

Exploring the Relationships between GPA, Construction Competition Participation, and Salaries of Construction Management Alumni

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Companies and students alike search for ways to find or grow into future successful professionals. This paper explores relationships between grade point average (GPA), construction competition participation, and salaries of construction management alumni. In this study, California Polytechnic State University, San Luis Obispo construction management alumni were surveyed to obtain their GPAs, and to determine if they participated in competitions as students as well as their career growth as measured by salary. The self-reported data was analyzed to identify relationships. The data suggests that there is a practical significance between GPA and competition participation with starting salary and salary growth. Generally, students with higher GPAs and competition participation tend to experience greater salary growth in their careers. This suggests that construction management students who perform the best in college will have the more successful careers, as measured by salary. Additional data sets consisting of different university alumni would be appropriate to estimate better the relationships between GPA, construction management competition participation, and salaries.

Key Words: Construction Management Competition, Alumni, Career Success, GPA

Introduction/Purpose

Every year construction management graduates enter the workforce. While in school, many students look for ways to increase their value to employers, hoping for a higher compensation package. Upon graduation, employers look for students who they believe will be successful and grow within their companies. What indicators can employers use to identify students who will have successful careers? Much of the determination is made subjectively during the interview process, this study seeks to explore objective indicators that could identify the students most likely to be successful, as measured by salary.

Universities place an emphasis on student success, particularly with grade point averages. Studies have shown that college GPA is a very significant determinant of income (Oehrlein, 2009). However, looking solely at GPA misses some potentially important information, particularly with construction management students. Many construction students have the unique option of participating in construction management competitions. Both universities and construction companies stress the importance of participation in construction competition for initial job acquisition and career success; some go so far as to say competitions are more important than GPA (Bigelow, 2012).

This study examined the relationships between GPA, construction competition participation, and career success as measured by salary of construction management alumni. Specifically, the study asked: 1) How was GPA related to salaries over time for alumni of the construction management program at California Polytechnic State University, San Luis Obispo? 2) How was competition participation related to salaries over time for alumni of the construction management program at California Polytechnic State University, San Luis Obispo? and 3) What was the effect of competition participation on GPA, starting salary, and salary growth? This research may prove valuable to students making educational decisions and to construction companies searching for talent.

Literary Review and Background

Many studies have searched for indicators of future success among college students. Studies involving GPA are the most popular, mainly due to its objectivity. Interestingly, there have not been many studies on other factors that might affect career success. The studies that have used GPA as an indicator have found differing results on career success. Although some have found little or no correlation between a high GPA and career success, most did find a positive correlation between the two.

Peter Cohen (1984) analyzed prior studies regarding GPA and its effect on career success. Cohen's findings were very conclusive that there is a positive correlation between GPA and many facets of career success. First, Cohen considered GPA's effect on job performance ratings. Of 50 studies, 46 suggested that GPA was positively correlated with positive job performance ratings (Cohen, 1984). Job performance is important to consider because generally it is directly related to career success and growth. Another area Cohen examined was income. Of 34 studies, 27 found that GPA was positively correlated with higher incomes. For promotions, 12 of 14 studies suggested GPA had a positive correlation. The overwhelming majority of the studies in each of these categories (job performance, income, and promotion) suggests that GPA is a very important indicator of career success.

Another study considered GPA's correlation with starting salary for accounting graduates. The results were conclusive and showed that, while somewhat minimal, there is a positive correlation between starting salary and GPA (Thibadoux, 2014). 6% of graduates with a high GPA had a very high salary, while 0% of graduates with a low GPA had a very high salary. Furthermore, the study found that 74% of graduates with a high GPA had a salary at or above average. Meanwhile, only 62% of graduates with a low GPA had a salary at or above average, with 38% falling below average. This data is unique because it relates directly to starting salary; and it found that a high GPA is positively correlated to a higher starting salary (Thibadoux, 2014).

A study that delved a little deeper into GPA's effect on salary was conducted by Linda Lousy (1995). She examined many potential factors that affect salary, including GPA. In particular, Lousy researched how GPA's correlation with salary changes for Caucasians and African Americans. The results showed that for 1 GPA point raised, Caucasian earnings increased by 9.5% and African American earnings increased by 25%. This clearly shows that higher GPA had a very positive correlation with earnings.

