

High School Student Perceptions of Women in Construction and How Increasing Awareness Changes Perceptions

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Diversity is one of the biggest struggles within the construction industry. Specifically regarding gender, women make up a distinct minority of just over 8% for construction managers according to the U.S. Bureau of Labor Statistics. In comparison, women comprise 47% of the overall U.S. labor force. This shows that the construction industry is behind because of certain barriers including perception of women's capabilities, socio-cultural issues, male dominance and more. This paper researches high school students' perceptions of women in construction as well as their prior knowledge and beliefs about construction management. This research also includes a brief presentation on what construction management is and some facts about women in construction. In order to see how student perception changed after they gained knowledge on the career path, this paper researched how their beliefs change. This study is not only to find out about students' prior knowledge, but also to see how effective a brief presentation is in order to increase awareness for the construction management career path and women in construction.

Key Words: student perception, education, gender-dominated occupation, women in construction, workforce

Introduction

The percentage of women in construction is at an outrageously low rate compared to the percentage of men in construction management. According to the United States Department of Labor, in 2008, women comprised just 8.2% of the workforce under the title of construction management, showing that men are the dominant gender in the industry. With construction being one of the largest industries in the United States with about 6,711,000 employees in 2016 as compared to as compared to wholesale trade which had about 5,867,000 employees in the same year (Bureau of Labor Statistics), it does not make sense that the diversity is so low. Drawing from departmental analysis at Cal Poly, the amount of female students within the whole construction management department is roughly 17%. There is an increasing number of students switching into construction management each year, so the industry interest is present, but many students do not seem to know what construction management is prior to applying for college and selecting a major. The overall intent of this project is to raise awareness about construction management and women in construction among high school students who will be looking for career paths in the near future. The knowledge of the students prior to the presentation must also be assessed in order to see if any new understanding of the profession was attained as well as the effectiveness of presenting to young students on the subject of construction management as a method for increasing understanding of construction management.

Benefit to Construction Management Students and Industry

This will be beneficial to the construction management department because there is a constant need to diversify the major and its students, which in turn will help diversify the entire industry. Research has shown that teams equally consistent of both men and women are the most successful due to the fact that male and female brains work in different ways. In order to overcome those innate differences, communication must increase. The construction industry relies incredibly heavily upon teamwork; each and every project has a project team in which communication is vital for the success of a project. Although men and women have different approaches to the many different problems that may arise within a project, they bring new perspectives, which makes for innovative decision-making. Because the long-term goal of this project is to increase awareness about construction management and women in construction, it is in hope that more women will choose construction management as their major and career path.

Limitations of Study

One of the limitations of this project is that it is a broad topic. There is a large base of knowledge that must be given before delving deeper into the information that actually must be conveyed about the many options within construction management and women in construction. The students in San Luis Obispo are not 100% reflective of perceptions of high school students in other locations. The classes presented to were also co-ed and the presentation had to cover a broad enough topic to ensure everyone present was engaged. The presentation may have provided a biased perspective of construction management that could have influenced the high school students' opinions in the post-presentation survey. Additionally, looking back at the student responses to the surveys, some of the students seemed confused by the phrasing of some of the questions, which was an issue that could have been avoided with more thorough revisions before handing the surveys out to the students.

Methodology

Surveys

Two surveys were administered through paper handouts to 100 students at San Luis Obispo High School and Arroyo Grande High School. The students' ages ranged from 14 to 18, but the majority of the students were 14 or 15. Regarding gender, there was about a 60/40 ratio for male/female, respectively. Please see Appendix A to see the full distribution of ages and gender. Both surveys had primarily quantitative questions in order to quantify the difference of perception of the construction industry before and after an informational presentation. The first survey, Pre-Presentation Survey, was administered before any information was given to the students so they had no prior bias. This was to gauge how much students knew about construction, as well as what they think about certain gender-dominated occupations. The actual survey can be found in Appendix B. The second survey, Post-Presentation Survey, was administered after a presentation on construction. Many questions on the Post-Presentation Survey were the same as the Pre-Presentation Survey to determine if and how their perceptions changed because of the presentation. The second survey can be found in Appendix C. Each survey also had a qualitative portion to find out their individual situations on how they decided what they want to do for a career and how the presentation should be improved.

