

Skill Sets of Students in Comparison to their Preferred Route after College

Shay O'Laughlin

California Polytechnic State University, San Luis Obispo
San Luis Obispo, CA

Many of the superintendents and project managers today come out of higher education instead of coming up through the trades. This creates a large need for universities to produce both quality superintendents and project managers to run jobs efficiently and effectively in the future. This research paper focuses on the skillsets of construction management students at Cal Poly in relation to their anticipated career path, to see if students are choosing their path based on the skills, they have self-assessed or another factor. The hypothesis is that students are tending to not choose their route based on skills but instead choosing on some other outside factors. The survey to test this was created with eleven skills for the students to rate themselves on a Likert scale. All these skills were selected based on a literature review of previous surveys of which skills are most important in the industry for specific roles. The responses to the survey were then separated between their preferred route and averaged so that a quantitative analysis could be done. In this analysis we were able to see that contrary to the original hypothesis, students tend to choose their role based on skills, not other factors.

Key Words: Project Manager, Superintendent, Skills, Personality Traits, Construction

Introduction

As many superintendents currently in the construction industry start to get older there is a void that will open and need to be filled by the younger generation. This can happen by hiring more from the trades which is the traditional route for most companies or more from the universities like many general contractors have begun doing recently. The decision can be a difficult one to make, and from my time at Cal Poly it seems that most people tend to go into the project manager route over superintendent route.

The skill set that emerged as the most important is “people skills” (Gunderson, 2011, p, 299). One of the biggest roles of the construction supervisor as either a superintendent or a project manager is that of the people skills. This soft skill set can come naturally or be learned throughout childhood and into your professional career. “We need more superintendents with higher education. The role has changed from the crusty ex-tradesman to a more highly educated manager of people and processes” (Gunderson, 2011, p, 301). As it relates to the preconceived notions of college students that being a super in less “prestigious” than being a project manager is likely why many decide to go that route.

However, the industry is constantly changing and becoming more and more progressive with education being right in the center of that. As, school becomes more prominent they are still teaching technical skills and not the soft skills that ultimately will carry a person through their career and allow them to move up the ladder in a company.

The goal of this study is to test whether the reason for this trend is based on their skill sets aligning more with one role or there are other outside factors that lead people to making their decision. My hypothesis is that many people are choosing based on outside factors that may not have to do with their skillsets and how they will compare to that of the role in which they wish to pursue their career. The survey has been set up to study this question and by the end of the research we will be able to analyze what is happening.

Literature Review

Creating the survey was one of the hardest parts of this project and is where most of the research and literature review was needed. It was needed to ensure that the skills that I was going to survey were important to either the project manager role or the superintendent role. This would allow me to see where the students stand in relation to their industry counterparts. I first started with finding what were the integral skills of a good superintendent.

According to (Gunderson, 2007, p7) some of the most important skills for a successful superintendent include, people skills, understanding the work and sequencing, scheduling, estimating, and cost control, work ethic, and learning from other people. In another article by Gunderson, he elaborates more and says, “The skill set that emerged as the most important is ‘people skills.’ Other skills include ‘understanding the work and sequencing,’ ‘organizational and managerial skills,’ ‘scheduling,’ ‘estimating,’ and ‘cost control/awareness.’” (Gunderson, 2011, p7)

Next was to look at the skill sets of successful project managers for a comparison. Some of the essential project manager skills are, leading, communicating, negotiating, and problem solving (Edum-Fotwe, 2000). In an article by (Kawesittisankhun, 2019), they agree that negotiation skill is important as well as decision making, and project organizing skills to name a few. Finally, an article by (Zuo, 2018) again reinforces that communication, teamwork and collaboration, and negotiation are all skills to have as a project manager.

Along with the literature review that was done, I have pulled from my prior knowledge of the construction industry through schooling as well as multiple internships both in the field and the office. This experience allowed me to take the different skills that I found during the literature review process and categorize them as skills that are more useful for either project manager, superintendent or equally as useful for both. By doing so I was able to get a list for the survey that I would then be able to see if there is a correlation of self-assessed skills during college and preferred route after college.

Methodology

The methodology that was implemented for this project was very simple. The first step was to create a survey that would be eventually sent out to people. In this survey the first question would be what year you in school are. The reason for this is to ensure that most of the recipients are upper classmen who would likely know which route they want to go into better and have more of a grasp for what skills they have. After this question, will be what your preferred route is when going full-time. The

answers can be project manager, superintendent, preconstruction or BIM, and other. This survey is only for superintendent vs. project manager so any of the responses that were for neither of those did not get used in the analysis.

After the two initial questions the survey began asking for the self-assessed skill rankings. Some of the skills were meant to be aimed as superintendent skills, others as project manager skills, and some ad shared skills equally important to both roles. For a full list of the skills, the survey as filled out by the respondents is attached in the appendix. These skills were ranked on a Likert scale or a scale of 1-5 with 1 being low 3 being average and 5 being high. This is a common survey technique that allows for accurate answers that can easily be averaged for quantitative data.

