

The Impact of Education on Career Growth in the Construction Industry

Luis Rodrigues

California Polytechnic State University
San Luis Obispo, CA

A construction management degree and an apprenticeship are the two educational routes for a career in the construction industry. There are divisions within the workforce that reflect these educational pathways. Ideally, an alternative education would allow individuals without access to a university education to develop their career from an entry level position. However, if education has a long-term career impact, then limiting factors on education are consequently limiting on career growth. In examining if there is a ceiling on career growth relative to educational backgrounds, both education and experience were identified as key variables. In the case study presented, the education and experience requirements for open positions at a representative construction company were compared. Additionally, the average salary for each position was analyzed. The findings indicated that these variables are correlated, as positions without a degree qualification required twice much as experience to compensate for education. There did not appear to be a ceiling for individuals without a degree. However, the rate of career growth is arguably affected by the amount of experience required to substitute a degree. Further research must be done to determine the differences in rates of career growth for individuals within these two educational categories.

Key Words: Education, Career Mobility, Apprenticeship, Experience, Career Growth

Introduction

The construction industry is unique due to the fact that one can enter into the field via a four-year university, or work through the trades. In most career fields in America, there is the opportunity to advance to higher positions based on experience. It would appear that because one can take several different routes into a career in construction, that one would be able to advance given enough experience regardless of their ability to obtain a degree. Theoretically there is a lot of career opportunities within the construction industry. This is due to the fact that there is a large variety of career concentrations including, but not limited to, subcontractors, trade workers, and Project Engineers. However, there is an important distinction in the division of Construction Management and trade careers. This distinction is grounded in education. While providing different educational pathways ought to increase career opportunity, the limiting factors on educational opportunities in combination with this distinction in the industry consequently inhibit equal career growth. The purpose of this study was to determine whether or not individuals without a degree hit a ceiling in their careers within the construction industry, and to further examine the relationship between education and career growth.

The Significance of Education

As career opportunities have become increasingly competitive in today's society, education has been identified as the necessary foundation for a successful and long-lasting career. Subsequently, individuals with financial or societal limitations which inhibit their ability to obtain a university degree are often times pushed into employment opportunities that do not have the capacity for healthy career growth. In other words, individuals that experience educational inequality prior to joining the workforce are likely to experience the effects of that inequality extended into their careers. Within the construction industry specifically, the career growth of a trade worker without a degree can be limited to a certain title. Additionally, the process or progression of career development to reach this title can take the majority of a worker's life.

If inequality in career growth is tangible, it is owed to those facing career limitations to look at why this is occurring, and how it can be changed. One can determine its tangibility by measuring career growth comparatively, as well as examining the divisions in demographics and even social interactions within the industry. To understand limits in career growth one must first look at the root cause. If there are multiple educational paths that lead to a career within the construction industry, and societal inequality which inhibits which path to take, it follows that inequality in education will have a continued effect in said industry as well. Therefore, in identifying the root cause of inequality in career growth, educational opportunity needs to be examined. Acknowledging unequal opportunity is important in determining how a company can facilitate career growth for all employees, including those that work within the trades. In order for change to occur, there has to be a clear understanding of how constraints on education in combination with the weight of a college degree effect unequal work opportunity within the company as a whole. Understanding this problem will not only encourage upper management to provide support for those within the company who did not have the financial stability to gain a college education but provide the structure to do so. Once the “why” is answered, the “how” can be addressed moving forward. What follows is implementing programs or career paths for those who faced educational constraints before their careers even began.

Literature Review

Defining Career Growth

In examining the long-term impacts of education on career development, one must first define what career growth is. This can be done in two parts, first defining a career path and second career mobility along that path. A career path as defined by Sicherman and Galor in, *A Theory of Career Mobility*, is a “series of occupations, characterized by the transferability of skills and experience from one to another, that form a feasible working career” (Sicherman, 1990). Career mobility is the promotional process that is directly related to education, ability, and experience. The ability to be promoted or rate of promotion is typically an indicator of healthy career growth. Based on this definition, it follows that in studying the opportunity for career growth of various roles in the construction industry, one must identify education, ability, and experiential qualifications. In doing so, one can examine the weight that educational qualifications have as compared to the others on career growth as a whole.