Presentation

As previously mentioned, in addition to surveys, there was an oral and visual presentation to teach students about what construction management is. This presentation included the following information:

- Key characteristics of someone in the construction industry
- Process of a building and where construction management fits in
- Career paths within construction management
- Building information modeling
- Sectors of construction
- Facts about women in construction

Although this research is about perceptions of women in the construction industry, the presentation kept a gender-neutral approach to increase awareness and gauge interest from as many students as possible. Please refer to Appendix D for the entire presentation.

Results and Analysis

Pre-Presentation Results

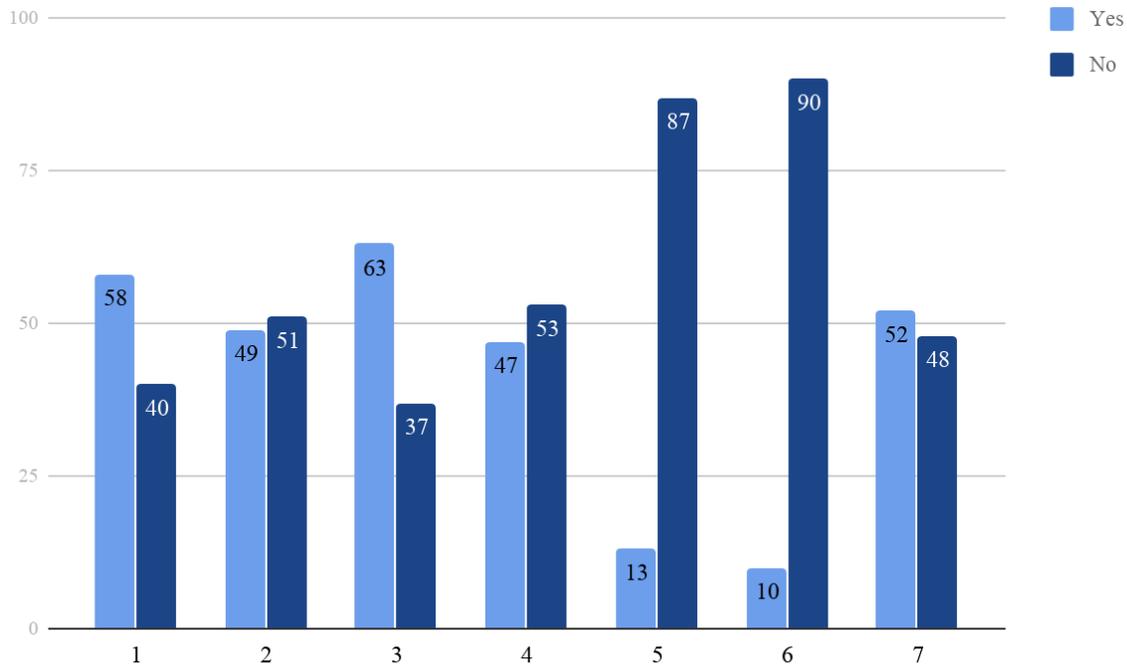


Figure 1: Pre-Presentation Survey results for questions 1-7.

Questions 1-7 from the Pre-Presentation Surveys are as follows:

1. Do you feel that certain genders have a dominant gender?
2. Do you know what construction management is?
3. Do you know what an architect does for a career?
4. Do you know what a construction manager does for a career?
5. Are you interested in working in construction management?
6. Have you taken any architecture classes?
7. Do you know what you want to do for a career already?

The majority of students said that certain occupations are dominated by a certain gender, which can be seen for question 1. This is very true, not just of the construction industry. Although there are gender-dominated occupations, it is important to understand that anyone can do any job. To see more on the students' perspectives of certain careers, please refer to Figure 2 below. For knowledge of what construction management is, the answer was split completely in half, which is shown in question 2. Similarly, question 4 shows that the role of a construction manager is understood by about half of the students. However, there are still more students that don't know what construction management is and what the role of a construction manager is. Furthermore, the role of an architect was known by a significantly larger number of students, which is shown in question 3. This shows that architecture is a profession that students are aware of more than construction management. Therefore, it is important that students are taught about the entire building process, including architects, engineers, and construction managers. Question 5 gauged student's interest in working in the construction industry, and it is shown that more than 80% of the students were not interested. With the connection that over half of the students aren't knowledgeable of construction as a career path, it makes sense that they are not interested in it for their future. This is something that could go up by increasing awareness on construction as a career. Question 6 had the biggest gap in answer that shows most students have never taken an architecture class. Based on their age, this shows that most students do not take architecture-based classes before high school. This is another reason most of them do not know about the different career paths within the building sector because they are not exposed to it. Lastly, question 7 shows that a

little more than half the students already know what they want to do for his or her career. This shows that many students decide what they want to do from a younger age than 14 or 15. Therefore, students need to be exposed to construction as a career path before high school.