After the survey has been created it was time for it to be sent out. It was sent out through the Cal Poly Construction Management Department to all of the construction management majors as they are the target audience of this survey. As mentioned before, it is important that the respondents have a good feeling for what their preferred route is when going full time and understand their skills. For this reason, the survey was sent with the note that only people who know this information should respond.

To have the quantitative data that we are hoping for we will need to get 30 responses. The survey achieved this which allowed us to effectively analyze our results and use the quantitative data that is so vital for analysis.

Analysis

The first question that I asked was what year you are. This is important to the results because the older the student the more likely they are to know what route they want to go into. Along with this, they will likely have more refined skills to go along with the knowledge of the route they want to go. Knowing this I asked mostly upperclassmen, except for a few underclassmen who answered as well. This is to ensure that the results for the survey are as accurate as possible for when people head into the workforce after graduation.

1. What is your year at Cal Poly?

[More Details](#)

● 1st Year	3
● 2nd Year	7
● 3rd Year	8
● 4th Year or higher	17



The next question that was asked was the most important one as it allowed me to separate the answers based on their preferred route. There were 35 responses but 5 will not be used as I am only looking at the project manager and superintendent route. So, in total we will be looking at 30 responses, 17 being for project manager and 13 being for superintendent.

2. What is your preferred route for full time work regardless of sector (i.e. commercial, heavy-civil, residential, etc.) ?

[More Details](#)



After these two initial questions the survey began the self-assessment of skills. The student respondents answered these questions on a Likert scale which is a 1-5 scale with 1 being low and 5 being high. After all respondents finished the survey, they were separated to allow for analysis. Each skill was then averaged for both the superintendent and project manager. This allowed the direct comparison between both the roles to see which set of students tended to have better skills in a category. Table 1 below shows the results of this and the comparison between both roles.

Table 1: The results from the survey have been separated between the students who selected superintendent and project manager then averaged based on skill.

Skill set Surveyed:	Superintendent Average	Project Manager Average
People Skills:	4.23	4.00
Scheduling Skills	3.46	3.53
Management Skills	4.38	4.00
Negotiation Skills	3.5	3.17
Financial Skills	2.69	3.59
Sequencing of Work	3.77	3.7
Work Ethic	4.84	4.43
Ability to learn from others	4.92	4.82
Problem Solving	4.54	4.29
Planning Skills	4.00	4.41
Communication Skills	4.3	4.29

Below is the graph of the results that we were able to take from the survey. It gives us a good visualization of the Table 1 from above and allows us to see which results were very close and which were one-sided. With this the analysis becomes easy to compare which skills are for which role and how the students skill match up.

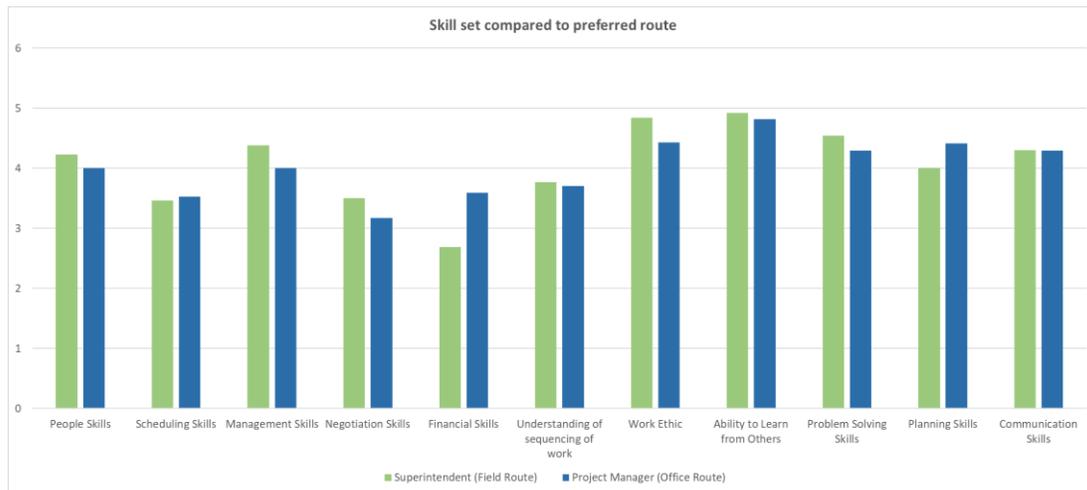


Figure 1: Average ratings of skills according to email survey filled out by the students

Five of the skills that I have surveyed lean more towards that of the skills needed by superintendent, three of them lean more toward the project manager role, and three are skills equally important of both roles.

The five that tend to be superintendent skills are people skills, management skills, understanding of sequencing of work, work ethic, and problem solving. In all five of these categories, the students that will be going into the superintendent role have a better average score.

