The construction superintendent plays a very important role throughout the construction process in order to deliver a successful project. This paper analyzes the skills Cal Poly SLO graduates lack to become effective superintendents. It does so by first analyzing quantitative research on papers that state which skills are important. Several interviews were conducted with professionals in the construction industry. These interviews provided input regarding what makes an effective superintendent. From this research, an effective superintendent must have an understanding of scheduling and sequencing of construction processes. Additionally, they must have the strength and stamina for construction supervision in the field physically and emotionally. Superintendents need to have effective take offs, analytical skills for productivity, and procurement and knowledge of site logistics. The superintendent must be able to implement value engineering during the construction process. The superintendent must identify safety hazards, take proactive steps to prevent their occurrence and understand the processes of each trade. This is necessary to identify possible errors that may arise during the construction process, to implement quality assurance, to communicate with different personalities on the job site, and to use Building Information Modeling (BIM). A survey of 17 questions was conducted which was sent out to Cal Poly SLO alumni. Conclusions show that students do not have the leadership skills to run a construction job site, implement value engineering during the construction process, implement quality assurance during the construction process, and know the processes of each trade to identify possible errors that may arise during the construction process.

Key Words: Construction Superintendent, Leadership Skills, Processes of Each Trade, Quality Assurance, Value Engineering

Introduction

An article posted by Brad Humphery states, “the first act toward building a successful project is by selecting the right [construction] superintendent.” So the real question is, what makes the “right” superintendent? There are many skills and traits that are attributed to that. An effective superintendent must be able to do both office work and field work. As a construction superintendent, one must be emotionally in control as there are psychological aspects of the role. Mentally, superintendents must be upbeat, alert and focused more than ever. They cannot be caught off guard, and not prone to negative caustic and offensive responses. This comes in hand with learning to deal with different personalities, building teamwork among potentially divisive and diverse project members, and being comfortable “in their own skin” (Humphrey, 2015). As stated by Gunderson, Barlow, and Hauck the construction superintendent must have people skills in order to be a successful. When they interviewed several superintendents and asked what the most important skill was to being a superintendent, one of them stated, “people skills because if you don’t have it you won’t have a successful project.” He went on to explain that without people skills that superintendent is not able to apply his knowledge and get people to do what he wants. Some of these people skills include being able to build trust with people, being a good teacher, and being a good communicator. The superintendent must be able to work with the subcontractors, architects, and owners and their styles of doing business (Gunderson, 6).

Gunderson, Barlow, and Hauck also state that the understanding of the work and sequencing for all the participants in the construction processes is essential to being a successful superintendent. They go on to explain that the superintendent needs to know each “facet of work,” which is the “knowledge of the industry and knowing the different methods.” They also explain that the superintendent does not need to know every single detail of the
project, but you have to “know how and when those pieces have to be in place.” They also found that many of their superintendents that they interviewed thought it was important to have knowledge of subcontractors. This is important in order to facilitate the sequencing of work on the project (Gunderson, 6).

Doing proper estimates for the cost of work and controlling those costs throughout the project are skills that successful superintendents need (Gunderson, 7). As the project progresses throughout construction, he or she monitors the expenses to ensure that the budget is maintained. If the project goes over budget, the superintendent is asked whether or not the company can make up the difference (Burger, 2018). A good way to make up the difference is by using the concept of value engineering.

Safety plays a huge role in every single construction project because if someone gets severely injured, then the entire project can be shut down by Occupational Safety and Health Administration until they investigate what happened. Since the superintendent is the one responsible for all personnel on the jobsite, he needs to enforce safety there. To do so effectively, he must understand the best safety practices and when, where and how to use them. They should consider (OSHA) violations and most common dangers in construction job sites. Site specific safety is another important factor to consider in every single job site. Every job site is different, which means that different factors of safety change (England, 2017). A good way to do this is to make an orientation that is site specific and identifies all hazards that have to do with the job site.

Building Information Modeling (BIM) is a useful skill to know how to implement into the running of a construction project because it offers many benefits. BIM is a process that uses computer technology to stimulate the planning, design, construction and operation of a building. A building information model is very useful because it gives the building elements, cost estimates, material inventories and a project schedule. This model can be used to demonstrate building quantities and shared properties of material that can be extracted. This is helpful to show systems, assemblies, sequences of work and document drawings during procurement detail, submittal processes and other specifications that can be easily interrelated (Salman, 3). The ability for a construction superintendent to use BMI and incorporate it to the job site ensures that the job runs more effectively.

**Objective**

The goal of this senior project is to identify the skills students coming out of Cal Poly SLO lack to become effective superintendents. There are 4 skills that industries in the construction industry feel students need to work on. The data that this senior project collects can be very useful to the construction management program at Cal Poly SLO if they decide to use it.

**Research Methodology**

A survey was formulated to obtain what skills students out of Cal Poly SLO lack to become an effective superintendent. The quantitative data collected through articles and interviews conducted with construction professionals helped formulate 17 questions and statements. The first 4 questions of the survey were to determine what role the individual played in the construction industry and their experience in it. The second set of questions were on a scale ranging from strongly disagree, disagree, neither agree nor disagree, agree, to strongly agree. At the very end of the survey there was a free response question which allowed for the respondents to comment on any additional knowledge they have on the topic.