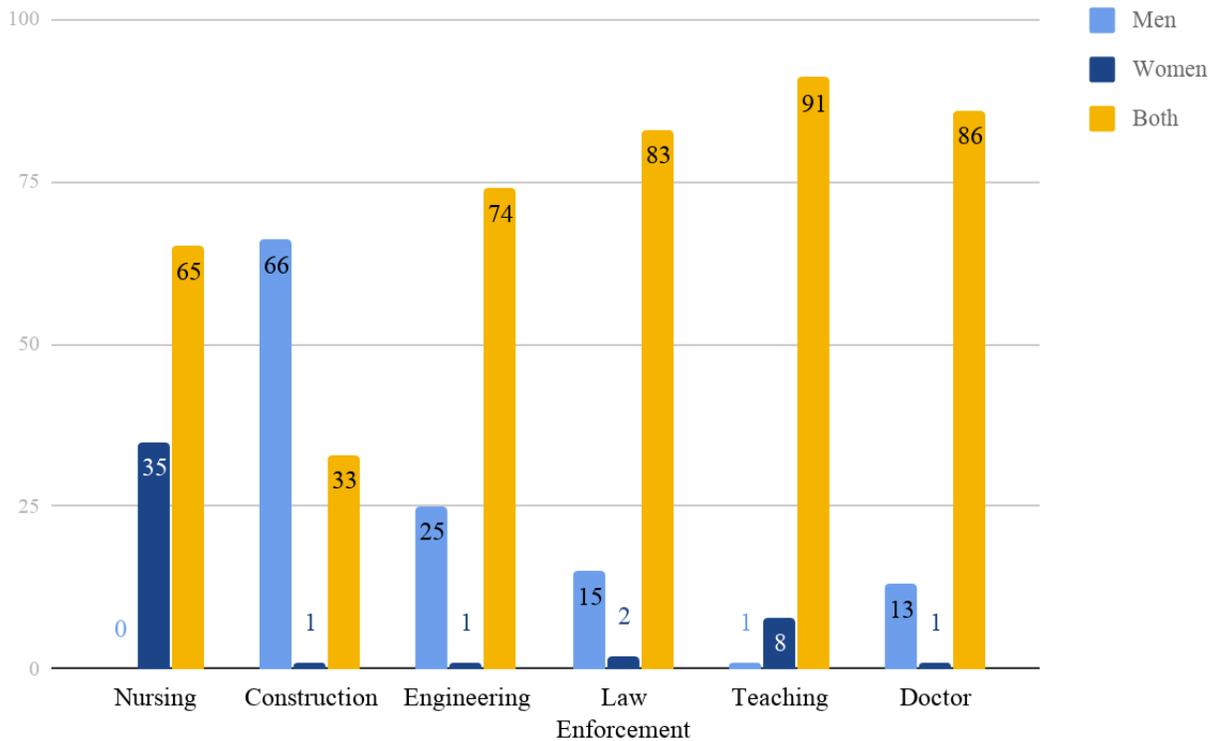


Figure 2: Students' Perception on Which Gender Works in Each Profession.

Out of the 6 professions in question, 5 of them had a majority of students answer that both genders work in the respective industry. The only one that did not get a majority answer of "both" was construction. This is the biggest factor in showing that not only do students have a bias towards which genders work in certain occupations, but construction is an industry that is behind the curve for gender presence. If there is any question as to why there are not as many women in construction management, it is because younger high school students do not even see it as an option.

