United States. All of the construction entities participating in the survey agreed to assist in the survey process by ensuring that the employees completed and returned the survey in a timely manner. No minimum sample size was required because no specific statistical testing was to be performed. However, to advance the validity of the findings, an attempt was made to obtain as large a number of responses as possible, thus the survey was distributed to 170 participants.

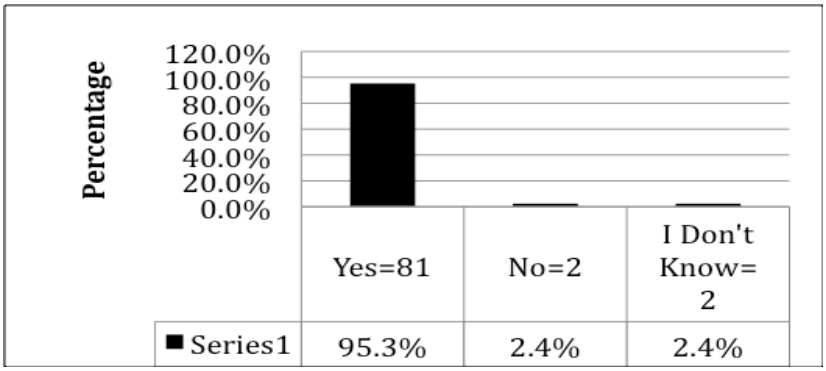
Analysis

Completed surveys were analyzed to ensure all of the responses were completed and that the responses were within the range of responses allowed in the survey instrument. An initial survey response rate of 58% (98 of 170) was received and 50% (85 of 170) met the study criteria for data analysis. All resulting data gathered from the completed surveys was organized and converted into an electronic format for data analysis. Descriptive statistical analysis was conducted on the resulting data to assess the process by which employees learn fall protection safety techniques. Calculations performed on the survey data consisted of the summing of the responses of the pilot study participants and determining the answer with the highest mean score.

Findings

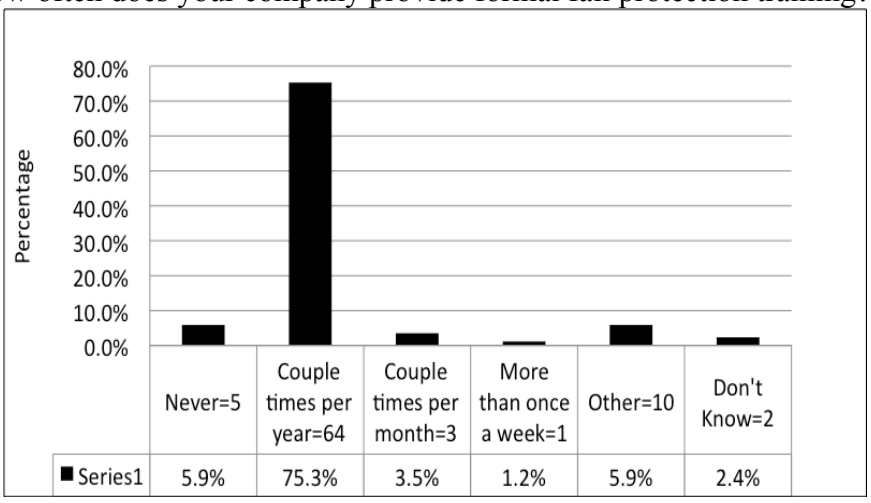
The following are the survey questions and the responses for each question.

Question 1. - Does your company provide formal fall protection training?



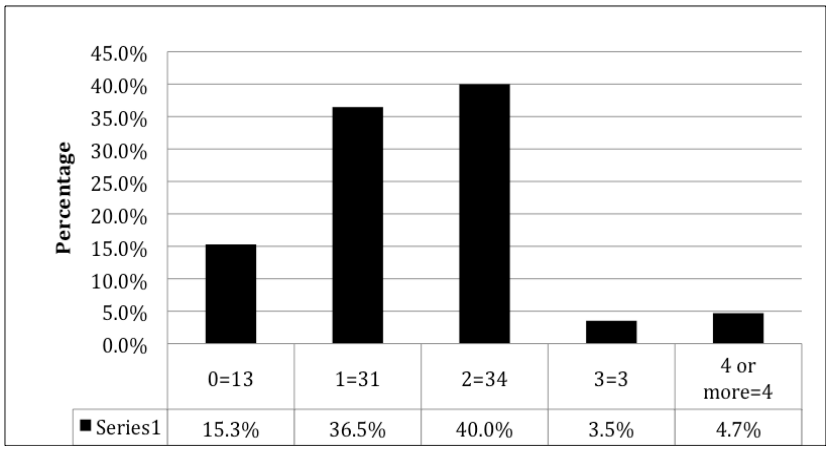
It was found that approximately (95%) of the emoloyees surveyed were provided at least some fall protection training. However, not all of the surveyed employees had been provided fall protection training.