Educational Paths to the Construction Industry

Apprenticeships

Apprenticeship programs are offered to teach a variety of technical skills. This includes but is not limited to carpentry, mechanics, and electrical skills. The construction industry thrives off its ability to pull highly skilled individuals from several different unions across the county. Apprenticeship programs are therefore an asset to the construction industry by producing workers who have learned applicable and technical skillsets in a format that extends beyond the classroom. The specificity and manner of application of the technical skills learned is how apprenticeship programs differ from university degrees which entail a broader education. In reference to the Associated Builders and Contractors Inc, the Northern California Chapter identifies the work process of an apprenticeship in carpentry. The topics include, “Concrete formwork, framing, finish carpentry, building envelope, and specialty installations” (Associated Builders and Contractors 2019). This curriculum allows individuals a diverse educational experience in carpentry that will allow them to enter into the industry with an array of different knowledge on building.

There are a several factors that influence an individual’s decision to take the trade route in construction. In comparing an apprenticeship program to a university degree or other method of entering the workforce, the common determining factors are cost, duration, and potential career benefits. Although, there are numerous trade apprenticeships an individual can participate in, the following information is in reference to the Carpenter’s Training Committees for Northern California.

- *Cost* – An individual that participates in a carpenter’s apprenticeship program does not pay any costs to work through the program. In addition, first period carpenter apprentices will earn an average of \$30.30 pay scale that will continue to increase with each period of apprenticeship completed. (Carpenter’s Training Committees for Northern California, 2019)
- *Duration* - The carpenter’s apprenticeship program is divided into 9 levels, each containing 2 classes. A total of 600 hours of training is required for each class. Every 3 months, participants are required to attend 4 days of mandatory training at a specific facility to complete a period of training and move on to the next period of the apprenticeship. An individual will graduate from the program after completing a total of 4800 hours of training and be rewarded a Journeyman carpenter title. (Carpenter’s Training Committees for Northern California, 2019)
- *Potential career benefits* - Individuals are able to learn technical skills and apply them while working on projects for a company. In addition to new knowledge, the pay of carpenter apprentice’s increase as time is accrued during the program. Eventually, an individual will graduate with experience and will be compensated as a Journeyman.

A Construction Management Degree

Many occupations often require a high school diploma, however not all opportunities require a four-year bachelor's degree. A Construction Management degree is an emerging education path in four-year universities. Those who take on the challenge of a degree in Construction Management, are immersed into a multifaceted curriculum that informs individuals on both the hands-on building of a project, as well as the business, management, and scheduling processes of construction. The curriculum of a Construction Management Degree is defined by the California Polytechnic State, San Luis Obispo as follows:

The curriculum in Construction Management leads to the Bachelor of Science degree which is accredited by the American Council for Construction Education. Major emphasis is placed on organizing and managing the construction phase of society's efforts to improve the environment. The constructor is an important member of the building team and requires a professional knowledge of techniques, materials, equipment, job planning and cost control to add to the contributions of the planning and design professions. Graduates of this program can help supply the urgent needs of the construction industry and its related fields.

The following quote provides insight on a Construction Management degree at a four-year university. A degree in Construction Management prepares and educates students on the processes of administration in regard to a construction project, putting an emphasis on maintaining a budget and schedule. The majority of a Construction Management degree is learned through lectures, labs, and collaboration assignments with other students. Unlike an apprenticeship, hands on building is a small fraction of the curriculum.

As stated previously, the common determining factors in evaluating an educational path are cost, duration, and potential career benefits. The following are the average statistics of these factors relevant to a Construction Management degree at the California Polytechnic State University, San Luis Obispo:

- *Cost*: The average cost for an in-state undergrad student = \$9,942 per quarter of education (Cal Poly Financial Aid, 2019)
- *Duration*: 4 years for B.S
- *Potential career benefits*: A Construction Management Degree allows individuals to be well-versed in the various management processes of a construction project. In addition, a Construction Management student is provided several opportunities to participate in summer internships, learn about companies through informative sessions, and participate in career fairs that help facilitate a job in construction after graduation. Furthermore, the median salary for a Construction Management graduate is \$60,000. (Cal Poly, 2019)