A later study examined the effect GPA point increase had on salary (Low, 2012). It determined there was a statistically significant and strong correlation between high GPA and high salary. More specifically, it found that a 1 point increase in GPA leads to an 8.4% increase in salary. This is particularly significant due to its similarity with Lousy's results, further validating the data that a 1 point increase in GPA leads to an approximate 10% increase in salary.

Other studies, however, did not find the same results. Robert Hogan wrote a literary review regarding many studies, most of which showed little or no correlation between GPA and salary. One study showed only a modest

correlation, another that it was slightly related to starting salary but not salary growth. Yet another found there was no correlation at all. A few of the studies cited called out personality characteristics as an indicator of academic performance (Hogan, 2013). This is of particular interest because these same personality characteristics may be what drive construction management students to enter competitions for which they receive no academic credit.

In Bigelow's (2012) study of student construction management competitions no correlation was found between starting salaries and GPAs. However, higher starting salaries were correlated with competition participation. The present study goes a step beyond Bigelow's, considering not only starting salary but also salary over time to explore the effects of GPA and competition participation in the workforce.

Methodology

This study used an Internet based survey to collect data. A convenience sample was used as sensitive information, such as salaries, can be difficult to collect. The sample consisted of alumni from the Construction Management program at California Polytechnic State University, San Luis Obispo. Because data was collected only from alumni of one school, the results should not be generalized to all construction management degree holders; but based on the sample size and geographic distribution of the former students, the researchers are confident that results can be generalized to the state of California.

The researchers designed the survey used for data collection. As the survey collected attribute data and did not attempt to measure constructs, no formal process for internal validity was deemed necessary. The survey required minimal time to complete, and was distributed electronically using Survey Monkey. 104 responses were received. The survey questions were:

1. What year did you start full-time employment?
2. What was your college GPA?
3. Did you participate in construction competitions?
4. How many years have you worked in the industry?
5. What was your starting salary?
6. What is your current salary?

After the responses were collected, they were sorted and examined using Microsoft Excel. Starting salaries were adjusted for inflation using the CPI Inflation Calculator from the United States Department of Labor. The data was then sorted by GPA, initially ignoring competition participation in order to identify relationships between GPA and starting salary or salary growth per year. A similar analysis was conducted considering just competition participation. Finally, the data was analyzed with both variables (GPA and competition participation) to determine any correlation. The two dependent variables examined were starting salary and long-term salary growth.

Results

GPA and Salary

Table 1 displays a summary of the GPA in relation to starting salary and salary growth. The high starting salary for the 2.0 – 2.5 GPA group is likely explained by the fact there were only 5 respondents within the group.

Table 1. GPA Groups' Career Success

GPA	Avg. Start. Salary	Median Start. Salary	Avg. Salary Growth	Median Salary Growth
2.0 – 2.5	\$63,600	\$64,000	7.8%	8.3%
2.5 – 3.0	\$61,600	\$63,000	10%	8.2%
3.0 – 3.5	\$63,100	\$62,000	22.5%	10.6%
3.5 – 4.0	\$63,300	\$63,000	11.4%	7.2%

The scatter plot comparing GPA and starting salary for the whole sample showed only a weak correlation (Figure 1). To investigate if there was a statistically significant association between GPA and Starting Salary, a Pearson's correlation was calculated, $r(102) = .108$, $p = .276$. Despite the appearance of weak correlation in Figure 1, there is no statistically significant relationship between GPA and starting salary.