Question 2. How often does your company provide formal fall protection training?



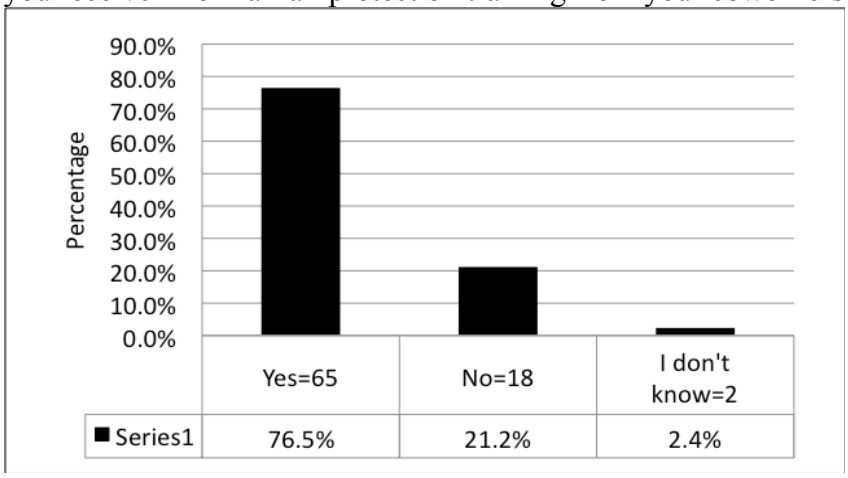
It was found that approximately (80%) of employees surveyed received formal fall protection training at least a couple of times a year, and approximately (5%) of employees were found to receive training a couple of times a month or more.

Question 3. How many formal fall protection training sessions have you received in the past year?



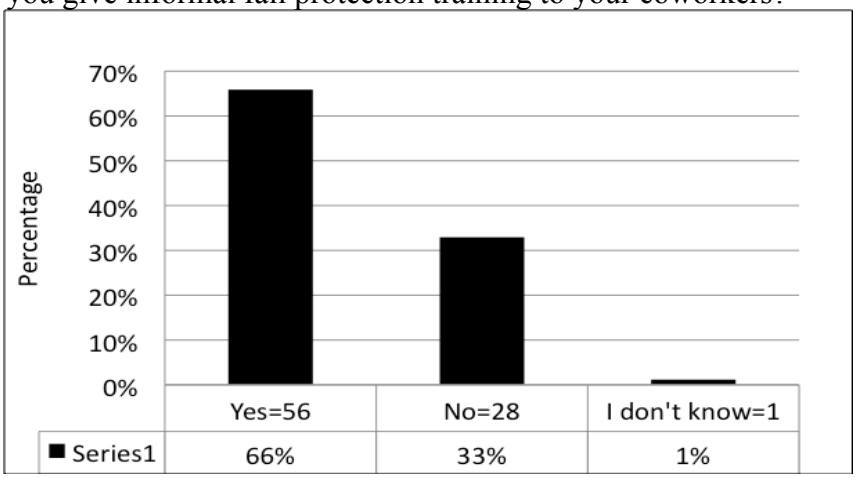
It was found that approximately 80% of the employees surveyed received formal fall protection training at least one time within the year of the survey but 13 of the employees had received no formal fall protection training within the year of the survey.

Question 4. Do you receive informal fall protection training from your coworkers?



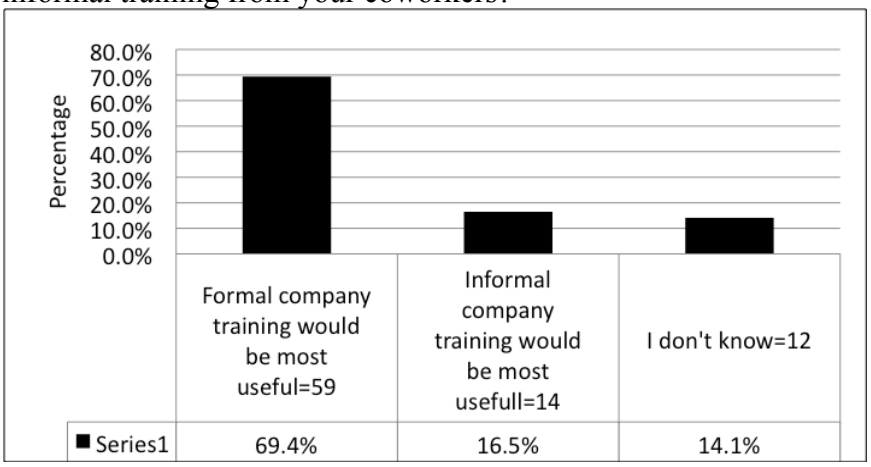
It was found that approximately 77% of the employees surveyed received informal fall protection training from coworkers. More surprisingly it was found that approximately 21% of employees surveyed received no informal fall protection training from coworkers.

