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PERCEPTIONS OF SKILLED LABOUR ATTRIBUTES INFLUENCING CONSTRUCTION DELAYS IN EMERGING ECONOMIES: EVIDENCE FROM PAKISTAN

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Abstract
Delays in construction projects are a persistent issue in Pakistan's construction industry and significantly affect project cost, quality, and overall performance. Among the various factors contributing to these delays, skilled labour attributes play a crucial role, as construction activities largely depend on the efficiency, competence, and coordination of skilled workers. This study aims to examine the perceptions of construction professionals regarding the impact of skilled labour attributes on delays in construction projects in Pakistan. The key labour attributes examined in this study include technical skills, work experience, communication skills, work ethics, teamwork, adaptability, and safety awareness. A quantitative research approach was adopted to achieve the objectives of the study. Data were collected through a structured questionnaire administered to contractors, consultants, site engineers, and project managers involved in building and infrastructure projects across major cities of Pakistan. Descriptive statistical analysis was employed to evaluate the relative importance of different skilled labour attributes in contributing to construction delays. The findings indicate that inadequate technical skills and insufficient experience among skilled workers are perceived as the most critical factors leading to project delays. Poor communication between skilled labour and site management, along with weak work ethics such as absenteeism and lack of commitment, were also identified as major contributors to schedule overruns. Furthermore, limited safety awareness and low adaptability to changing site conditions were found to indirectly influence delays by increasing the likelihood of accidents, rework, and work stoppages. The study concludes that enhancing skilled labour attributes through structured training programs, improved supervision, and effective labour management practices can significantly reduce delays in construction projects. The results provide valuable insights for construction organizations and policymakers aiming to improve project delivery and minimize delays in Pakistan's construction sector.
Keywords: *Skilled labour, Construction delays, Labour attributes, Project performance, Construction industry, Pakistan*

Introduction

The construction industry is widely recognized as a cornerstone of economic growth and infrastructure development in Pakistan, contributing substantially to employment generation and the delivery of essential facilities such as housing, roads, bridges, and public buildings (Sarwar, Lodhi, Khan, & Ali, 2021; Rashid et al., 2020). Despite its strategic importance, the sector continues to face persistent challenges, with project delays emerging as a critical impediment to project success. Construction delays often result in cost escalations, reduced

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quality, disputes among stakeholders, and diminished overall project performance (Aibinu & Jagboro, 2002; Sambasivan & Soon, 2007; Latif et al., 2023). Delays in construction practices are pervasive globally and have been widely studied due to their cost and schedule impacts (Memon, Memon, Khahro, & Javed, 2023).

Construction delay generally refers to the failure to complete project activities within the timeframes stipulated in contracts or agreed schedules (Assaf & Al Hejji, 2006; Latif et al., 2023). Prior research has identified numerous causes of delays, including inadequate planning, financial difficulties, frequent design revisions, material shortages, and weak project management practices (Doloi et al., 2012; Sohu, Chandio, & Mulh, 2019; Rashid et al., 2020; Latif et al., 2023). In addition, factors such as poor site management, delays in material supply, and insufficient supervision have also been found to contribute to time overruns (Haseeb et al., 2011; Memon, Memon, Khahro, & Javed, 2023). However, recent studies emphasize that workforce related issues, especially those associated with skilled labour, play an equally important role in affecting project timelines (Jarkas & Bitar, 2012; Latif et al., 2023).

In Pakistan, the construction workforce largely depends on informal skill development, where workers acquire competencies through on site experience rather than structured training or formal certification systems (Ahmed, Ali, & Nafees, (2018). This informal approach often results in inconsistent skill levels and varying work quality, which contributes to poor workmanship, rework, and low productivity (Musarat, Alaloul, & Liew, (2021). Practically, insufficient technical skills and limited experience among workers significantly impede the efficiency of construction activities (Latif et al., 2023). Shortages in technically qualified personnel and inadequately trained labour have been identified as noteworthy delay drivers in construction projects internationally (Nadeem et al., 2023; Sweis et al., 2007).

Skilled labour attributes—including technical competence, work experience, communication skills, teamwork, adaptability, and safety awareness—are essential for maintaining productivity on construction sites. Workers with strong technical capabilities and adequate experience perform tasks more efficiently and reduce errors, while effective interpersonal communication and teamwork enhance coordination among trades (Homthong, Moungnoi, & Charoenngam, (2024); Hwang et al., 2015). Furthermore, safety awareness indirectly impacts project performance, as accidents and unsafe practices can lead to work stoppages and schedule overruns (Tam, Zeng, & Deng, 2011). Research also suggests that labour shortages reflect technical skill gaps that negatively affect overall project performance (Baloyi & Bekker, 2011; Karimi et al., 2017).

