

Analysis on the status quo of construction industry and workers' professional literacy

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Abstract. Under the background of the new building industrialization in China, the traditional cast-in-place construction mode begins to change to assembly construction mode. Such subversive changes make all regions face various assembly construction quality problems caused by traditional workers' lack of assembly construction knowledge, low awareness and unskilled operation. Therefore, improving workers' professional quality is very important to improve the quality of assembly construction. Through the analysis of a large number of domestic and foreign literature, this paper found that when studying prefabricated buildings from different dimensions such as quality, cost, schedule and safety, Will involve the "operation proficiency", "education level", "professional skills", "vocational training", "qualification", "working years", "professional experience", "lack of knowledge", "reputation", "professional pride", "mobile operation", "work attitude" and other aspects of the workers, These factors focus on safety awareness, operation norms, vocational training, work experience, professional knowledge, cultural level, quality awareness, technical skill level. All these factors will affect the quality of assembly construction, and the quality of workers is one of the reasons for poor construction performance, frequent safety accidents and low construction quality.

1 Instructions

In 2017, The General Office of the State Council issued "The opinions on Promoting the Sustainable and Healthy Development of the Construction Industry", pointed out the problems such as backward construction technology and low quality of workers. In the first half of 2021, the added value of the construction industry increased by 8.6 percent year-on-year, accounting for 6.26 percent of the country's GDP. By the end of June 2021, the number of construction enterprises with construction activities had reached 41.734 million, up 1.25 percent year-on-year. At present, China's urbanization development is facing a comprehensive transformation period of innovation-driven development. Construction industry recruitment demand increased 10.7% from 2020, among which skilled talent recruitment demand increased 10.9% from the previous year. In particular, the demand for assembly building design, production, construction and management personnel, BIM talents and intelligent building talents had increased significantly, and the market prospect for high-skilled applied talents of construction engineering specialty was broad. On the basis of the industrialization of construction, in November 2017, the Ministry of Housing and Urban-Rural Development of China issued a draft of the opinions on workers on "Training and Guiding Construction Workers in the New Era", pointing out that the skills and quality of construction workers should be effectively improved.

2 Quality development status of China's construction industry

At present, China's comprehensive national strength is in the rising, the national economic construction and rapid development, from construction nearly five years development statistical data analysis (Figure 1), the added value of construction industry in China in nearly five years still maintain rise but growth began to slow, this means that the scale of construction by the development of rapid expansion, is becoming a thing of the past, High quality and high efficiency will become the focus of future development. Large-scale and backward extensive operations and on-site wet operations have been gradually abandoned [1]. To keep up with the pace of industrialization and intelligent development, the construction industry should improve labor productivity, comprehensive economic benefits, overall personnel and technical management level, preliminary design and in-depth design level, energy consumption of engineering processing and production process, environmental protection capacity of construction site and other aspects [2]. This suggests that our country construction has entered a stage of high quality development, the future development direction of change in order to promote our country construction industrialization level of development, the developed countries construction labor productivity, to dare to chase propulsion with prefabricated construction as the technical features of

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new-type industrialization, achieve the traditional labor-intensive enterprises to intensive industry chain of industrialization.

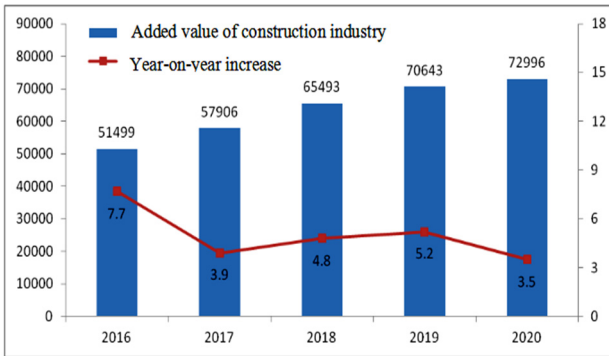


Figure1 Added value and growth rate of construction industry from 2016 to 2020
(Data source: 2020 National Economic and Social Development Bulletin)

Since 2016, prefabricated buildings had been thoroughly implemented in China (Figure 2). The newly started construction area of prefabricated buildings in China increased from 114 million square meters in 2016 to 630 million square meters in 2020, with an annual increase of nearly 50%. Its share of new floor space jumped from 4.9% in 2016 to 20.5% in 2020. However, due to the relatively short time of the introduction and used of prefabricated buildings, the construction industry had insufficient grasp of its technology, leading to the current many construction industry to implement prefabricated buildings with traditional buildings, which led to prefabricated buildings in the design, production, construction and other links there were many quality problems. For example, in the process of component production, the connection of embedded pipelines within the components is prone to quality deviation, and the interface between embedded pipelines is not properly handled, resulting in incomplete sealing [3]. In the construction process, the lack of full grouting is the most prominent problem [4]. The dislocation of the connected sleeve is also one of the more important invisible defects. In addition, because the construction site practitioners lack of management of finished products or its attention is not enough to produce improper quality problems such as product protection.