Question 5. Do you give informal fall protection training to your coworkers?



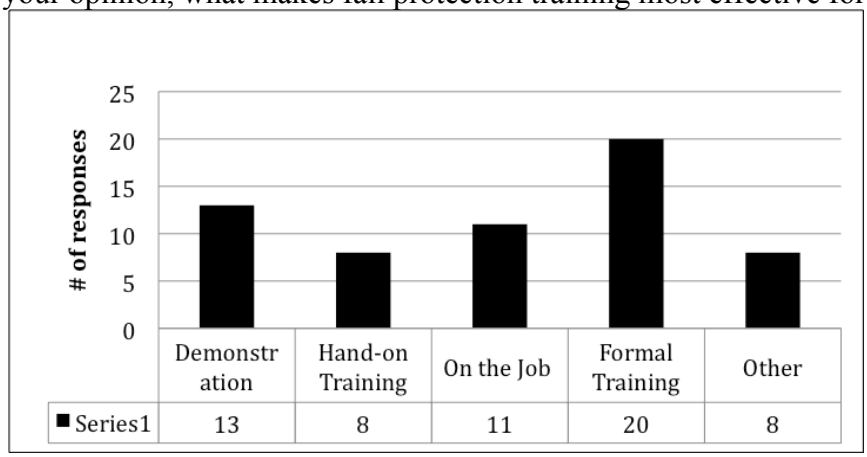
It was found that approximately 66% of the employees surveyed give informal fall protection training to their coworkers.

Question 6. Which is (or would be) the most useful to you: formal training from your company, or informal training from your coworkers?



It was found that approximately 69% of the employees surveyed perceived formal training from their company as most useful while approximately 17% perceived informal training from their coworkers most useful.

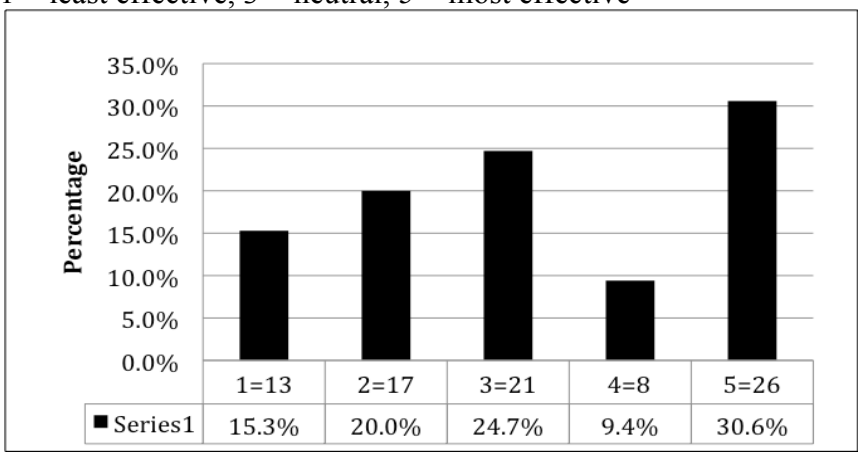
Question 7. In your opinion, what makes fall protection training most effective for you?



It was found that approximately 20% of the employees surveyed perceived "Formal" fall protection training most effective, 13% perceived "Demonstration" based training most effective, 11% perceived "On-The-Job" training as most effective, and 8% perceived "Hand-On" training methodologies as most effective when providing fall protection training.