Although prior studies have examined general causes of construction delays, limited research focuses specifically on construction professionals' perceptions of skilled labour attributes and their role in delays, particularly within Pakistan (Latif et al., 2023; Riaz, Ahmed, & Javed, 2020). Most existing research emphasizes financial and managerial factors, often overlooking labour related characteristics (Sohu, Chandio, & Mulh, 2019; Rashid et al., 2020). Therefore, this study seeks to analyze construction professionals' perceptions of the impact of skilled labour attributes on delays in construction projects in Pakistan. A deeper understanding of these perceptions can help identify key labour related issues and support strategies to improve workforce performance and reduce project delays.

Research Objectives

- To examine the impact of skilled labour attributes on delays in construction projects in Pakistan.
- To explore strategies for enhancing skilled labour performance to reduce construction delays and improve project outcomes.

Hypotheses

1. Skilled labour attributes have a significant effect on delays in construction projects in Pakistan.
2. Improving skilled labour attributes through structured training and supervision reduces construction delays and enhances project performance.

Research Questions

1. How do skilled labour attributes influence delays in construction projects in Pakistan?

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2. What strategies can be implemented to enhance skilled labour performance and minimize construction delays?

This study is significant as it provides actionable insights for construction managers, contractors, and policymakers aiming to enhance labour productivity and reduce project delays (Sarwar, Lodhi, Khan, & Ali, (2021); Latif, Saleem, & Cheema, 2023). The findings can inform the development of targeted training programs, certification systems, and labour management policies specifically tailored to Pakistan's construction sector (Ahmed et al., 2018; Sarwar, Lodhi, Khan, & Ali, 2021; Musarat, Alaloul, & Liew, 2021). Furthermore, the study addresses a gap in existing literature by systematically examining skilled labour attributes and their perceived impact on construction delays (Riaz et al., 2020; Sohu, Chandio, & Mulh, 2019). By identifying strategies to mitigate delays, this research contributes to cost savings, improved project efficiency, and enhanced stakeholder confidence (Aibinu & Jagboro, 2002; Sambasivan & Soon, 2007). Additionally, it underscores the importance of structured skill development, effective teamwork, and safety awareness, which are critical factors for the sustainable growth and competitiveness of Pakistan's construction industry (Homthong, Moungnoi, & Charoenngam, (2024); Tam, Zeng, & Deng, 2011).

Literature Review

Construction project delays have been recognized as a major challenge worldwide. Sambasivan and Soon (2007) highlighted that delays frequently occur due to a combination of management, resource, and external factors, affecting performance and cost effectiveness. In Malaysia, earlier empirical work found that causes such as financial issues, poor supervision, and material shortages were primary contributors to construction delays (Alaghbari et al., 2007; discussed in Rahman et al., 2020). Similarly, research in Pakistan has shown that poor planning, design changes, and labour issues are significant issues in project execution (Latif, Saleem & Cheema, 2023). In Pakistan, public sector projects including university and infrastructure developments often experience significant time overruns because of a combination of administrative delays, contractor inefficiencies, and labour problems (Sarhad University researchers, 2023). Construction research in sustainability contexts also notes that delays negatively affect the socio-economic conditions of communities, especially in rural regions reliant on infrastructure development (Rural Pakistan study, 2017). Although many studies have identified broad causes of delays, few focus specifically on labour characteristics that influence project timelines.

Skilled Labour Attributes and Construction Performance

The role of human capital in the construction industry is widely acknowledged. Literature on construction productivity underscores that labour skills, qualifications, and competencies are essential determinants of productivity and project success (Bahr & Laszig, 2021) . Studies in Africa and Asia have linked shortages of skilled labour with reduced construction performance, where training deficits and lack of technical expertise lead to slower task completion and quality issues (Baloyi & Bekker, 2011; Hwang et al., 2015; Karimi et al., 2017; summarized in a Malaysian journal article) .

