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Factors Affecting Quality of Workmanship in Building Construction

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Abstract

A successful construction project requires synonymous efforts from all involved parties in the entire complicated stages, from designing, approving, supervising, and constructing the building. Nevertheless, in recent years, it is becoming more common to see poor quality in construction projects. Findings from the previous research have identified several variables that contribute to this poor workmanship in building constructions. This predicament originates from various crucial parts of the project including the management, subcontractors, labour, equipment, weather, and time. This study aims to identify specific factors affecting the workmanship quality in building construction in Perak, as well as to rank the factors from the most significant to the least significant that lead to poor workmanship. To fulfill the goals of this study, 157 online surveys were distributed to site supervisors from different construction sites in Perak. The data was analyzed and all factors were ranked based on the average index and frequency analysis. Results indicated that the lack of experience and competency of labour is the most significant factor overall, followed by poor project management and time limitation. Thus, it is recommended for construction management to put all these factors into consideration for better workmanship in building construction in the future.

Keywords: Quality, Workmanship, Building, Construction, Construction Industry

Introduction

It is undeniable that defects may occur in the construction of building and these defects can be detected while the construction is still in progress. Close supervision is required when workers are performing their jobs. In addition, it is very important that a trained workforce is utilized to carry out the jobs involved from inception up to completion. The quality, cost, and time of a building construction is highly dependent on workmanship (Fromsa et al., 2020). Workmanship can be described as a human attribute relating to knowledge and skill at performing a task. Workmanship can also be defined as “the quality of work that is done by a

concerned person” (Thamilarasuet al., 2017). Besides, workmanship is not a fixed concept. Rather, there are a lot of different views on how to define what workmanship truly is. As an example, David Pye, Professor of Furniture Design at The Royal College of Art, defined workmanship as 'the quality of the execution of a design'. The closer the final product is to the design in terms of look, quality of material, and quality of construction, the better its workmanship is.

According to Lim (2020), the Federal Territories Minister, Tan Sri Annuar Musa, visited the Malaysia Civil Servant Housing Programme (PPAM) Melinjau in Precinct 11, Putrajaya, after receiving numerous complaints regarding the poor workmanship of the residential units. He said, “although the housing is at a lower cost, that should not be an excuse for the developer to deliver such poor workmanship”. Supervision of development projects should be done while the construction is ongoing, not three years after the project is completed.

Considering the issue experiencing by many construction projects, the objectives of this paper are:

- to identify specific factors affecting the workmanship quality in building construction in Perak,
- to rank these factors from the most significant to the least significant that lead to poor workmanship. Dah bullet kan

Factors Affecting the Quality of Workmanship

There is some previous research done about the factors affecting the quality of workmanship in building construction. Based on the literature review Ali and Wen (2011) studied the factors contributing to poor workmanship and possible measures to minimize the problem in Malaysia. They found that the lack of experience and competency of labors, language barrier in communication and lack of communication, unsuitable construction equipment, poor weather conditions, as well as limited time and cost were the causes of poor workmanship. In addition, Keng and Hamzah (2011) stated that workmanship is classified as one of the most frequent non-conformances in construction sites. Furthermore, in the literature, eight variables that were related to the causes of poor quality of workmanship in construction projects had been discovered.

Poor Project Management

Management is generally recognized as a key factor in poor construction quality. Management factors include insufficient oversight on site. In addition, poor supervision of the site also contributes to poor workmanship during construction, and this can be seen in many occasions on site. Besides, Dai et al (2009) added that management capabilities, especially at construction sites, are important as they are a major factor that affects the daily productivity of workers. Therefore, poor project management is one of the factors contributing to poor workmanship quality.

Complicated Role of Subcontractor

Othman and Mydin (2014) stated that the role of subcontractor is one of the factors contributing to construction deficiency (poor workmanship), though this factor is often dismissed. As a matter of fact, the role of subcontractor is important in construction work. This is because the main contractor only focuses on the management and coordination of the

construction, so almost 90% of the site work is completed by subcontractors, like drainage, sewerage, roadwork, and others. Besides, Othman stated that because of the involvement of various types of subcontractors in the same construction project, it is difficult for the main contractor to inspect, supervise and control the work that have been done by the subcontractors and this complicates the role of the subcontractor in construction projects, which can contribute to poor workmanship.

Lack of Experience and Competency of Labors

Skilled labor is a segment of the workforce that has specialized knowledge, training, and experience in performing physical or mental tasks that are more complex than routine work. Skilled workers are generally characterized by higher education qualification, higher level of expertise achieved through training and experience, as well as higher wages. However, contractors nowadays usually use foreign labors as manpower to construct a building, so that the cost can be reduced and work can be finished faster.