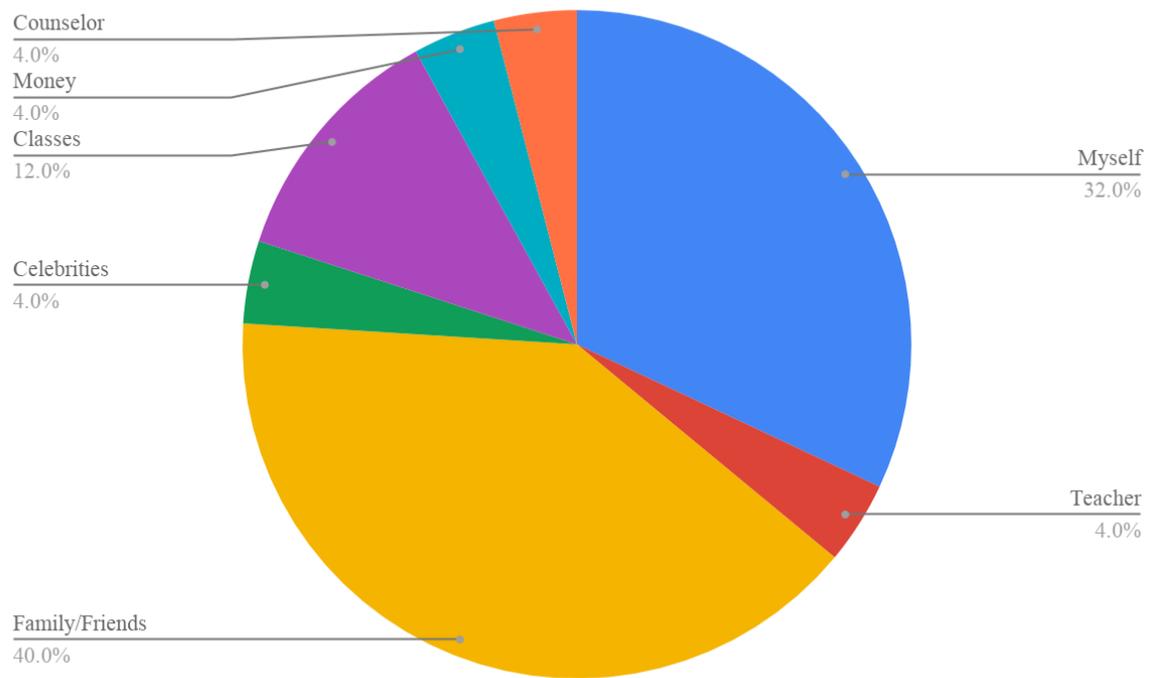


Figure 3: How Students Decide What They Want to Do for Their Career.

Following up question 7 of if students knew what they wanted to do in the future, the pre-presentation survey asked how they came to that decision. The most prevalent answer was family and friends, which made up of 40% of the students that responded yes to question 7. The second most prevalent answer was “myself,” which students explained that they figured out on their own what they wanted to do without an outside influence.

Overall, the pre-presentation survey served to understand what high school students already know about construction management and what their perception of gender-dominated occupations. High school students do have a biased perception of which genders work in certain professions, especially construction. As seen in the results, a majority of the students do not know anything about construction management, which also correlates to the lack of interest in working in the construction industry. This survey showed that a majority of students at the age of 14 and 15 already know what they want to do for a career. Therefore, it is important that students have a way to learn about construction management as a viable career path at a young age before the high school level. In addition, family and friends being the biggest factor in choosing a career shows that students stick to what they know when they decide what they want to do.

For complete data on quantitative questions, please refer to Appendix D.

