

CONSTRUCTION LABOR SHORTAGE, CHALLENGES, AND SOLUTIONS: A SURVEY-BASED APPROACH

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The global construction industry contributes about 13% of the world's GDP and employs over 7% of the world's working population. Literature showed that the world's construction industry is highly dependent on skilled labor, labor productivity, and workmanship quality. According to industry experts, there is a significant shortage of labor for construction activities due to various reasons that delay construction activities and reduce construction efficiency. Although this was discussed in various forums in diverse communities, a sustainable solution for this challenge is not straightforward. Labor shortages are mainly due to unpredicted market fluctuations, a lack of specialized skill development programs and a lack of career progression paths. Implementing state-of-the-art technologies and construction automation can be considered potential solutions to reduce the need for labor forces in the construction industry. However, the initial investment required for automation and the technical know-how are key barriers to deploying construction automation in small to medium-scale construction companies. The aim of this study is to develop survey-based solutions to an existing labor shortage and provide a scientific framework to attract and retain construction labor. The findings of this research will benefit builders, contractors, and policymakers to observe labor market behaviors and proactively adapt to market fluctuations to attract and retain needed labor and also for the municipal, provincial, and national level decision-making on sustaining labor and developing new talents.

Keywords: Workforce development, Apprentices, Labor retention, Worker motivation.

1 INTRODUCTION

Construction labor shortage is a growing concern for the global construction industry. As the demand for construction services continues to increase, the availability of skilled and unskilled labor has become a critical issue, causing delays, increased costs, and reduced quality of construction projects. The construction labor market is a complex and dynamic field, and understanding the challenges and potential solutions requires a comprehensive approach. This paper presents a survey-based approach to understanding the current state of the construction labor market, with a focus on identifying the key labor-related problems and exploring potential solutions.

Previous research on the construction labor market has identified a number of challenges, including the shortage of skilled labor, the high turnover rate of workers, and the lack of training and development opportunities for workers. The findings of this research have highlighted the need for effective strategies to address these issues and improve the overall efficiency and competitiveness of the construction industry.

Despite the importance of this issue, there is still a significant research gap in the field of construction labor shortage. Much of the existing research has focused on identifying the problems associated with the shortage of labor, rather than exploring potential solutions that actually work. This study aims to fill this gap by surveying a wide range of stakeholders,

including construction workers, and employers, to gain a more comprehensive understanding of the current state of the construction labor market and the potential solutions that can be implemented to address the labor-related problems.

This study will be of particular interest to professionals and policymakers in the construction industry, as well as researchers and academics working in the field of labor economics. The findings of this study will provide valuable insights into the current state of the construction labor market and the potential solutions that can be implemented to improve the overall efficiency and competitiveness of the construction industry.

Through this research, we will attempt to discover what may be preventing new entrants from entering residential framing, and what can be done to retain them in order to increase the number of workers, worker skills, and their productivity so that residential construction sector may catch up to new home demand.

2 LITERATURE REVIEW

Previous research on the construction labor market has identified a number of challenges associated with shortage of labor. For example, studies have found that the shortage of skilled labor is a major concern for the construction industry, leading to delays and increased costs for construction projects (Martin and Stephen 2005).

Retiring baby boomers is causing a big loss in the industry. According to RSI, due to retirements and career changes, the industry loses 20,000 technicians each year (Buel 2022). Consequently, the resignation of the baby boomers leads to a significant skills gap because they carry with them a wealth of knowledge and decades of experience (Collins 2019). Contributing to the retiring baby boomers, there are not enough young people pursuing trades to replace retiring technicians and installers (Ridge 2020). Other research has identified that high turnover rates among construction workers lead to a lack of continuity and productivity in the construction process (Martin and Stephen 2005). Additionally, there is a lack of training and development opportunities for workers, which exacerbates the shortage of skilled labor (Ridge 2020). New technology and sustainable construction are minor reasons contributing to the labor shortage in the industry. The technology development speed is getting faster along with the high demand in Smart systems standing in the way of training skill labor (Ridge 2020).

To address these challenges, researchers have employed a variety of methods to explore potential solutions. For instance, some studies have used econometric methods to analyze the labor market for construction workers, focusing on factors such as wages and employment trends (Jackson 2022). Additionally, some studies have explored the role of technology in the construction industry and how it can be used to improve the productivity and efficiency of construction projects (Jackson 2022).

According to Build force (Forecast summary reports), changes in the residential labor force in Alberta will see a net deficit of 4,018 workers from 2020 to 2030. This is calculated from the hiring needs of new workers in that timeline, expected retirements, and the expected new entrants which will offset this.



Figure 1. Changes in the residential workforce (Buildforce 2022).

In summary, the literature review suggests that the shortage of labor is a major concern for the construction industry and that there are various factors that contribute to this problem. Researchers have used a variety of methods to explore potential solutions, but further research is needed to gain a more comprehensive understanding of the issue and to identify effective strategies for addressing the labor-related problems.

3 METHODOLOGY

The methodology employed in this research paper on the construction labor shortage, challenges, and solutions involved a survey-based approach divided into several phases.

Phase I: the survey sample was identified and selected. The sample included construction industry professionals, SAIT dual credit students, and high school students. The survey was distributed to a total of 100 participants.

