

How Industrial Contractors are Handling Skilled Labor Shortages in the United States

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In the United States, industrial construction annually contributes around four percent to the GDP and has continuously increased this percentage year over year until the recent economic downturn. The construction industry requires a massive workforce and employs over seven million full-time and part-time employees. Out of those employees, approximately one million are employed within the industrial side of construction. Since the early 1980s, the U.S. construction industry has seen a severe shortage of skilled craft labor and even considering the current downturn this is expected to be long term issue. With a shortage of this magnitude the construction industry needs to look for ways to stem the tide and eventually reverse the trend. This study investigates programs being utilized by industrial contractors to help train and equip an increasingly unskilled labor force. Due to the precision required and skill required in industrial construction it is thought that their solutions may have a broader applicability.

Key Words: labor shortage, skilled labor, industrial construction

Introduction

The skilled craft shortage is not a shortage of workers. Rather, the Institute of Management and Administration ("IOMA") writes that, "it is a shortage of adequately trained, skilled, and productive workers available for certain jobs," (p. 6). With the construction industry requiring some of the most highly skilled workers to do some of the most dangerous jobs, replacement and recruitment proves to be difficult. Additional reasons for the shortage are a lack of training, an aging workforce, and an industry that doesn't appeal to many youth. According to Wang (2008), The Construction Labor Research Council predicts that "one hundred eighty five thousand new workers need to be attracted, trained, and retained each year up to 2016 in order for the industry to replace expected turnover and to sustain industry growth expectations," (p. 795). This study by Wang did not have the benefit of knowing the depth of the current economic downturn, but its conclusions are still applicable to long term issues.

The construction industry lacks appeal to young, potentially skilled workers. An increasingly poor image over the last couple of decades has discouraged young people from seeing the construction industry as a viable career path (Tucker, Haas, Glover, Alemany, Carley, Eickmann, Rodriguez, & Shields, 1999). Young people in today's society are being pushed towards college degrees and away from blue collar jobs. According to Carley, Goodrum, Haas, & Borchering (2003), "a lack of organizational investment and promotion opportunities by construction companies could also deter potential workers from construction jobs," (p. 374). The industry needs to invest more money in training new and current employees. Without training and opportunities to acquire new skills, the shortage of skilled craft labor will only grow. This being said, very little information is available concerning the ways industrial construction companies are addressing the problem.

The skilled labor shortage is not a new issue for the industry. Its effects have been felt for decades. The construction industry has had tremendous growth while still wrestling with significant workforce challenges (Whyte & Greene, n.d.). Any industry that depends on skilled craft labor is feeling the shortage (McConnell, 2007). Although there has been some statistical data published about the shortage of skilled labor, most of those reports strictly specify the number of workers needed to fill the gap. Little research has been done on the effect the shortage has had on industrial construction specifically. Likewise, little information is available about the steps companies are taking to mitigate the problem. The primary purpose of this study is to see what types of programs industrial contractors across the United States are implementing and participating in to mitigate the skilled labor shortage.

Methodology

Data was collected and analyzed to explore which programs industrial contractors are implementing in an effort to train skilled craft workers. This study identifies specific programs along with the effects those programs are having on the skilled labor shortage.

Interviews were conducted as initial exploratory research before sending out surveys. Interviewing professionals allowed the authors to pilot test the questions that appear in the final survey and obtain feedback from the respondents. Interviewing industrial construction executives unearthed new questions and ideas for the survey. Three industrial contracting executives were interviewed, focusing on the main themes of how their company has been affected by the labor shortage and what types of programs they're implementing to compensate for the shortage. The information obtained from these executives helped to shape the questions and the major themes of the survey.

After the interviews were completed, a survey was created and sent via zoomerang.com to around eighty industrial contractors. The survey respondents were taken from ENR's list of the top fifty industrial contractors along with an additional thirty contacts from small to midsize industrial contractors. The surveys produced twenty four complete responses with three partial responses, a thirty percent response rate. The purpose of the survey was to provide data on the shortage of trained skilled craftsman in industrial construction and to identify the most common and effective programs being implemented by companies today.