Post-Presentation Results

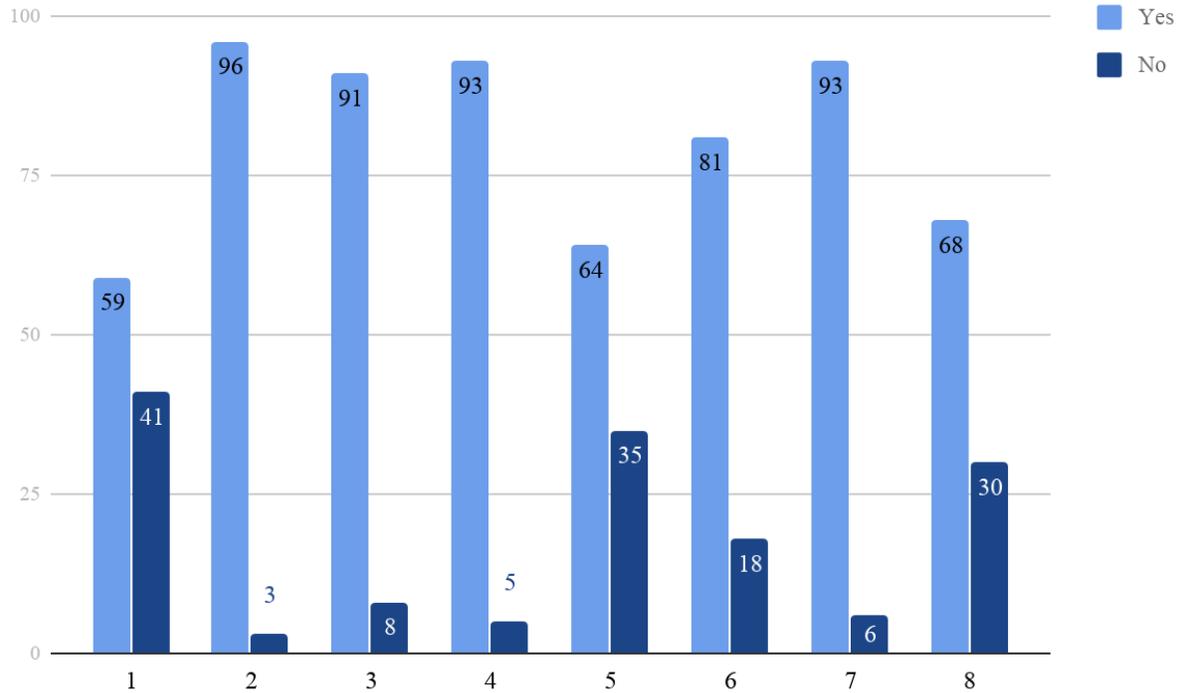


Figure 4: Post-Presentation Survey results for questions 1-8.

Questions 1-8 from the Post-Presentation Surveys are as follows:

1. Do you feel that certain genders have a dominant gender?
2. Do you know what construction management is?
3. Do you know what an architect does for a career?
4. Do you know what a construction manager does for a career?
5. Are you interested in working in construction management?
6. Did this presentation alter your perception of women in construction?
7. Did this presentation help you understand CM?
8. Would you like to learn more about construction management?

The students' answers regarding a dominant gender in certain careers was generally yes, certain careers do have a dominant gender, which is shown in question 1. This question was not necessarily going to change due to the presentation because that information is a fact, not a opinion to be altered. However, when the students were asked who they think works the most in the construction field, the answers were split evenly between "men" and "both" with no students answering "women". These responses show that while many students now think that construction is a viable industry for both men and women, the industry is still predominantly male. Questions 2 through 4 have an overwhelmingly large amount of "yes" that show that students understand construction management and architects/construction managers' roles. The Post-Presentation Survey also showed that more than half the students were interested in working in construction management. Overall, the students attested that yes, the presentation helped them to understand construction management better and altered their perceptions of women in construction. Lastly, question 8 shows that 68% of the students said they would like to have more information about construction management.

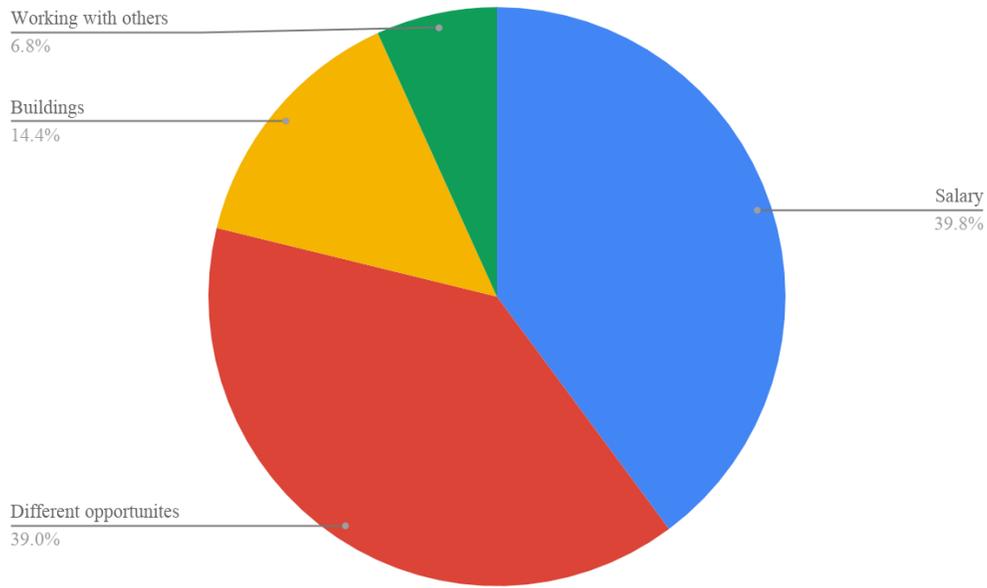


Figure 5: Aspect of Presentation that Peaked Students' Interest Most

The information about salaries and that fact that construction offers many different opportunities is what interested the students the most.