As a result, it will affect the quality of workmanship, as noted by Othman and Mydin (2014), who stated that the lack of experience and competency of the labors must be considered as a factor that contributes to poor workmanship as “productivity cannot be achieved through speed and hard work only without adopting better work practices”. Balvin Kaur wrote in New Straits Times that Jobs Malaysia director, Mustafa Kamal Bawaihi, said that employers usually prioritize experience rather than academic qualification or talent when employing workers. This is because experience is very important in reducing mistake and producing the best quality work. Similarly, the research done by Fromsa, Ararsa and Emer (2020) concluded that the primary reasons for poor workmanship are the lack of training and experience of the workers.

Language Barrier in Communication and Lack of Communication

The difference in language usage between the foreign workforce and the local supervisor may cause communication failure on site. This is because many foreign workers cannot speak the local language fluently. This in turn causes misunderstandings among the workforce in terms of their scope of work and subsequently leads to poor quality of work. Shafii, Musa and Ghazali (2009) stated that the existence of communication problem among foreign workers in the construction industry have contributed towards the accident risk at construction sites. This clearly shows that communication and language are very important, especially between local and foreign workers. Joy (2014) found that the lack of communication will reduce the quality of work done. It was suggested that proper inspection throughout the working time will increase workmanship quality and reduce the need for rework.

Unsuitable Construction Equipment

Choosing the right type and size of construction equipment often affects the quality of work. Randunupura et al (2013) reported that poor management of plant and equipment may be a considerable reason behind poor workmanship quality. It can be noted that with the right construction equipment, good results can be achieved, especially since the construction of buildings demands the best work quality assurance. For example, while the construction work is being carried out, the supervisor needs to make sure that the labors use the right equipment to avoid any defect appearing after the building has been occupied. Therefore, it is important for site managers and construction planners to identify the key features of the

types of equipment that are often used in construction. This is supported by the research done by Johari and Jha (2019); Fromsa et al (2020), where it was established that the lack of tools and equipment will contribute to poor workmanship in construction sites.

Poor Weather Condition

It is well known that weather has a negative effect on construction productivity (Larsson & Rudberg, 2021). In Malaysia, it is commonly known that November and December represent the raining season. Most of the states often face flood issues, including Terengganu and Kelantan. In December 2021, Selangor also experienced major floods. Recently, it is hard to predict the weather condition. Depending on the location, the season may bring rainy weather, followed by a dry summer. Fall and winter bring cooler temperatures, snow, and ice. Each of these conditions can be harmful to the materials and machinery used and affect the quality of workmanship.

Other researchers found that the hot and severe climate of Saudi Arabia during summer makes it very difficult for some of the construction works to be carried out, such as concreting. This is supported by Dai et al (2009), who stated that extreme climate condition is one of the factors that affects the construction labors' productivity and workmanship. Besides, according to the study, 45% of all construction activities were affected to some degree by the weather, resulting in substantial additional costs that can run into billions of dollars annually. This shows that weather condition can also impact the quality of the work in the construction of a building.

Limited Time

During the construction period, there may be many problems that cannot be resolved on schedule, so the contractors ask the workforce to complete the tasks quickly, thus resulting in poor work quality. Contractors do this to complete the work on time according to the project schedule to avoid Liquidated Ascertained Damages (LAD). Ali and Wen (2011) stated that insufficient time causes construction projects to be executed in a rush. As a result, the deficiency of workmanship will happen. In short, the limited time available can cause low quality workmanship in construction.

Labor Welfare

The quality of workmanship is also influenced by employer negligence regarding employee welfare. For example, employee wages that are paid late or not paid properly will reduce employee motivation and adversely impact the work they are doing. This may be because most of the workers come from overseas. Therefore, they need their salary on time to support their distant family. According to the Employment Act (1955), every employer shall pay the wages to each of their employees not later than the seventh day after the last day of any wage period, less lawful deductions earned by the employee during such wage period.

Methodology

Generally, there are two main sources of data collection, which are primary data and secondary data. The combination of data from these two sources will have a big impact on the results and achievement of the objectives of the research. Questionnaire was used as the research tool in getting the primary data. A total of 157 questionnaires were distributed to the respondents. The questionnaires were distributed to the site supervisors. The research area covered the ongoing residential construction projects around Seri Iskandar, Batu Gajah

and Ipoh, Perak. The questionnaire was divided into two sections, which were Part A - Demographic of respondents and Part B - Factors affecting the quality of workmanship. The secondary data is the data that is acquired before the research is carried out. It is very important to help provide a better understanding of the research that is carried out. The data is collected by reviewing books and other secondary sources of information such as online articles, journals, and news.