Results

The leading survey questions were structured to determine the demographics of the respondent pool. The survey was sent to companies that were known to be involved in industrial construction; however, since several different project types exist within industrial construction, we asked the respondents to identify the types of industrial construction they were engaged in. Responses indicate that 87% are involved with power, 57% do utility work, 52% do some manufacturing work, 39% are involved in hydro-carbon, 35% do infrastructure work, and 26% perform pulp and paper projects. Many of the responses suggest that these companies were involved in multiple areas of industrial construction. The next question asked the respondents how much of their revenue is derived from industrial construction. The majority (43%) of the respondents had revenue from industrial construction of over \$1 billion in the previous year. Of the respondents 22% had revenue between \$500 million and \$1 billion, and another 22% had between \$100 million and \$500 million in revenue from industrial construction the previous year. Of the respondents 13% reported less than \$100 million in revenue from industrial construction in the year prior. In other words, these contractors are engaged in many different sectors of industrial construction, and all are fairly large companies.

Of the 23 responses that said industrial construction was a material part of their business, twenty indicate that they employ skilled craftsman. The three responses that answered "no" to the question were disqualified and taken out of the study. This question was critical because the researchers wanted the industrial contractors' perspective to come from first-hand knowledge and experience. If they didn't regularly employ skilled labor, they would likely be reiterating what they may have heard from other contractors or subcontractors. Eighty-seven percent of the respondents report that they employ skilled craftsman within their company. After determining whether or not the respondents employed skilled labor, Question 7 asked the respondents to verify what types of skilled craftsman their company currently employs. Question 7 allowed respondents to select all responses that apply to their business. The four most common trades employed by the industrial contractors surveyed are: Welders (100%); Pipe fitters; Mechanical tradesman; Cement finishers (90%); Electricians (80%); Carpenters (80%); and Masons (45%).

Another early question asked the respondents whether they have experienced a shortage of skilled labor on a current project. Forty-five percent of the respondents indicated that had experienced a shortage of labor on a current project. Considering that this survey was issued in 2010 in the midst of a historic downturn within the construction industry, researchers found this result to be surprising. (see Figure 1.)

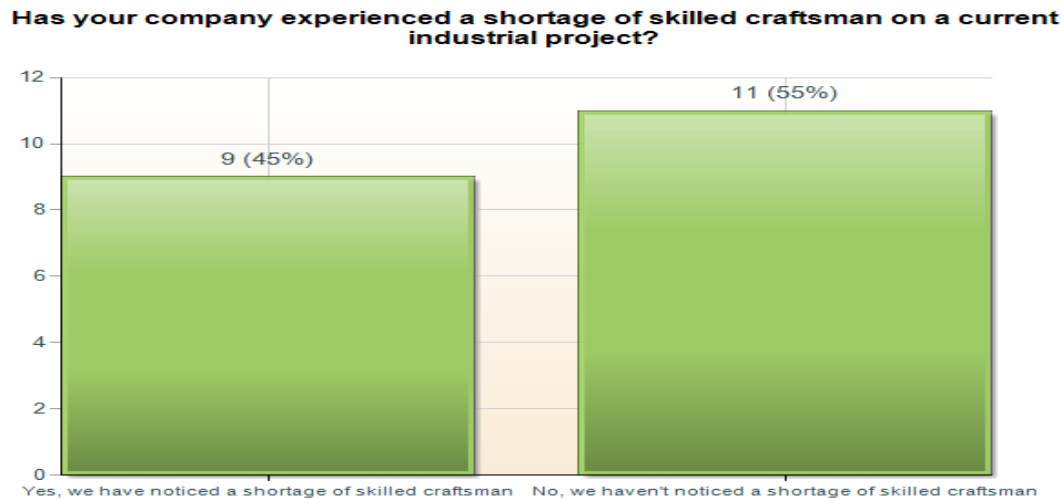


Figure 1: Shortage of craftsman

The next series of questions deals directly with the research objective which is to determine what types of programs and/or training industrial contractors are implementing to mitigate the skilled labor shortage. Initially, researchers sought to split the respondents into two groups: 1) those that train in-house and 2) those that out-sourced their training. The results from Figure 2 below show a significant preference (80%) to training their skilled craftsman in-house over out-sourcing the training.



Figure 2: Type of training used

In follow-up questioning, researchers sought to dig deeper into the specific programs utilized by the respondents who identified “in-house training” as the primary method they use to train skilled craftsman. The available responses for this question were determined primarily through interviews and prior research. According to Figure 3 below, the two most common in-house training techniques being used by industrial contractors are: (1) classroom based training (14, 88%), and (2) informal on-the-job training (13, 81%). These two choices were also the two main techniques used by two of the three industrial contractors who were interviewed before the survey. The third most frequently used in-house training technique is a structured, curriculum-based training program (10, 62%). The other industrial contractor interviewed was using the NCCER curriculum for classroom training. From the information seen below in Figure 3, it appears that industrial contractors are utilizing more than one method of in-house training. The other response category consisted of two responses: (1) the respondent was uncertain as to what type of in-

house training their company was providing and (2) the respondent's company was in the process of setting up the NCCER program curriculum.