Comparison

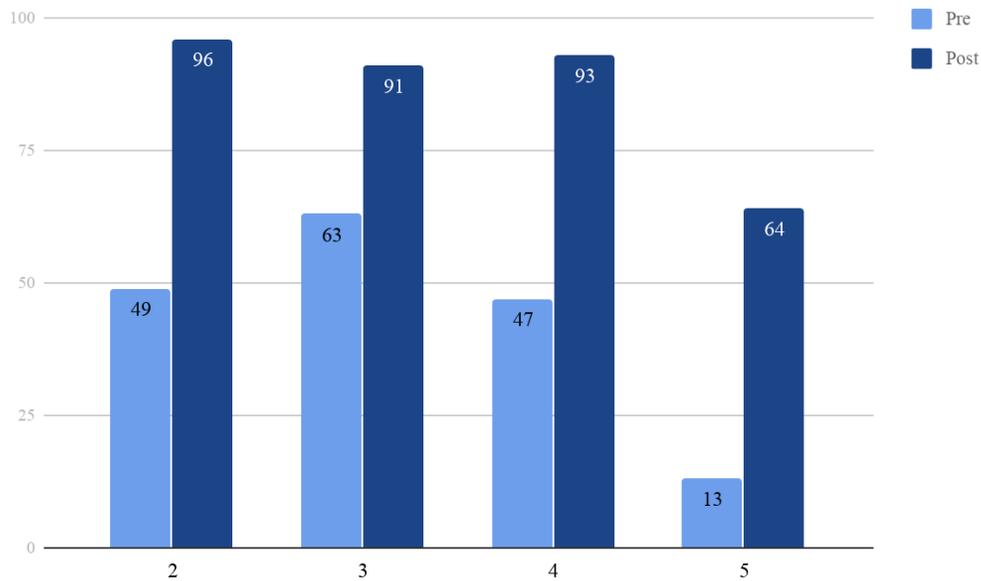


Figure 6: Questions 2-5 Comparison from Pre-Presentation Survey to Post-Presentation Survey, Students Answered Yes

Questions 2-5 from the Pre-Presentation Survey were repeated on the Post-Presentation Survey to be able to compare results quantitatively. The number of students that answered “yes” to all the questions significantly

increased. Because of the presentation, students have a greater understanding for what construction management is as well as what architects and construction managers do for a career. Questions 2-4 show that almost all of the 100 students surveyed answered yes, which affirms that the presentation was helpful and informative, especially for students who previously had no idea what the job title was. Students understanding the roles of an architect and construction manager show that they have gained knowledge on the building process and the people involved. Question 5 had the biggest increase of 51 students that answered “yes” to being interested in working in construction management. This is the most hopeful statistic because it shows that if students are aware of what construction management is and that it is a career option, then they are more interested in it for a career.

For complete data on quantitative questions, please refer to Appendix E.

Conclusion

Construction is one of the most male-dominated industries in the workforce; it is considered a non-traditional occupation for women. High school students affirm the previous statement with their prior perception that only men work in the construction industry. In order to create a change in perception and encourage women that it is a viable career path, this study gave a presentation to those students. The presentation served to be informative on construction management and the lack of women in the industry. The results show that students who are aware of the different opportunities of construction management, they are more likely to want to pursue it as a college major and career. Therefore, this study was successful in finding that high school students’ perceptions on women in construction and the construction industry as a whole do change when they have more information. In addition, it was successful in that it increased interest of students to work in construction management.

Future Research

Although this study was affirmed as successful through survey results, all aspects can be improved. The surveys showed that some questions should be reworded to help with the research. The main question that could be changed is “Who do you think works most in this profession?” in the Post-Presentation Survey. The Pre-Presentation Survey had the same question without the word most, which would have been better for comparison. In addition, putting in the word most, led to students answering “men,” which is true. It would have been interesting to see if more students put “both” if the wording was fixed. That would show that students’ perception had changed from mostly men to mostly both working in construction. Another question that could be changed from the Pre-Presentation Survey is about how students decided what they wanted to do for a career. This was left open-ended for students, but now that this study has shown what the main categories are, it could become multiple-choice. This is because some students put themselves as the reason, but everyone is influenced by someone or something. Getting rid of the “myself” option would show a better understanding of how students decide what they want to do. A question that could be added to the Pre-Presentation Survey is “Why do you think women don’t work in construction?”