Who Gets Construction Management Degrees? The question then becomes, with the previously stated determining factors influencing educational opportunity, what type of individuals are attending four-year universities in order to pursue a career in construction. In a recent study titled, *The Demographics of the U.S. Construction Management Undergraduate Students for 2015* by Eric Holt and Christine Chasek, students analyzed

several characteristics of the Construction Management student body across the nation. The graph depicts the racial background of undergraduate students that have the ability to attend a four-year university that offers Construction Management as degree of study. In reference to the graph, Caucasian was the largest population represented, compared to students of color who represented less than a fraction of students attending a four-year university for a Construction Management degree (Holt & Chasek, 2016). The demographics based on ethnicity for individuals that pursue an apprenticeship program is not readily available

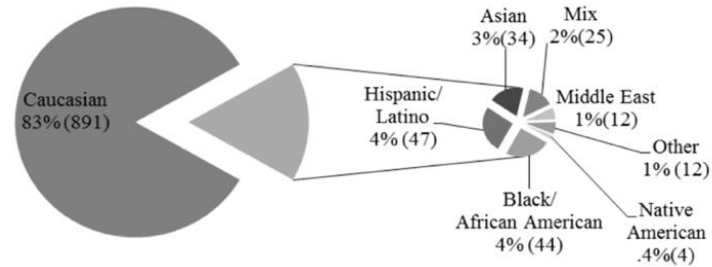


Figure 1: Demographics of Construction Management Students in 2015 identified by ethnicity

Career Pathways in the Construction Industry

The figures above depict two educational pathways into the construction industry. Figure 2 shows the common career path for an individual that graduated from a four-year university with a degree in Construction Management or related field of study. Figure 3 outlines the common career path for an individual from an apprenticeship program, focused specifically on a carpenter apprentice as an example.

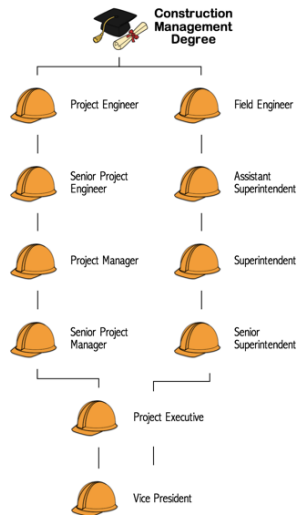


Figure 2: Common career path for individuals with a four-year degree in Construction Management

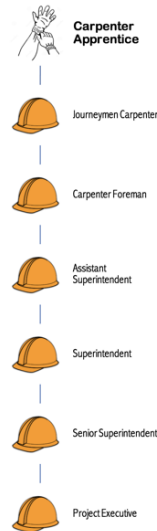


Figure 3: Career path for individuals that participate in an apprenticeship in Carpentry

A Case Study on the Impact of Education on Career Growth in the Construction Industry

Introduction

The following case study is intended to show the various career paths for a general contractor. Specifically, this study focuses on individuals that have access to a university degree in Construction Management, as well as those who began their careers via apprenticeship programs. In order to understand the limitations of career mobility due to inequalities in education, this study identifies both sides of construction [Trade vs. Office] and analyzes career growth in a functioning construction company. In addition, this study provides statistical information in relation to education and the amount of experience needed in lieu of a degree.

Background

For the purposes of this study, this paper will refer to the company as the 'representative construction company'. This company is a large general contractor, that specializes in commercial building in the Bay Area. The following information is pulled directly from the homepage of the company's website and provides requirements for certain occupational positions within the company.

Methodology

In order to determine if there is a ceiling on career growth relative to educational background in the construction industry, the methodology of this study was a collection and analysis of a combination of both qualitative and quantitative data. The qualitative data was gathered from an interview conducted with a Superintendent from a representative construction company, as well as Human Resource information provided. Quantitative data was recorded from all listed open positions within a representative construction company, totaling 37, that provided required or desired numerical values of experience and education. Average salary for each position was also calculated. The data was then organized respective to education requirements, and analyzed comparatively. The aim of this method was to identify if there is a difference in availability of positions and average salary relative to education level. Possible variables were identified and considered in the analysis of the results of this study. The data represents only the open positions in the company that have education and experience requirements. In addition, salary information was gathered from Glassdoor, which depicts average salaries for positions where employees were willing to provide information. Some average salaries were not obtainable on this platform. Furthermore, the data presented are not all entry level positions, which leads to positions that do not require a degree having a wider range of compensation and experience requirements, resulting in higher averages. After accounting for the potential variables, comparing the qualitative and quantitative data collected provided deeper insight into the relationship between career potential and education, as well as the relationship between education level and experience required.