Phase II: the survey questions were developed and reviewed by a panel of experts in the construction industry. The survey focused on gathering information about the current labor shortage, the challenges faced by the construction industry, and potential solutions.

Phase III: the survey was conducted, and data was collected. The survey was conducted online, and participants were given a deadline to complete the survey. Reminders were sent to non-responders to ensure a high response rate.

Phase IV: the data was filtered, and the information was analyzed. Descriptive statistics were used to summarize the data, and inferential statistics were used to determine any significant differences between the responses of different groups.

Phase V: the results were discussed and interpreted in the context of the research question. The findings were then used to develop recommendations for addressing the labor shortage and challenges faced by the construction industry.

Overall, the survey-based approach allowed us to gather a large amount of data from a representative sample of construction industry professionals. The data was then analyzed and used to provide a comprehensive understanding of the current labor shortage, the challenges faced by the industry, and potential solutions.

4 RESULTS AND DISCUSSION

The first key finding was that the majority of respondents reported experiencing labor shortage in the past year. Additionally, when asked about the specific challenges faced as a result of the labor shortage, the majority of respondents cited difficulty in finding qualified workers and increased labor costs as the top two challenges.

Table 1. Factors workers consider when selecting an employer.

Work Motivational Factors (Career Choices)					
	1st	2nd	3rd	4th	5th
Pay/Benefits	62%	19%	14%	5%	0%
Company Culture/ Co-workers	24%	24%	24%	29%	0%
Job Security	10%	29%	10%	19%	29%
Possibility of promotions/ clear career path	5%	24%	29%	24%	19%
Company ethics	0%	10%	14%	29%	24%

Each column shows how often (in percentage) each factor was ranked 1st, 2nd, 3rd, 4th or 5th. Once again, pay and benefits was at the top of the list with 62% of respondents ranking it as the most important thing. This was true across all ages and experience levels. Those who had over 8 years of experience were most likely to put pay and benefits as the most important with 80% putting it first. Those age 26-30 were least likely to put it first (although still the majority) with only 40% putting it first.

In order to address these challenges, a number of solutions were proposed by the respondents. The most frequently mentioned solutions were offering training and development programs, increasing wages and benefits, and recruiting from underrepresented groups.

When comparing and contrasting the applicability of these solutions, it was noted that offering training and development programs may be the most effective in the long-term, as it addresses the issue of a lack of qualified workers. However, increasing wages and benefits may be a more immediate solution to attract workers in the short-term. Recruiting from underrepresented groups may also be effective in addressing the labor shortage, as it addresses the issue of a lack of diversity within the industry.

Future research in this area could include studying the long-term effects of the proposed solutions and developing more specific strategies for recruiting from underrepresented groups. The benefits of resolving the labor shortage within the construction industry would not only be for the companies involved but also for the local communities and for the country. The labor shortage is a major hindrance for construction companies and addressing this problem would ensure smooth and timely completion of construction projects, leading to faster economic growth.

In summary, the results of this survey-based research have shown that the construction industry is currently facing a significant labor shortage, with the majority of respondents reporting difficulty in finding qualified workers and increased labor costs as the main challenges. A number of solutions have been proposed, including offering training and development programs, increasing wages and benefits, and recruiting from underrepresented groups. These solutions could be implemented to address the labor shortage and the challenges faced by the industry.

5 CONCLUSION

The reoccurring theme throughout almost all the survey questions was how important pay and benefits are. Since the majority of framing is done through sub-contracting, things like benefits are rare for a framer. This is clearly one of the main reasons people are not going into or staying in framing. As mentioned, we originally thought that the hard physical labor and stigmas attached to framing were the main deterrent, however, from the survey results we can see that there are plenty of people who are willing to do the work, as long as they are adequately compensated.

Based on initial workshops and discussions within research team and with developers' team, the initial plan to attract more workers to residential framing is a scholarship aimed at pre-employment carpentry students. However, after collecting and analyzing the data it was clear that this would not be the best solution because first, there was a low desire to enter residential construction in general from the carpentry students, and secondly, it was indicated by developer's framing partners that although carpentry students are skilled and can gain their apprenticeship hours in residential framing lacked necessary skill in the framing trade.

Based on this and other data collected, we have changed our recommendation to a 10-week training program that will be subsidized by developer because we feel that targeting this use of their capital will provide a greater return on investment as it will decrease the chance of losing carpenters to commercial construction as the intakes will only be students interested in residential framing. It will also have the secondary benefit of increasing productivity on site as students will leave the program with framing specific skills that will allow them to integrate into framing crews more seamlessly.

In addition to this, we also recommend implementing worker appreciation gestures to address the data collected which indicates that these small gestures add greatly to employee satisfaction. While the framers will not directly work for developer, but rather their industry framing partners, we feel that by developer taking this on, it will positively affect all trades on their sites and increase retention as well as moral which can lead to a higher quality product delivered to clients and increased productivity as the workers will feel appreciated.

Through the implementation of the above recommendations, we believe that this can address the immediate need of skilled framers to catch up on backlogged homes as well as the immediate future demand of developer and their framing partners. We also believe this will address the desire of the workers entering residential framing to see a potential career path in framing and beyond as well as addressing the company culture and worker appreciation that is one aspect of retention of the skilled workers.

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