As for the presentation, some suggestions from students included having more involvement or activities and showing a video of a construction manager going through their day at work. Some activities could include recap questions between each segment, Building Information Modeling workshop, or building blocks. This would require a longer period of time with the students. Emphasizing what the students react to is also a beneficial way to improve the presentation. The surveys showed that students’ interest increased when finding out about salaries and the many different opportunities within building that are not usually known. The study results can help improve on what to focus on during the presentation.

Because this study was successful, it can continue and grow. Presentations can become more engaged with students. Going to only two high schools on the Central Coast is limiting for data, so this research can continue to go to more schools and create a bigger impact to change perceptions and increase knowledge on women in construction as well as construction management. Another key point to keep in mind for future is that a majority of students in high school already have an idea of what they want to do; therefore, it might be beneficial to move to middle schools and see if there are different results.

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Appendix A

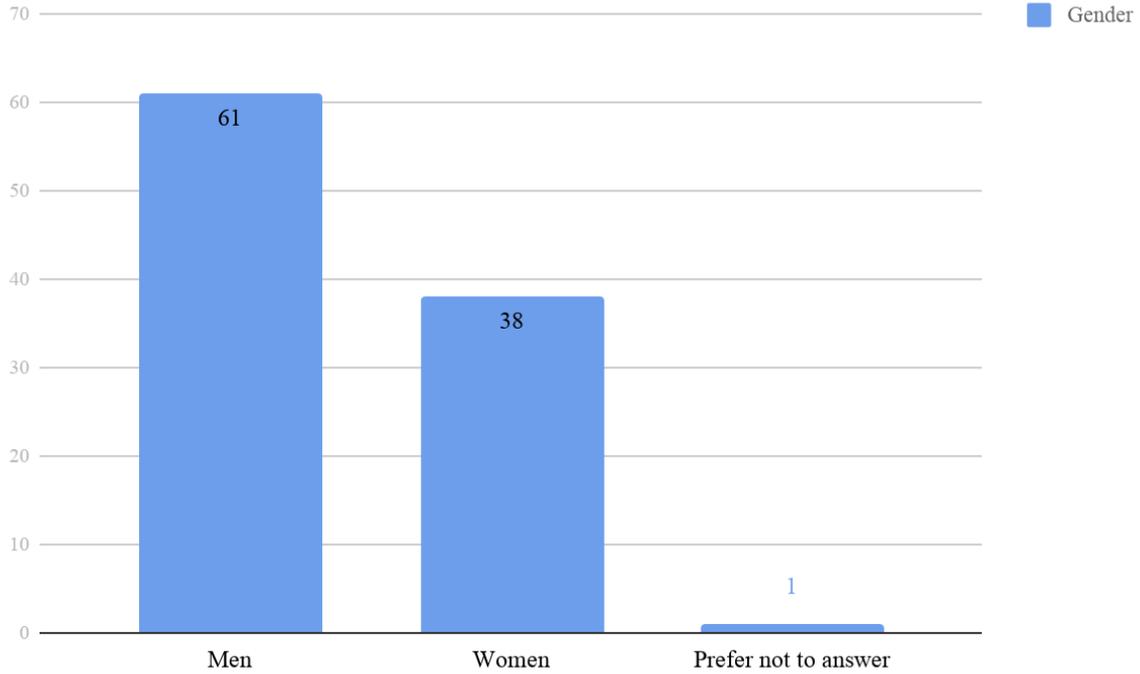


Figure 7: Student Gender Distribution

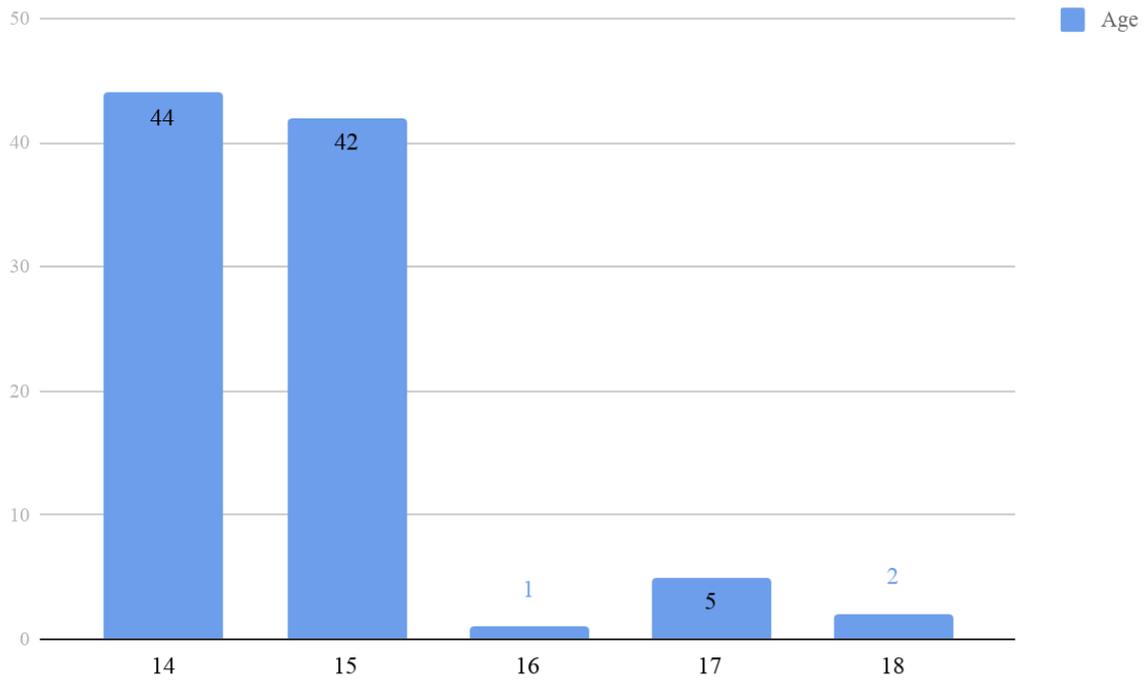


Figure 8: Student Age Distribution

Appendix B

Pre-Presentation Survey

What is your gender?

- a. Female
- b. Male
- c. Prefer not to answer

How old are you? _____

1. Do you feel that certain careers have a dominant gender?

- a. Yes
- b. No

For the following, who do you think works in these professions? Place X.

	Men	Women	Both
Nursing			
Construction			
Engineering			
Law enforcement			
Teaching			
Doctor			

Place X.

	Yes	No
2. Do you know what construction management is?		
3. Do you know what an architect does for a career?		
4. Do you know what a construction manager does for a career?		
5. Are you interested in working in construction management?		
6. Have you taken any architecture classes?		
7. Do you know what you want to do for a career already?		

If yes, how did you decide that? (relative, counselors, class/teacher, etc.) Please explain below.

Appendix C

Post-Presentation Survey

What is your gender?