Question 8a. Lecture based (tool box safety meeting)

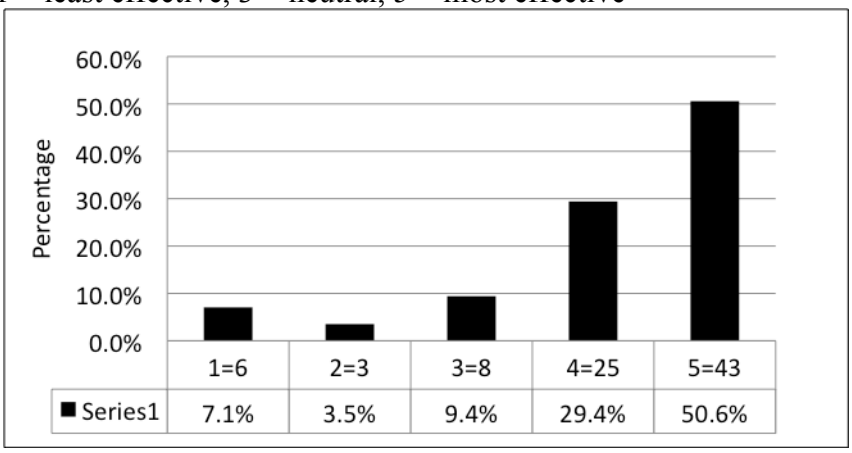
1 = least effective, 3 = neutral, 5 = most effective



It was found that approximately 40% of the employees surveyed perceived "Lecture Based" (Tool Box Safety Meeting) training methodolgies as more or most effective when providing fall protection training, approximately 25% found "Lecture Based" training methodologies to be effective and 35% found "Lecture Based" training methodologies to be less or least effective.

Question 8b. Demonstration

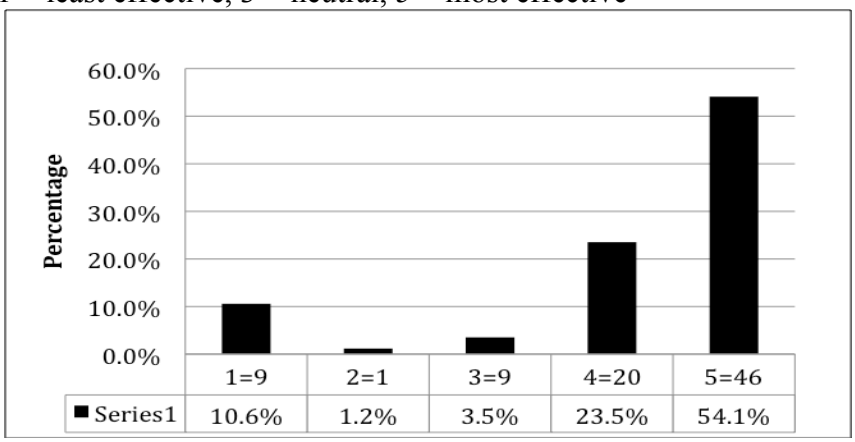
1 = least effective, 3 = neutral, 5 = most effective



It was found that approximately 80% of the employees surveyed perceived "Demonstration Based" training methodologies as more or most effective when providing fall protection training, approximately 9% found "Demonstration Based" training methodologies effective, and approximately 11% found "Demonstration Based" training methodologies less to least effective.

Question 8c. On the job training

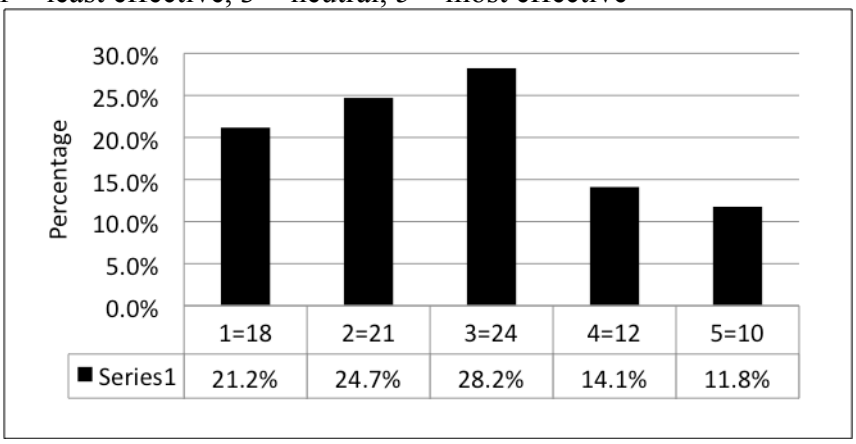
1 = least effective, 3 = neutral, 5 = most effective



It was found that approximately 78% of the employees surveyed perceived "On-The-Job" training methodologies as more or most effective when providing fall protection training, approximately 4% found "On-The-Job" training methodologies effective, and approximately 12% found "On-The-Job" training methodologies less or least effective.