Once the survey was finalized, the staff in the Construction Management department was able to send the survey out to Cal Poly SLO alumni.
Survey Analysis

There was a total of 44 responses and 42 of them completed the entire questionnaire. The respondents mainly consisted of project managers and the “other” category. The “other” category consisted of executives, presidents and vice presidents of companies. Residential, commercial, specialty, heavy civil and other construction were all categories that the respondents worked in. Commercial construction had the highest percentage that people worked in which was 82 percent. The respondents were then asked to see if they have had the opportunity to work with a recent Cal Poly SLO graduate from the Construction Management program within the last 5 years or if they were a graduate within the past 5 years; 89 percent answered yes.

12 of the 17 questions asked about skills an effective superintendent should have. Those 12 questions were set on a scale to see if they agree that a Cal Poly student had that certain skill. Out of the 12 questions, there were only 8 skills respondents agreed students had. One of the included skills is that students have the construction experience in order to understand scheduling/sequencing of construction processes. Also students have the physical and emotional strength and stamina for construction supervision in the field. Respondents agreed that the students have the skills to do effective take offs, procurement, and site logistics as well as be productive. Safety plays a big role throughout the construction process, and professionals in the industry felt that students were able to identify in the construction process in order to take proactive steps to ensure safety. Communication with different personalities is another important skill to have in order to communicate with different types of personnel, and students have this skill according to respondents.

Figure 1 asked whether students have the leadership skills in order to run a construction job site. The question showed a variety of responses throughout the board. This demonstrates that Cal Poly students studying Construction Management need to work on their leadership skills on the construction job site.

Students have the adequate leadership skills to run a construction job site.

Figure 1: Scale from Strongly Disagree to Strongly Agree vs. Percentage

Figure 2 shows the results to the questions whether students know how to implement value engineering during the construction process. There was a larger portion of people that disagreed with this statement. This means students need to work on the concept of value engineering.
Students know how to implement value engineering during the construction process.

Figure 2: Scale from Strongly Disagree to Strongly Agree Vs. Percentage

Figure 3 asked whether students know the processes of each trade in order to identify possible errors that may arise during the construction process. The majority of the people disagreed in this question.

Recent graduate students know the processes of each trade in order to identify possible errors that may arise during the construction process.

Figure 3: Scale from Strongly Disagree to Strongly Agree Vs. Percentage
Figure 4 asked whether students knew how to implement quality assurance during the construction process. There was a variety of responses on the board with this question. This means students need to work on implementing quality assurance during the construction process.

*Students know how to implement quality assurance during construction.*

![Bar chart showing responses to the question of whether students know how to implement quality assurance during construction.](image)

**Figure 4: Scale from Strongly Disagree to Strongly Agree Vs. Percentage**

**Conclusion**

Based off the survey there are 4 skills students need to work on to become effective superintendents. In total 36 percent of respondents disagreed that students had the leadership skills to run a successful construction job site.

38 percent of respondents felt that students did not have the ability to implement value engineering during the construction process. I was not surprised that these many respondents felt this way because of one of my interviews with a superintendent from Berkeley Concrete Inc., and he stated, “students need to understand to use cheaper materials during the construction process that serve the same function.” In other words student need to implement value engineering.

57 percent of respondents disagreed that students knew the processes of each trade to identify possible errors that arise during the construction process. This question did not surprise me either because while conducting my interview with the superintendent from Berkeley Concrete Inc., he stated, “construction experience in the field is essential to running work in order to understand possible errors that may arise.” Students need to have more hands on experience.

33 percent of respondents did not think that students knew how to implement quality assurance during construction. This goes in hand with knowing the different trades in order to know how to control the quality of the work before it gets built.
Further Research

A good way to further the research based on this project is to find a way to teach these skills in the Construction Management program at Cal Poly SLO.

For the first question that gave responses spread across the board, respondents felt that students did not have the leadership skills to run a construction project. Someone could conduct a survey or do research on what are the types of leadership skills needed to run a successful construction project.

Implementing value engineering is an important skill to have which respondents felt students must work on. The construction program at Cal Poly SLO can teach a class about alternate materials in construction projects. For example, offering a class that shows the different cost benefits when building different systems would teach value engineering. This class could also go in depth of the different materials general contractors can use on the construction job site.

Knowing the processes of each trade is the question that most respondents felt students need to work on. The Construction Management Program at Cal Poly SLO can make their labs more hands on. Also the Construction Management program needs to encourage students to do the carpenters apprentice program so that students can learn the different processes in construction. Furthermore, the Construction Management program can try to work with other unions. Perhaps working with the different trades such as the laborers, plumbers, electrician, sheet metal union, etc. to get an apprentice program with them as well.

The Cal Poly Construction Management Program can make a class which helps students become a superintendent. It can do this through focusing on the leadership skills needed to run a construction project. It can also focus the 4 skills found in this survey that students need to work on.
References