Results

The results indicated that there is a greater availability of positions that do not require a degree at the representative construction company, as seen in Figure 4. However, positions that did not have a requirement had an increased amount of experience necessary. The average experience required for positions that require a degree is 4.3 years (Figure 7), which is significantly less than the amount of experience required for positions that do not require a degree which had an average of 9.8 years (Figure 7). The relationship between experience and education level can be seen in comparing the estimator position in Figure 5 and Figure 6. Individuals with a degree can qualify for an estimator position after 5 years of experience in a related field. Individuals without a degree can qualify for the same position however, the experience needed increases to 10 years. Additionally, variations were found in salary and experience required in examining positions with the least amount of experience required for both groups. Of the open positions that required a degree, the least amount of experience necessary was 0 years for the Project Engineer position (Figure 5). Comparatively, of the open positions that did not require a degree, the least amount of experience required was 5 years for a Field Office Coordinator (Figure 6). The average salary for a Project Engineer at 0 years of experience is \$81,160 (Figure 9). Although the experience required goes up by 5 years for a Field Office Coordinator, the position requiring the least amount of experience of those which do not require a degree, the salary decreases by \$32,160, putting the average salary of this position at \$49,000 (Figure 9). Lastly, the results indicated that the average salary for positions without a degree requirement was higher than the average salary for

positions with a degree requirement (Figure 8), however, the data set of positions without a degree requirement was larger and had a wider range of salaries.

Number of Open Positions

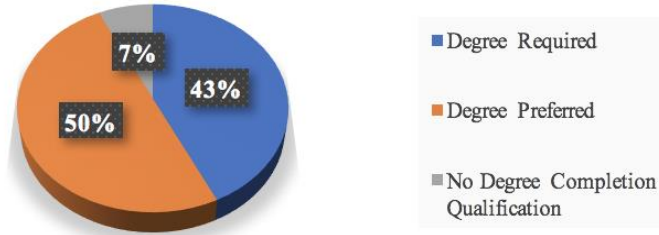


Figure 4: Percentage of open positions at a representative construction company with a degree requirement, degree preferred but not required, and no degree completion qualification

Years of Experience (With Degree)

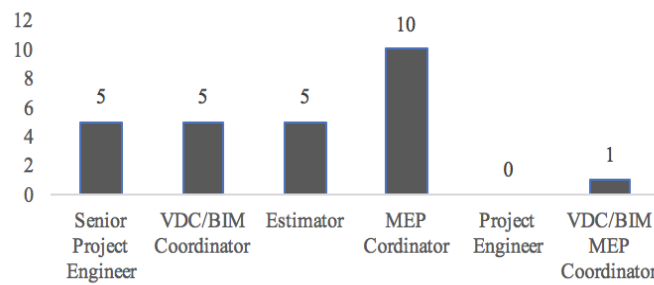


Figure 5: Experience requirements for open positions that require a four-year degree with a representative construction company

Years of Experience (Without Degree)

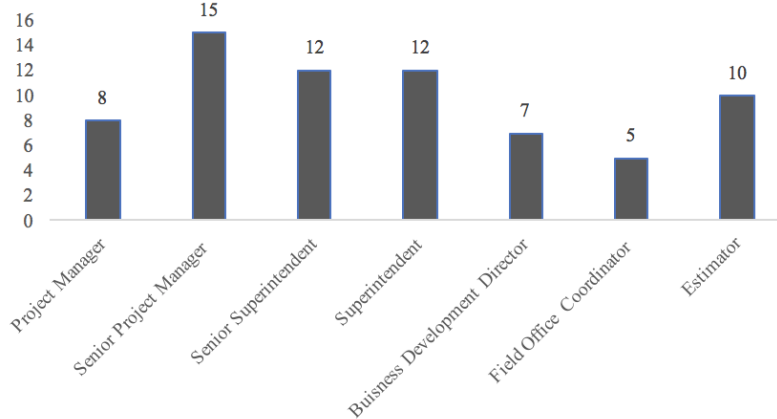


Figure 6: Experience requirements for open positions that do not require a four-year degree within a representative construction company

