Construction Tools, Equipment and Safety Signal Identification Implemented into Heavy Civil Lab

Brian F Keane
California Polytechnic State University
San Luis Obispo, California

The purpose of this project is to begin the development and implementation of a teaching module for commonly used construction tools, equipment, and safety signals into the Construction Management department's Heavy Civil lab. Using knowledge gained from former and future employers, past construction management classes, and online research I found the most commonly used tools, equipment, and hand signals used on construction sites and created visual representations and descriptions of them. Many graduates of the Construction Management program will find themselves on construction sites and there is no question that workers in the construction field are subject to life threatening hazards on a day to day basis. Knowing how to confidently and effectively identify what certain types of equipment are capable of and being able use non-verbal forms of communication will help mitigate some of the risk associated with being on a construction site. Upon completing the Heavy Civil lab students will have the necessary skills to effectively identify construction tools and equipment and communicate basic non-verbal safety signals that will keep everyone on the job safer.

Keywords: Tools, Equipment, Signals, Learning, Safety, Communication

Introduction

My senior project came from a desire to keep those that venture out into the construction field safer and better equipped to handle dangerous situations. The first internship in construction I ever worked was on a large commercial project in Napa, California. I was running around the jobsite and realized I did not have an adequate sense of what certain pieces of machinery were capable of and how to navigate safely around the jobsite. While I understood conceptually what was happening on a day to day basis I still felt out of my element. My education in construction up to this point in time had prepared me for the office side of the industry but not so much field work. This all changed when I took the Heavy Civil lab at Cal Poly taught by Ed Boucher. Part of this class involved looking at and being able to identify what certain pieces of equipment were and what certain hand signals we might see on a job meant. I was thrilled about learning this information and felt that I had come away from the class with some practical knowledge that I could apply in the construction field. After taking this class I learned that other sections of this lab did not go over equipment identification and I felt like they had missed out on a great opportunity. When it came time to pick my senior project I decided that I wanted to expand on the information I learned while taking Heavy Civil. I wanted to make a module that could be implemented by anyone teaching the course and hopefully pass on some practical knowledge for those who decide to go into the construction field in the future.

Project Description

The purpose of this project was to create a module for the Heavy Civil lab at Cal Poly that would teach students how to accurately identify common construction tools, equipment and safety signals they should expect to see out in the field. One of the first things I did was took an industry poll asking three questions, "Do you believe onsite workers can accurately identify tools, accurately identify equipment, and accurately identify hand signals?" The results were about what I expected. They showed that most workers believed they could identify tools or at least a majority of tools onsite, that there was a pretty even spread between knowing and not knowing equipment, and that a majority of workers did not operating signals. With this in mind I set out to make visual representations of these three things so that students would easily be able to identify them and hopefully get the results from my surveys to shift to a more positive result. I made eight different PowerPoint presentations showcasing these different areas in an easily accessible straightforward PowerPoint format (Figure 1, 2, 3).

Figure 1 Hand Signals

Figure 2 Equipment

Figure 3 Tools

I researched and found information on the most common types of hand signals, equipment, and tools one could expect to find and made my slides based on that.

Project Deliverables

The project provides eight PowerPoint slides that can be implemented at the professor's discretion throughout the quarter as well as quizzes that go along with several of the presentations. The presentations are as follows

- Cranes,
- Chains and Slings,
- Block and Tackle,
- Fibers, Ropes and Knots,
- Heavy Civil Equipment,
- Signaling,
- Tool Identification,
- Wire Rope and Wire Slings.

Lessons Learned

There was a ton of valuable information that I came away with from my senior project. Firstly, I have a much more in depth understanding of what tools, equipment, and hand signals I will most likely see on a jobsite. I feel confident that I would be able to safely navigate any jobsite that I may end up working on. I also learned how difficult it is to make a presentation trying to convey information to people I don't know. I had to find a balance of not putting too much or too little on my slides. I used my own personal experience as well as feedback from my peers about the right way to try and convey this information. Above all else this project taught me there is always more to learn about the construction industry. I think a of graduates come out of school thinking they know more about their field than those who went straight into working and that's just not true. If it wasn't for this project I feel like I would be lost in many ways on a jobsite. While it is a simple concept, taking the time to learn about the things I will be seeing daily will only help my career as well as keep myself and others safe on the jobsite.

Conclusion

Making this project was not as straight forward as I thought it would be going into it. While all this information is out there for people to look up and discover on their own if they should so chose, my hope for this project is that anyone looking at my project will be able to retain the information better than if they just glance over it online. More than anything else I hope that those that enroll in Heavy Civil in the future come out of it at the end of the quarter feeling confident that they can safely maneuver around any jobsite knowing the information they have gathered from this class. If this is the result of this senior project then I feel like I have accomplished my goal.