As for the project manager role, the three skills that lean towards it are, negotiation skills, financial skills, and planning skills. In the negotiation skills category, the superintendent had a better average score or 3.5 to 3.17 of the project managers. This is one of the lowest scoring categories overall which makes sense as this is not something that is taught at all in school. Due to this I will not give this much weight in the overall conclusion. As for the financial skills, this is the most important job of a project manager, as it ultimately is their job to make money on the job. In this skill, the project managers outscored the superintendents 3.59 to 2.69. This is the largest gap in scores across all the skills. This is a good sign that people are tending to make decisions based on skills. Finally, the planning skill the project managers came out ahead at 4.41 to 4.0. Once again winning a category in which they should.

Finally, there were three skills in which there was no one role that was favored. These skills were, scheduling, learning from others, and communication. In all three of these cases the scores were within 0.1/5. This shows how important these skills are to both sides and reiterates that as different these roles are there is also a large overlap in skills.

Conclusion

Based on the results that I have gotten from the survey a conclusion can be made. This will be the opposite of the original hypothesis which was that people were tending to pick based not on their skills but on other preferences not related to skill sets. Throughout the skills that leaned towards one side, the role that should have done better did. That is seven of the eight skills in which this happened. Most of these were not very close either, the side that had better skills tended to be much better. Again, this goes directly against the original hypothesis and proves that the students are making educated decisions and tending to choose the path in which will fit their skills the best.

This result is a great look for both the students and university as it shows that the students are getting the education and exposure that they need to make the right decision. Hopefully, this trend can continue as it will be necessary for the longevity of the industry because many of the people in construction will be retiring soon and there needs to be a generation to step in and take their place.

Future Research

As for future research there could be more done on this topic in a few different ways. One idea would be to have peers rate each other so that people are not self-biased about their skills. This can lead to some problems and was likely relevant in my test, as one of the hardest things to do is rate yourself in certain areas or skills. Having peers grade each other would help to reduce this bias and produce more accurate numbers.

Another thing that could be done would be to have this test done again once they graduate and have worked for a while. Skills in school seem to be much different than what they are in industry so again this could lead to misguided numbers. Having someone reflect on what their skills were in college would be a great way to see if they did choose the right path based on their skills at the time and whether the decision, they made they are still with currently.

Finally, another great addition to this research would be to expand it into the preconstruction (i.e. scheduler, estimator) and BIM sectors. This would add another level to it as these positions are becoming more common within the larger and even many of the smaller companies as the technology and adoption of it continues to advance rapidly.

References

Edum-Fotwe, F., & Mccaffer, R. (2000). Developing project management competency: Perspectives from the construction industry. *International Journal of Project Management*, 18(2), 111-124. doi:10.1016/s0263-7863(98)90075-8

Gunderson, D., Barlow, P., & Hauck, A. (n.d.). Construction Superintendent Skill Sets. Retrieved June 03, 2021, from https://digitalcommons.calpoly.edu/cmgt_fac/12/

Gunderson, D. E., & Gloeckner, G. W. (2011). Superintendent Competencies and Attributes Required for Success: A National Study Comparing Construction Professionals' Opinions. *International Journal of Construction Education and Research*, 7(4), 294-311. doi:10.1080/15578771.2011.618964

Kawesittisankhun, K., & Pongpeng, J. (2019). Relationships of construction project manager, engineer, and foreman skills. *IOP Conference Series: Materials Science and Engineering*, 639, 012027. doi:10.1088/1757-899x/639/1/012027

Zuo, J., Zhao, X., Nguyen, Q. B., Ma, T., & Gao, S. (2018). Soft skills of construction project management professionals and project success factors. *Engineering, Construction and Architectural Management*, 25(3), 425-442. doi:10.1108/ecam-01-2016-0016

Appendix

Senior Project Survey: Skillsets of Students

Questionnaire to gauge the skills of students to be able to compare them to the skills of their full time industry counterparts. This is being done so that I can analyze if students are choosing the route which will best fit their skills.

This list of skills has been assembled through research as well as personal experience

Please rate your skills in the following categories with 1 being low, 3 being average, and 5 being high

1. What is your year at Cal Poly?

- 1st Year
- 2nd Year
- 3rd Year
- 4th Year or higher

2. What is your preferred route for full time work regardless of sector (i.e. commercial, heavy-civil, residential, etc.) ?

- Project Manager (Office Route)
- Superintendent (Field Route)
- Preconstruction or BIM
- Other

3. People Skills

1 2 3 4 5

4. Scheduling Skills

1 2 3 4 5

5. Management Skills

1 2 3 4 5

6. Negotiation Skills

1 2 3 4 5

7. Financial Skills

1 2 3 4 5

8. Understanding of sequencing of work

1 2 3 4 5

9. Work Ethic

1 2 3 4 5

10. Ability to Learn from Others

1 2 3 4 5

11. Problem Solving Skills

1 2 3 4 5

12. Planning Skills

1 2 3 4 5

13. Communication Skills

1 2 3 4 5

14. Any other skills not listed that you feel strongly apply please list the ability and rank your ability

--