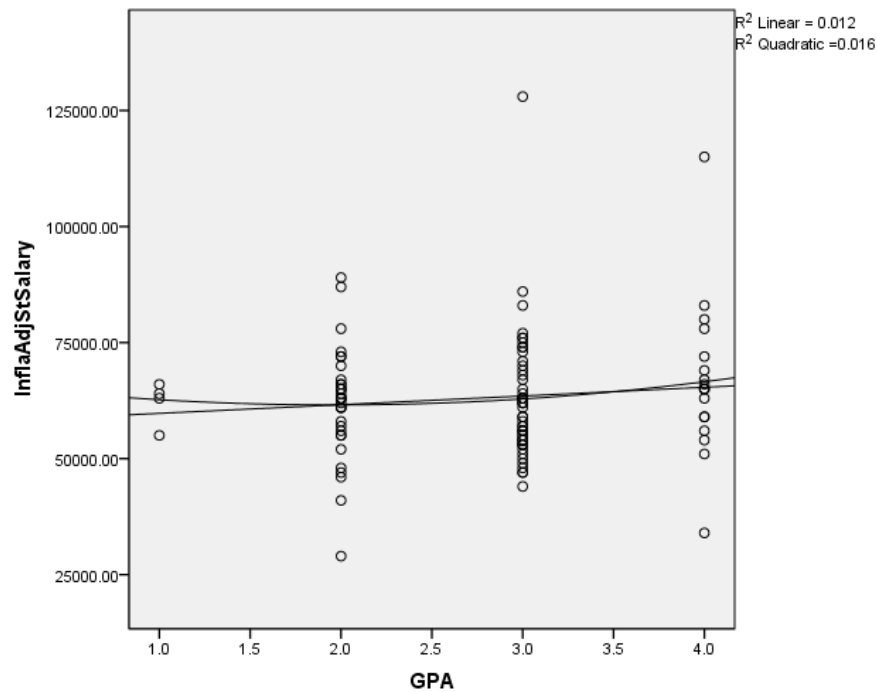


Figure 1: Correlation of GPA with Starting Salary

The Scatterplot comparing GPA with salary growth (Figure 2) displayed a slightly stronger correlation than GPA and starting salary. To investigate if there was a statistically significant association between GPA and salary growth, a Pearson's correlation was calculated, $r(102) = .249$, $p = .011$. The direction of the correlation was positive, indicating that students with higher GPAs tend to experience greater salary growth. The r^2 indicates that approximately 10% of the variance in salary growth can be predicted from GPA.

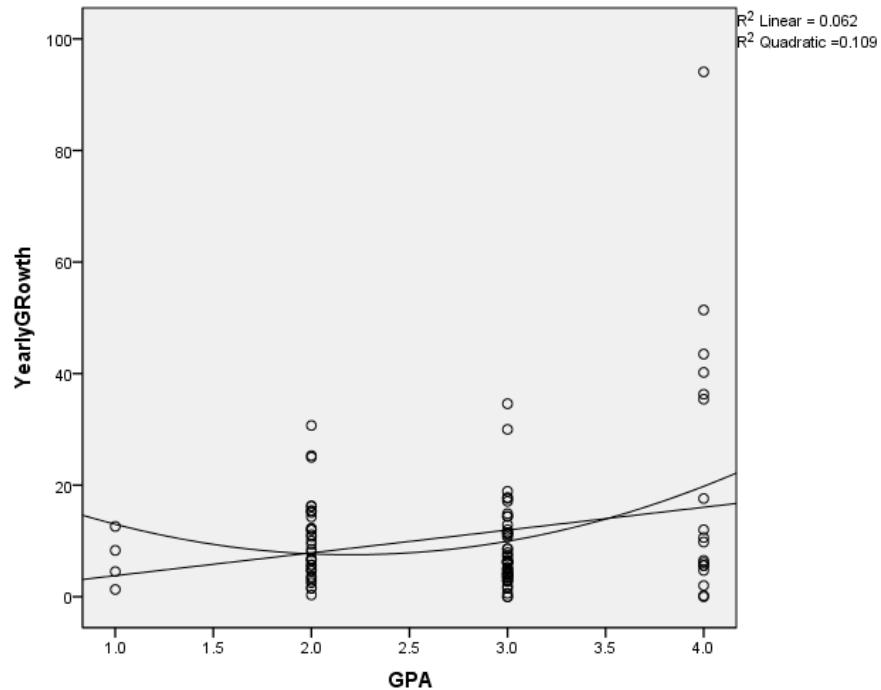


Figure 2: Correlation of GPA with Salary Growth

Competition and Salary

Participation in construction competitions does appear to have an effect on starting salary, supporting Bigelow's (2012) finding at Colorado State University. Those who did not participate in construction competitions had average starting salaries nearly \$4,400 lower than the average starting salary of those who did participate in competitions (Table 2).

Table 2. Competition Participation Effects on Salary

Competition Participation	Avg. Starting Salary	Median Starting Salary	Avg. Salary Growth	Median Salary Growth
No	\$60,700	\$59,000	8.8%	5.6%
Yes	\$65,100	\$64,000	13.1%	10.3%
Total	\$63,300	\$63,000	11%	7%

The distribution of the No Competition group was fairly well dispersed, but slightly back-loaded, peaking at \$55k (Figure 3). The Yes Competition group had a smaller dispersion, with a large peak at \$65k (Figure 5). Salary growth is also positively affected by competition participation. Those who participated had a 4.3% higher average growth and a 4.7% higher median growth than those who did not participate in competitions (Table 2). The distribution shows this well. Those in the No Competition group were concentrated at 5%-15% (Figure 4). Those in the Yes Competition group were concentrated between 5%-20% (Figure 6). This supports competition participation increasing the probability of higher salary growth per year.