Average Years of Experience Required

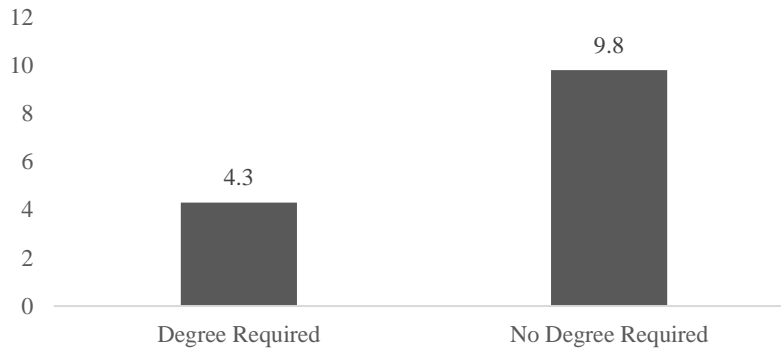


Figure 7: Average years of experience needed with a degree and without a degree to qualify for open positions in a representative construction company

Average Salary

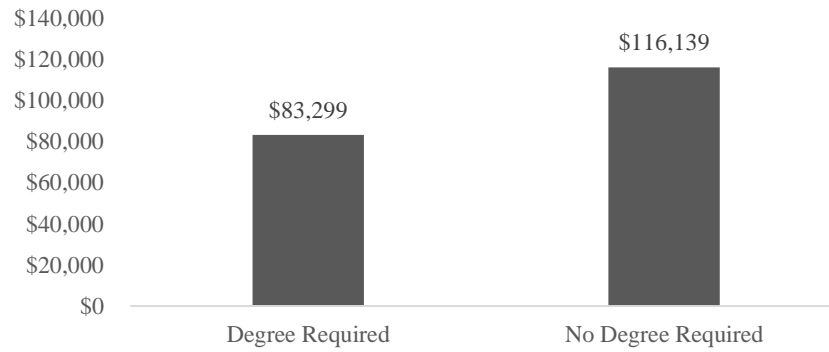


Figure 8: Average salary for jobs that require a degree and do not require a degree in a representative construction company

Average Salary for Each Open Position

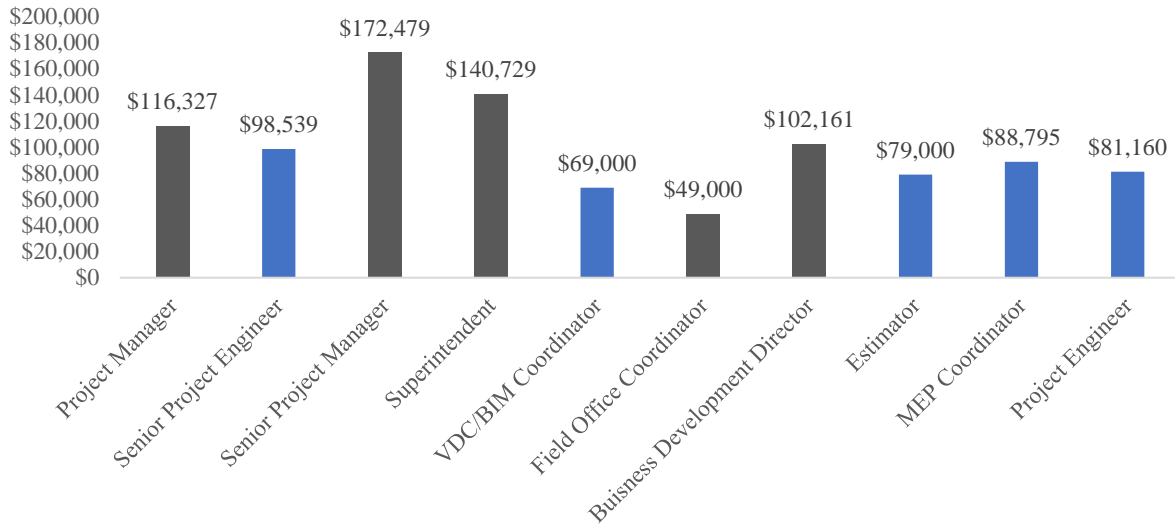


Figure 9: Average salary for open positions within a representative construction company. Blue represents open positions that require a degree. Black represents open positions that do not require a degree

Interviews Supporting Results

Based off of further research and information provided by Human Resources, the representative construction company is comprised of 300 nonunion employees and over 350 union craft workers that contribute to the self-performed work of the company. Most Project and Field Engineers in the company are hired from 4-year universities and are informed of career mobility through company informative sessions held on college campuses. The company as a whole is managed and lead by six individuals in various regions across California. These Project Executives all hold an applicable college degree in construction, as well as have multiple years of experience on a variety of different projects. Many Executives within the company, started with the company in entry level positions after completing college, and were able to continue climbing the ranks due to their experience and vast resumes of successful projects. As for education requirements, the Project and Field Engineer positions require a BA/BS which allows them to follow a route to eventually become a Vice President and sit on the Leadership Executive Board. However, for those in the trades, a college educational degree is not required to eventually work up to becoming a Superintendent.