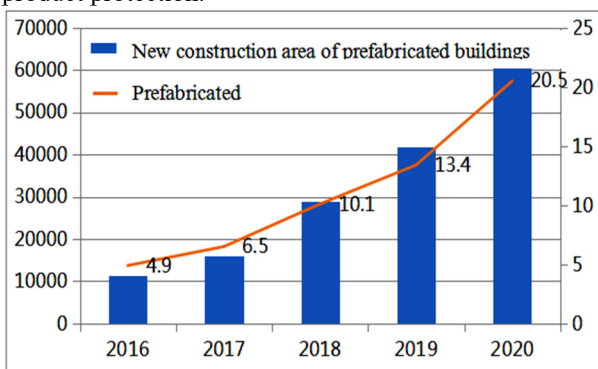


Figure2 New construction area and proportion of prefabricated buildings in China from 2016 to 2020
(Data source: Research Institute of Forward-looking Industry, Ministry of Housing and Urban-Rural Development)

3 Status quo of Chinese workers' professional literacy

Based on the industrialization development of new building, the low quality of workers' vocational skills was the main factor that restricts the sustainable and healthy development of construction industry. There was a serious shortage of front-line operators for existing workers who were able to engage in prefabricated buildings, and the low technical skills and comprehensive professional quality of key components such as lifting and joint construction had become the "choking" problem of prefabricated buildings [5]. In the field of workers, there was a serious shortage of high-quality innovative technical talents with craftsman spirit who could combine technology, economy and management.

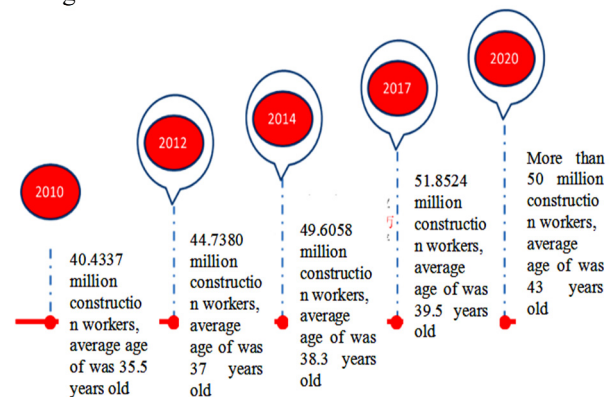


Figure3 Number and age of construction employees in 2010-2020
(Data source: China Construction Industry Association)

Most projects currently in the process of building a severe lack of their own professional team work assignments, much depends on the local contractor or mobile operation construction group, multiple levels of its personnel basically is the age of 40 to 60 years old age range of migrant workers (Figure3), in 2020, Front-line workers of building construction work the crowd with an average age of 43 years old. The age groups of migrant workers due to the economic pressure to engage in this industry. first of all, due to the effect of construction industry in vulgar operation mode, the one-sided pursuit of progress, and requirements for engineering quality is not high, influence the workers only pursue quantity rather than the pursuit of quality, secondly is influenced by the social education, living environment quality, relative knowledge level is not high; Quality awareness and safety awareness is not high; Without systematic professional learning, most of them can only achieve basic operating skills; As I have been doing repetitive work for a long time, and as I get older, the phenomenon of solidified thinking becomes more and more serious, which leads to the inability to communicate with new technologies, new knowledge and new methods, and the difficulty to accept new working modes. Therefore, my overall professional accomplishment is low. All these problems indicate that workers, the basic human level, must be reformed in terms of improving professional literacy and build a group of high-quality and skilled workers, so as to adapt to the high-quality development of the construction industry

transformation.

4 Analysis of the influence of Workers' professional quality on prefabricated building quality

The development of prefabricated building is imperative. The working capacity of workers in the traditional extensive operating environment cannot match it. Prefabricated building components need workers to do fine work in production, production, transportation and other links, otherwise they may not be able to proceed normally in the construction and installation stage. Quality problems caused by workers' professional knowledge, work attitude, quality awareness, safety awareness, non-standard operation and other professional qualities are not high and many factors are more common and significant.

Through literature review and the use of work logs, quality inspection, stand-by and communication with technical personnel in the daily management of engineering projects, this study found that the construction quality of prefabricated buildings in the construction process is mostly related to the low professional literacy of workers.

Domestic and foreign literature on the impact of workers' professional literacy on the quality of prefabricated construction is relatively scattered, and direct research on the impact of workers on the quality of prefabricated construction is relatively scarce. This study is mainly based on the retrieval of CNKI database. From 148 literatures, it is found that domestic researches on workers and construction quality are mainly reflected in the analysis of construction workers' safety consciousness and construction project quality management. There is no separate discussion and research on the influencing factors of workers' professional literacy on the quality of prefabricated construction, but the importance of workers is recognized by many scholars. Many scholars have mentioned the construction quality problems caused by the low quality of workers. Many researchers have pointed out that the main improper products observed on construction sites are caused by human error. Of the 200 problematic products examined at 50 sites across the UK, 45% were due to negligence; About half are due to lack of knowledge or experience. In the analysis and induction of domestic research results, this study tries to correlate workers' occupational literacy with prefabricated construction quality, and extracts the influencing factors of workers' occupational literacy on prefabricated construction quality.

Through research data at home and abroad, it is found that when prefabricated buildings are studied from different dimensions such as quality, cost, schedule and safety, Will involve the "operation proficiency", "education level", "professional skills", "vocational training", "qualification", "working years", "professional experience", "lack of knowledge", "reputation", "professional pride", "mobile operation", "work attitude" and other aspects of the workers, These factors focus on safety awareness, operation norms, vocational training, work experience, professional knowledge, cultural level,

quality awareness, cost awareness and technical skill level. All these factors will affect the quality of assembly construction, and the quality of workers is one of the reasons for poor construction performance, frequent safety accidents and low construction quality.

5 Conclusion

Starting from the construction quality and based on the high quality development of prefabricated buildings, this study finds out the factors influencing workers' professional literacy, and discovers the key factors that can improve prefabricated construction quality. The model analyzes the relationship between workers' professional literacy and prefabricated construction quality, and the conclusion of empirical theoretical analysis. In the process of human resource management of workers in construction production enterprises and construction enterprises, suggestions are put forward to strengthen workers' professional quality and cultivate working teams with craftsman spirit. It provides reference for improving the quality of assembly construction fundamentally from the manpower of workers, and provides basis for workers to improve their professional quality.

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