- a. Female
- b. Male
- c. Prefer not to answer

How old are you? _____

1. Do you feel that certain careers have a dominant gender?

- a. Yes
- b. No

Who do you think works most in this profession? Place X.

	Men	Women	Both
Construction			

Place X.

	Yes	No
2. Do you know what construction management is?		
3. Do you know what an architect does for a career?		
4. Do you know what a construction manager does for a career?		
5. Are you interested in working in construction management?		
6. Did this presentation alter your perception of women in construction?		
7. Did this presentation help you understand CM?		
8. Would you like to learn more about construction management?		

What was it about the presentation that increased your interest?

- a. Salary
- b. Different opportunities
- c. Buildings
- d. Working with others

Any suggestions for future improvement of the presentation?

Appendix E

Pre-Presentation Survey Data

	Yes	No
1. Do you feel that certain genders have a dominant gender?	58	40
2. Do you know what construction management is?	49	51
3. Do you know what an architect does for a career?	63	37
4. Do you know what a construction manager does for a career?	47	53
5. Are you interested in working in construction management?	13	87
6. Have you taken any architecture classes?	10	90
7. Do you know what you want to do for a career already?	52	48

Who do you think works most in these professions?	Men	Women	Both
Nursing	0	35	65
Construction	66	1	33
Engineering	25	1	74
Law Enforcement	15	2	83
Teaching	1	8	91
Doctor	13	1	86

	Salary	Different opportunities	Buildings	Working with others
Who is it about the presentation that increased your interest?	47	46	17	8

Post-Presentation Survey Data

	Yes	No
1. Do you feel that certain genders have a dominant gender?	59	41
2. Do you know what construction management is?	96	3
3. Do you know what an architect does for a career?	91	8

4. Do you know what a construction manager does for a career?	93	5
5. Are you interested in working in construction management?	64	35
6. Did this presentation alter your perception of women in construction?	81	18
7. Did this presentation help you understand CM?	93	6
8. Would you like to learn more about construction management?	68	30

	Men	Women	Both
Who do you think works most in construction?	49	0	50

	Salary	Different opportunities	Buildings	Working with others
Who is it about the presentation that increased your interest?	47	46	17	8