Figure 3: No Competition Starting Salary Distribution



Figure 4: No Competition Yearly Salary Growth Distribution



Figure 5: Yes Competition Starting Salary Distribution

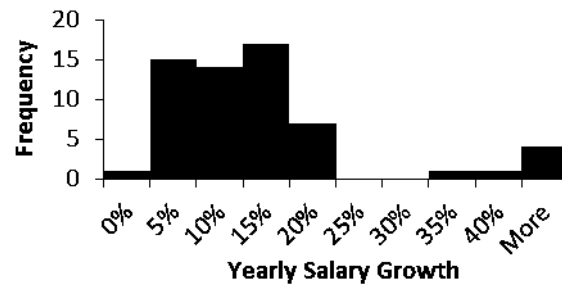


Figure 6: Yes Competition Yearly Salary Growth Distribution

Competition, GPA, and Salary

ANOVA was used to explore the effect of competition participation on GPA, starting salary, and salary growth. No statistically significant difference was found based on competition participation for GPA, $F(1,102) = .407$, $p = .525$, starting salary, $F(1,102) = 2.779$, $p = .099$, or salary growth, $F(1,102) = 2.970$, $p = .088$. Table 3 shows the mean differences for each group. The higher mean starting salary of \$4,430 for competition participants, while not statistically significant, does carry practical significance and is very close to the difference in means reported by Bigelow (2012). The higher percent of salary growth (4.33%) for competition participants similarly carries practical significance although it was not statistically significant. It should be noted that the mean GPA in Table 3 is not representative of actual GPA because responses were coded with 1 = 2.0 – 2.5, 2 = 2.5 – 3.0, 3 = 3.0 – 3.5, and 4 = 3.5 – 4.0.

Table 3 Means and Standard Deviations Comparing Competition Participation

Competition Participation	<i>n</i>	GPA		Starting Salary		Salary Growth	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Yes	61	2.82	.827	64,918	12,042	12.84	14.712
No	43	2.72	.701	60,488	15,011	8.51	8.810
Total	104	2.78	.775	63,086	13,459	11.05	12.741

The combined trendline (Figure 7) breaks up each actual GPA group into those who did and did not participate in competitions. The results are expected, and show a combination of importance on GPA and competition participation. Those with the highest GPAs had the highest salaries regardless of competition participation, with those who did participate slightly higher than those who did not. The next two groups were the 3.0-3.5 and 2.5-3.0 GPA groups who did participate in competitions. They are nearly identical. Following them were the 2.5-3.0 and 3.0-3.5 GPA groups who did not participate in competitions. The findings suggest that participation in competitions is correlated to career success as for those in the middle two GPA groups. Interestingly, the 2.5-3.0 GPA and No Competition group is projected to have higher salaries than the 3.0-3.5 GPA and No Competition group. Finally, the 2.0-2.5 group's salaries are lower than all others.