In an interview with a Superintendent at a representative construction company, the individual explained his career background. After completing high school, he was unaware that a Construction Management degree could be pursued at a 4-year university. Instead, he began his career working within the trades as an insulator. He explained, "After high school, I started working as an insulator at the lowest rank [apprentice]." Interest in the trade side of construction began with his father who also worked in the trades as a carpenter. As for progressing through the trades, he explained how he eventually switched from an Insulator to a Carpenter Apprentice and began his program to eventually become a Journeyman. While working as a Carpenter Apprentice, he explained that the apprenticeship typically took four years to complete. However, it took him six years to finish due to the fact that in his 3rd period of the program he was being compensated as a Carpenter Foreman because of his advanced technical skill as a Carpenter. Today, he has accrued 5 years as a Superintendent for a representative construction company and is motivated to eventually become a Senior Superintendent. When asked about career advancement, specifically if he feels any type of limitation in career growth due to not obtaining a university degree, he explained, "I do not see any limitation to my career, as long as you have work experience and know how to build. I view my career as being untapped. I do however think that if I had a degree, that my progression to becoming a Superintendent or anything higher would have happened faster." He ended the interview by stating, "Construction is about character, there are those who want to be in the field because they enjoy building with their hands, and there are also people who prefer to learn the management required behind a successful project, it depends on which person you are."

Discussion

After considering the potential variables one can use the data provided to compare the weight that education and experience have on salary and accessibility of various positions at the representative construction company. The data shows that individuals who are not able to obtain a degree are not inhibited from gaining positions within the construction industry, so long as experience weighs heavier in lieu of higher education. This can be seen in the difference between the amount of experience required for positions which require a degree compared to those which a degree is merely preferred. A direct example of the experience factor increasing in lieu of education can be seen in comparing the Estimator position. Not having a university degree requires an additional 5 years to qualify for the same position. It is also important to note that although the open positions with no degree required, make up a majority of the open positions, those with degrees have access to all positions while those without only have access to 50%, unless they have a significant increase in experience. The interpretation is that individuals without a degree must not only compensate by experience but have less job opportunity across the board than those at similar experience levels. This might not indicate a definitive "ceiling" in career growth because an individual can substitute experience for lack of education. However, it does indicate a more complex relationship between education and career growth. If more experience is required to obtain higher job titles with no degree, the logical consequence is a slower rate of career growth. This is supported by the interview conducted with the Superintendent from the representative construction company. Although not having a degree will not inhibit him from developing his career, it will affect his rate of progression. In the long term, this still is not ideal for those who do not have access to higher education at a younger age. Utilizing the construction industry to point to education's impacts on career growth would be arguable be simple if a ceiling was easily identifiable. However, the rate of progression from one position

to the next is also a measure of healthy career growth. The exact difference in rate of career progression between individuals with different education levels would require further research, however the results from this study indicate a difference in rate regardless of the significance of its size. Therefore, education remains a factor long into career development.

Conclusion/Future Research

In conclusion, the aim of this study was to determine if there is a ceiling in career development for individuals without a university degree in the construction industry. This was necessary to identify whether factors that inhibit educational opportunity extend to career growth. A case study was done to analyze the availability and requirement differences in open positions relative to education level. An interview was conducted with a Superintendent at the representative construction company, which supported the interpretation of the results of the case study. Furthermore, information was gathered from Human Resources at the representative construction company which also supported this interpretation. The findings suggested that although there is no ceiling on career growth, the impacts of education carry on to long term career development in other ways. The average experience for those without a degree was significantly greater than for those with a degree, suggesting a slower rate of career development. Comparatively, a Construction Management degree allows individuals to progress in their career at a more rapid rate. While a “ceiling” is not the accurate term to define education’s impact on career growth, education does have an impact relative to rate of career development. It is suggested that further research be done on the rate of career development for individuals at different education levels, to continue the exploration of limiting factors on education extending to effects on long term careers in the construction industry.

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