All the data collected was assembled and analyzed to ensure that it was related to the objectives. Then, the data was processed and analyzed by using Statistical Package Social Science (SPSS) Version 24.0. This software is beneficial to the researcher because it is a powerful statistical analysis software, easy to be used, and equipped with descriptive menus. After the data was assembled and appropriately analyzed, the percentage method was used to compare the results and findings with the objectives and scope of the research. Tables and charts will be presented for the factors affecting the quality of workmanship.

The data obtained from part A was analyzed in percentage. The purpose of this part is to determine the background of the respondents, which can help in analyzing whether the differences in background of each respondent can influence this research. The data from the respondents in Part B was analyzed by using the average index calculation method (Ahmad et al., 2013). This method was chosen to reveal the factors affecting the quality of workmanship and to determine effective ways to enhance the quality of workmanship. The analysis had ranked the factors based on the average index and frequency analysis.

Findings

The questionnaires were distributed through Google Forms. 157 respondents participated in this research. The result from the questionnaire is following. Part A, in terms of gender, there were 110 male participants and 47 female participants. There was a major difference between the number of male staff and female staff involved in this study. Most respondents in this study were below 25 years old (39.5%) and the lowest percentage of respondents who answered the questionnaire was those who were above 35 years old (29.3%). This result shows that it is difficult to obtain response from the contractors who are above 35 years old for this questionnaire. This may be because they have more commitment to be handled or they lack the time to answer the questionnaire. The percentage presented above is influenced by the fact that most of the respondents were fresh graduates and new young workers who were recruited into the contractor company. Most of the type of project that the respondents were involved with in their past project was residential project (n=157, 49%) and the type of project with the lowest percentage was industrial project (n=157, 13%). This shows that most of the respondents were involved in residential project in their past project.

Table 1

Factors Affecting the Quality of Workmanship

Level of Effectiveness		Strongly Disagree	Disagree	Agree	Strongly Agree	Total	Average Index	Rank
Respondents Frequency		<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>		
F1	Poor Project Management	5	31	71	50	157	3.06	2
F2	Complicated Role of Subcontractor	9	35	67	46	157	2.96	4
F3	Lack of Experience and Competency of Labors	5	23	77	52	157	3.12	1
F4	Language Barrier in Communication and Lack of Communication	9	35	75	38	157	2.90	5
F5	Unsuitable Construction Equipment	12	59	61	25	157	2.63	8
F6	Poor Weather Condition	14	59	61	25	157	2.89	6
F7	Limited Time	7	30	77	43	157	2.99	3
F8	Labor Welfare	11	38	77	31	157	2.82	7

Referring to the table 1, there are eight (8) factors affecting the quality of workmanship in building construction in Perak. The average index score of 3.12 for the lack of experience and competency of labors was the highest index among all the factors, which falls in the range of the scale rating between 2.50 and 3.50. It is followed by poor project management at 3.06, which is still included in the range of the scale rating between 2.50 and 3.50. This implies that the respondents of this research also agreed that this factor was a cause of poor workmanship in building construction.

Next, the third factor that affects the quality of workmanship is the limited time during construction, which scored an average index of 2.99, followed by the complicated role of subcontractor at 2.96, as well as the language barrier in communication and lack of communication at 2.90. Then, these factors are followed by poor weather condition at 2.89, labor welfare at 2.82 and lastly, unsuitable construction equipment with the score of 2.63. All in all, the data shows that all the respondents in this research agreed that the lack of experience and competency of labors were the main factors affecting the quality of workmanship in the building construction in Perak. The majority of the respondents faced the same problem, where the labors cannot do their work if they do not have the experience or skills that are needed.

From the previous research, there were a lot of factors that affected the quality of workmanship in building construction and some researchers stated that all of these factors can lead to building defects in the future. The quality of workmanship is very important, as stated by Thamilarasu, Rajprasad and Pavan (2017), where workmanship with higher

standards is said to be a positive and humanistic approach to productive management that is designed to bring together all levels of the workforce and experience in an organization in the setting of standards of excellence and achieving better outcomes.

Conclusion

In terms of the practical implications, this research has contributed meaningfully to the body of knowledge. This study has shown that construction sites in Perak are also experiencing similar problems as their counterparts in the other states. This research revealed eight factors that contributed to the declining quality of workmanship in many construction sites in our country. Of all these problems, for Perak, lack of experience and competency of labour is the most significant contributor to the poor quality of construction projects, followed by ineffective management of the project, and finally time shortage. These factors should be taken seriously because if they are left unchecked, there is a possibility that defects in finished construction projects will become even worse in the future and may pose safety risks to the public. Therefore, it is imperative for construction management to put all these factors into consideration for better workmanship in building construction in the future. To sum up the similar research findings is done in other states with larger sample of population, as well as further research is undertaken to understand the other parties' views and experiences, including subcontractors and labour. This contextual contribution will help in understanding the real issue and in finding solution for the crisis of poor workmanship in building constructions.

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