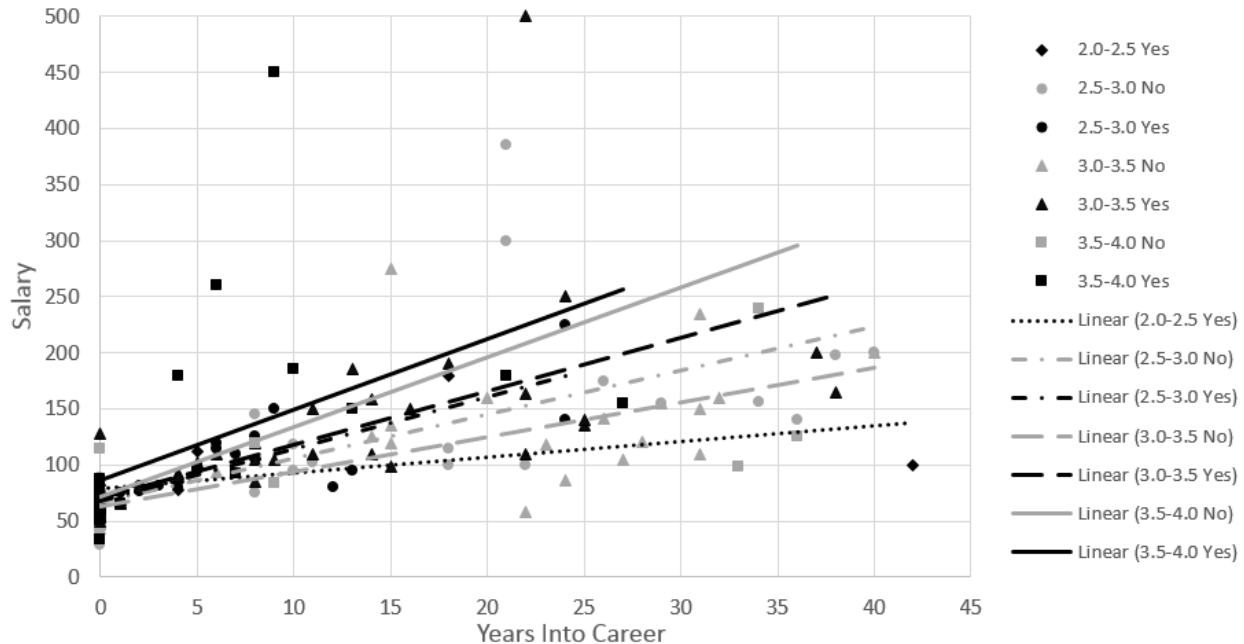


Figure 7: GPA and Competition Participation Grouped Salary Growth Trendlines

Discussion and Conclusions

The results of this study suggest that there is a practical significance between GPA, construction competition participation, and a successful career as measured by starting salary and salary growth. There was a positive correlation between GPA and salary growth, indicating that students with higher GPAs tend to experience greater salary growth. These results are in line with Oehrlein's (2009) conclusion that college GPA has an impact on career growth as measured by salary. Competition participation had a positive impact on both higher starting salaries and higher salary growth. Those who did not participate in construction competitions had average starting salaries nearly \$4,400 lower than the average starting salary of those who did participate in competitions. Students who have higher GPAs and participate in competitions are likely high achieving individuals to begin with; as Bigelow (2012) reported, students who participate in competitions are not "slackers". However, further research is required to increase the response rate of California Polytechnic State University construction management alumni, to provide more reliable results. The next question to be addressed is likely: What other factors are related to higher starting salaries and salary growth so those students can most effectively be identified?

The researchers acknowledge several limitations to this study. These limitations include but are not limited to: year of graduation impacts starting salary and salary growth due to the cyclical nature of construction, the data indicates a

number of outlier data points which could heavily influence averages, particularly given the small sample size, not all competition experiences are equal, and the data is all self-report.

Future Research

Additional data sets consisting of different university alumni would be appropriate to estimate better the relationships between GPA, construction management competition participation, and salaries. There is significant room for further research in this area. Among student competitors, identifying those who were team captains may be an additional indicator of success. Many other potential factors could affect future career success. Student club involvement and/or working a job while in school are both potential identifiers of students who are motivated and able to manage their time well - traits that generally lead to success. Internship participation is another factor that could identify future success of students. These are just a few more of the many potential indicators of career success that should be researched.

References

- Bigelow, B. (2012). *Perceived positive and negative effects of participation in student construction management competitions: a qualitative priority mixed methods study* (Doctoral dissertation, Colorado State University). Retrieved from <http://dspace.library.colostate.edu/handle/10217/71546>
- Cohen, P. (1984). College Grades and Adult Achievement: A Research Synthesis. *Research in Higher Education*, 20(3), 281-293.
- Hogan, R., Chamorro-Premuzic, T., & Kaiser, R. (n.d.). Employability and Career Success: Bridging the Gap Between Theory and Reality. *Industrial and Organizational Psychology*, 3-16.
- Loury, L., & Garman, D. (1995). College Selectivity and Earnings. *Journal of Labor Economics J LABOR ECON*, 13(2).
- Low, I. (2012). Capturing a College Education's Impact on Industry Wages Across Time: An Analysis of Academic Factors that Affect Earnings.
- Oehrlein, P. (2009). Determining future success of college students. *Undergraduate Economic Review*, 5(7), 1-32.
- Thibadoux, G., Scheidt, M., & Teffeteller, K. (2014). What Happens to Accounting Graduates With Lower Grade Point Averages? The Impact of GPA On The Life Course of Accounting Undergraduates. *American Journal of Business and Management AJBM*.