Question 8d. Reading a fall protection manual

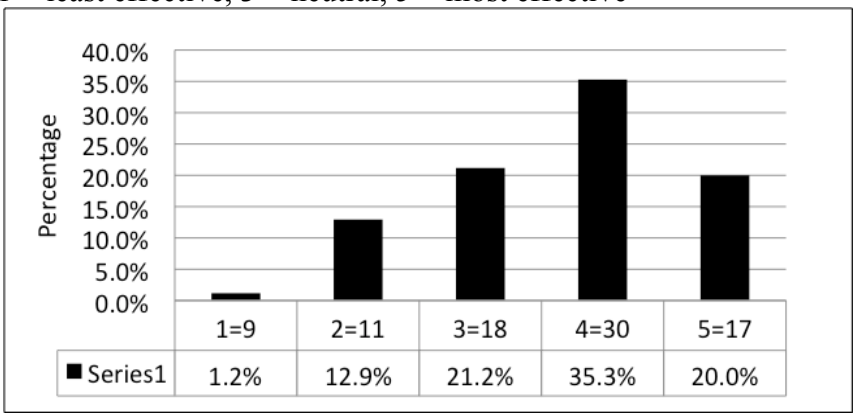
1 = least effective, 3 = neutral, 5 = most effective



It was found that approximately 25% of the employees surveyed perceived "Reading Fall Protection Manual" training methodology as more or most effective, approximately 28% perceived "Reading Fall Protection Manual" as a effective training methodology, and 46% perceived "Reading Fall Protection Manual" as a less or least effective.

Question 8e. Informal (learn from your peers or coworker)

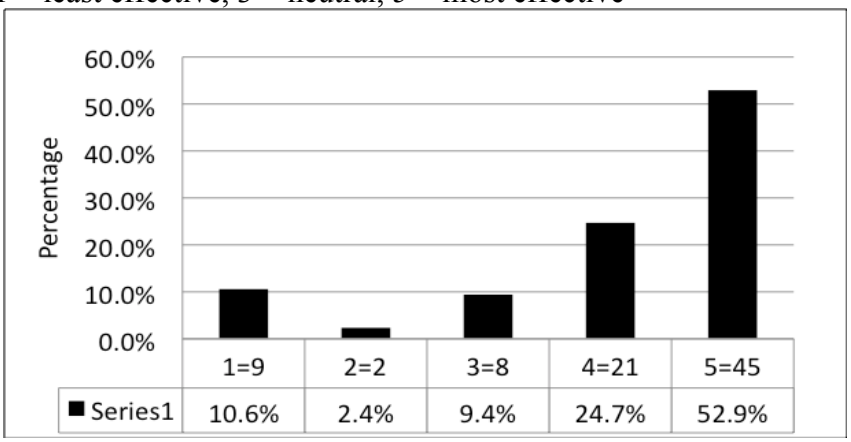
1 = least effective, 3 = neutral, 5 = most effective



It was found that approximately 55% of the employees surveyed perceived "Informal" training methodologies as more or most effective when providing fall protection training, approximately 21% found "Informal" training methodologies effective, and approximately 14% found "Informal" training methodologies less or least effective.

Question 8f. Combination of lecture and hands-on

1 = least effective, 3 = neutral, 5 = most effective



It was found that approximately 77% of the employees surveyed perceived a combination of "Lecture and Hands-On" training methodologies as more or most effective when providing fall protection training, approximately 9% found a combination of "Lecture and Hands-On" training methodologies as effective, and approximately 13% found a combination of "Lecture and Hands-On" training methodologies as less or least effective.

Conclusions

The primary goals of this research were to assess employee's perceptions of the effectiveness of training by first assessing the types and methods of training that they are provided, and then to assess employee perception of the effectiveness of that training. The research attempted to document the employee perceived most effective training methodology for the transfer of fall protection safety knowledge and to determine from whom fall protection safety knowledge is most effectively learned.

The results of the study found that the vast majority of the individuals that participated in the study (95%) received some sort of fall protection training at least yearly. Training methodologies used to deliver the training varies greatly as does the perceived effectiveness of the training. Formal training, demonstration, hands-on methodologies were all found to be effective methodologies to transfer fall protection safety knowledge, however no one method of training was definitively found to be the most effective. Additionally, it was found that a combination of both "Lecture" based and "Hands-on" based training was perceived as most effective.

This study of employee perceptions of the effectiveness of fall protection training at small commercial construction entities was directed to gain greater insight into effective training methodologies for the construction industry. The study was not an academic exploration but the results do apply directly to the training of students of construction management programs. Students of construction management will eventually be expected to provide effective training for industry employees and training students what training methodologies are effective is critical to their success as managers and critical for the effective training of employees.

Acknowledgements
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