What types of in-house training does your company use? (Please select all that apply)

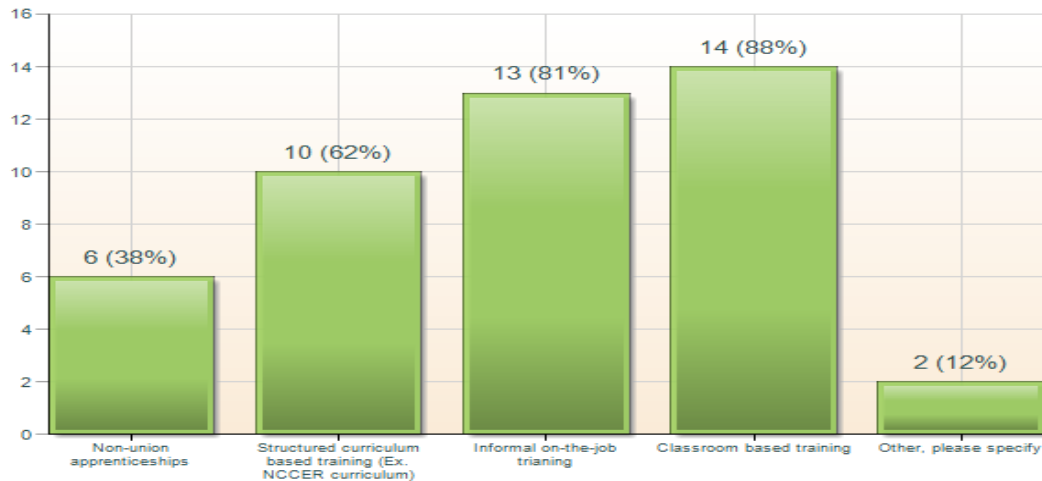


Figure 3: Types of in-house training used

As a follow-up question for the respondents who utilized out-sourced training, researchers asked for specifics about the types of programs they were engaged in. As Figure 4 shows, the majority (50%) of respondents who use an out-sourced training program report that their company funds vocational schools for their skilled labor force to attend. In the first interview conducted before the survey, the subject said that his company had provided funding for craftsman to attend vocational schools over the years; however, this wasn't a consistent activity the company would do. The company representative said that this was usually only done if a vocational school was near one of their jobsites and the project was a large job. In another interview, one of the companies employed union maintenance workers. The company didn't have to train the maintenance workers, because the union had its own structured apprenticeship program. The authors found the results seen in Figure 4 below somewhat surprising in that there was so little union activity mentioned by the respondents. This could be attributed to our limited respondent pool and possibly to a regional bias of the respondents. According to the data in Figure 3 and 4, it seems that today's industrial contractors are more comfortable training their skilled craftsman in-house utilizing programs tailored to their company's specific needs.

What types of out-sourced training does your company use? (Please select all that apply)

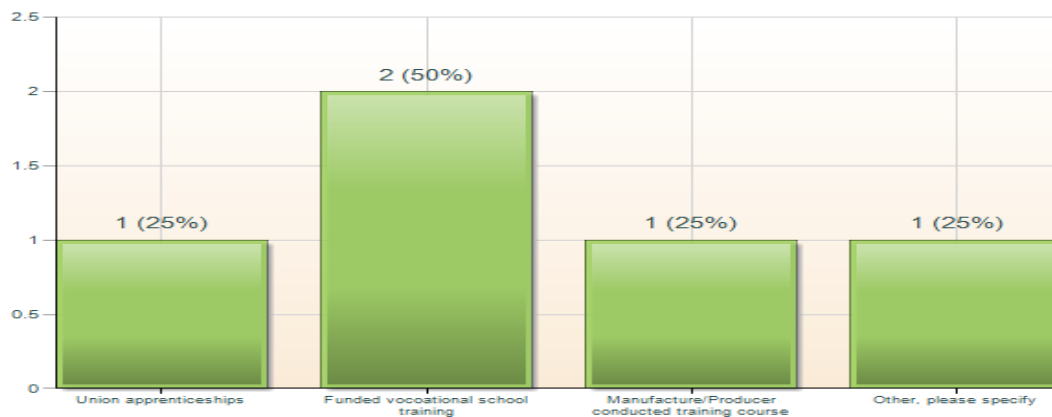


Figure 4: Types of out-sourced training used

During this study's initial research, it became apparent that companies failed to put a tremendous amount of effort into tracking the success rate of the training programs that they had implemented. Respondents were asked which metrics were being used to track the success of their company's training programs for skilled labor. The four answer choices provided in this question were derived from a combination of prior research and interviews conducted before the survey. It appears that industrial contractors employ a combination of three main metrics to measure the success of their skilled labor training efforts: (1) quality of work (15, 75%), (2) retention of skilled labor (10, 50%), and (3) the amount of time it takes for a skilled laborer who has received training to do their job (10, 50%).

The following question asked respondents who *did* track the success of their programs through some metric to rate the overall success of their company's training program. As seen in Figure 5 below, all those who track the success of their training programs have shown some level of success.

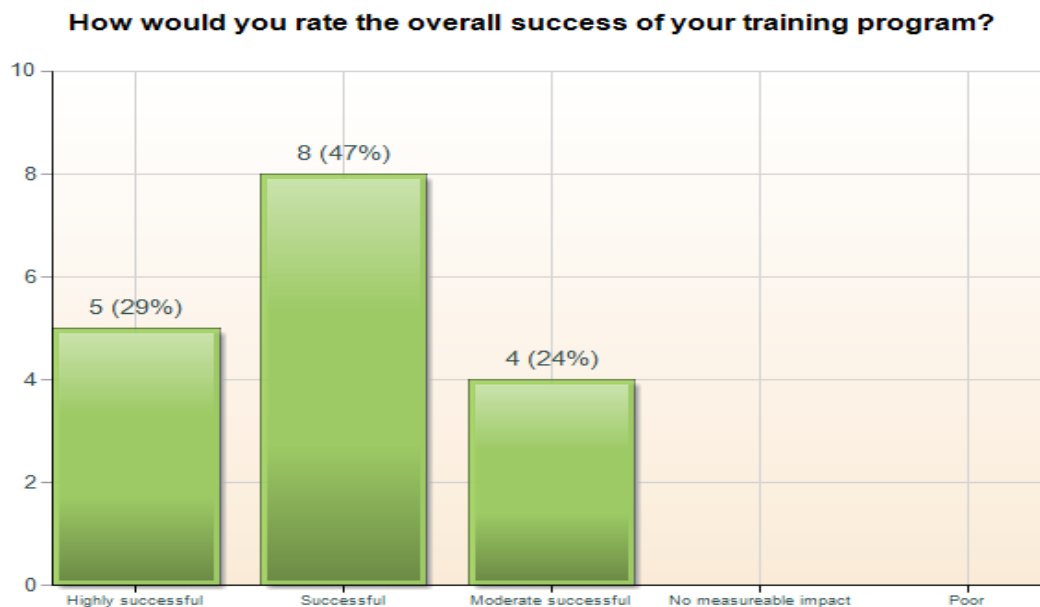


Figure 5: Measure of training success

Conclusions

The main objective of this research is to identify the types of programs industrial contractors in the United States are using to train and equip an unskilled labor force. The study was able to narrow down the methods of training to two main categories: 1) in-house training and 2) out-sourced training. Based on the results of this research, it is safe to say that in-house training is the preferred way industrial contractors use to equip unskilled workers. In fact, out of the twenty survey respondents who employ skilled labor, sixteen report their company uses in-house training to train their skilled craftsman. Both the personal interviews and the surveys conducted for this study concluded that classroom-based training and informal on-the-job training are the most commonly used in-house training methods. Some industrial contractors are also using a structured curriculum in their classroom-based training. The curriculum mentioned most by interviewees and survey respondents was the NCCER training curriculum. It is clear that industrial contractors are not utilizing just one of these methods; rather, they are using a combination of the programs mentioned above. One surprising result is the failure of the respondents to recognize the union as a primary source for training their skilled labor. Some of this apparent disparity may be related to the limited number of respondents and the need to expand on the current data to normalize regional bias. Although, as stated above, our limited data suggest that industrial contractors are moving toward in-house training programs and relying less on outside parties to train their skilled labor, it would also seem that the majority of industrial contractors are satisfied with the progress of their current training programs and generally feel they have been a success.

Industrial construction requires some of the most highly skilled workers within the construction industry. Diverse projects ranging from nuclear power plants and oil refineries to manufacturing plants and large utilities have some of the most exacting and stringent specifications found in the entire construction industry. Skilled labor is a necessity for industrial construction. Their challenging line of work demands the best. This research has explored the training and programs that are being implemented by industrial contractors with the thought that what works for industrial construction may be well suited for the broader construction industry.

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