Research focusing on labour performance in Nigeria found that low-skilled workers' performance—resulting from inadequate training and poor competencies—directly affects productivity and contributes to delays and inefficiency in project outcomes (Zannah et al., 2023) . Similarly, a study on labour attributes in unspecified project contexts identified that limited skill levels, poor commitment, and lack of motivation were major labour attributes leading to delays, often because such deficits cause errors, rework, and schedule disruptions (CUT Scholar labour study, 2025)

Skilled Labour in Pakistan's Construction Sector

Although international studies emphasize the importance of skilled labour in construction delivery, research within Pakistan is more limited and often focuses on general delay causes rather than dissecting labour attributes. Latif et al. (2023) included labour shortages among factors affecting project timelines but did not separately analyze skilled labour attributes in depth. Other work on construction delays in the Peshawar region reinforces

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labour issues as contributors to delays, alongside planning and material procurement challenges. Importantly, recent Pakistani investigations into delays after the COVID-19 pandemic pointed to workforce availability and limited labour resources as key delay contributors, hinting that labour quality and readiness are underlying systemic issues (Bhatti, Haider & Siddiqui, 2022)

2.3 Labour Attributes: Technical Skills and Experience

Technical competence refers to the ability of workers to perform construction tasks accurately and efficiently according to standards. Poor technical skills can lead to errors, defective work, and rework — all of which extend project durations. Several researchers emphasize that projects with highly skilled labour perform better and complete tasks faster than those with less trained workers (Jarkas & Bitar, 2012; Baloyi & Bekker, 2011 as cited in labour literature). Alaghbari and Sambasivan also indirectly suggest that factors such as supervision efficiency and contractor capability are linked to labour performance, since effective supervisors can enhance labour productivity by overseeing skilled tasks more efficiently (Rahman et al., 2020).

Communication and Work Ethics

Communication skills and work ethics are less tangible but equally important attributes. Poor communication among workers, supervisors, and managers can result in misunderstandings, delays in instructions, and reduced synchronization, which is recognized in broader delay literature as a cause of schedule overruns (Sambasivan & Soon, 2007). Although not always isolated as a separate factor, conflicts and miscommunication are frequently highlighted in delay research as contributors to inefficiency (Ain Shams Engineering review, 2023). Work ethic — including punctuality, commitment, and discipline — has been linked to performance outcomes. In some labour studies, lack of motivation, poor commitment, and low sense of project ownership were found to slow work progression and contribute to schedule delays (CUT Scholar labour study, 2025).

Training, Development and Labour Management

The literature makes strong recommendations for training and skill development to mitigate labour-related delays. Productivity development research stresses that investment in worker training and human capital development leads to higher productivity and improved project delivery (Bahr & Laszig, 2021). This argument is supported by Malaysian research suggesting that vocational and ongoing construction training helps alleviate labour shortages and raises skill levels, which in turn reduces execution delays (Rahim et al., 2025). In the Pakistani context, however, the absence of formal training pathways and reliance on informal skill acquisition creates disparities in competency levels, which practitioners identify as obstacles to timely completion of construction tasks.

While extensive studies on construction delays exist, a focused review on skilled labour attributes such as technical competence, communication skills, work ethics, adaptability, and safety awareness and how professional perceptions link these attributes to delays in Pakistan shows limited depth. Most existing research either treats labour as a component of broader delay factors or concentrates on general causes without dissecting specific attributes. This gap reinforces the need for the current study, which aims to isolate and analyze perceptions of skilled labour attributes and how these are perceived by construction practitioners to specifically influence project completion timelines

Methodology

This study adopted a quantitative research design to investigate the perceptions of construction professionals regarding the impact of skilled labour attributes on delays in construction projects in Pakistan. A quantitative approach was selected because it allows for systematic measurement of respondents' perceptions and statistical analysis of relationships between skilled labour attributes and project delays (Creswell, 2014). The design facilitates objective comparison and ranking of different labour attributes based on their perceived impact. The target population of the study consisted of contractors, consultants, site engineers, and project managers involved in building and infrastructure projects across major cities of Pakistan, including Lahore, Karachi, and Islamabad. These professionals were selected because they have direct interaction with skilled labour and can reliably assess the effect of labour attributes on project timelines. A purposive sampling technique was employed to ensure that

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only respondents with relevant experience and knowledge participated in the study. This non-probability method was appropriate because it focused on selecting individuals who are most capable of providing meaningful insights into the research topic. A total of 180 questionnaires were distributed among construction professionals. Out of these, 140 valid responses were received, resulting in a response rate of approximately 78%. This sample size was considered sufficient to perform descriptive statistical analysis and provide generalizable insights for the target population. The inclusion criteria were professionals with at least three years of experience in construction projects and directly involved in project execution or supervision. The exclusion criteria included junior staff, trainees, or administrative personnel who do not have regular interaction with skilled labour on site.

Data were collected using a structured questionnaire divided into two sections. The first section captured demographic information such as role, years of experience, and type of projects managed. The second section assessed perceptions of skilled labour attributes, including technical skills, work experience, communication skills, work ethics, teamwork, adaptability, and safety awareness, using a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The reliability of the questionnaire was tested using Cronbach's alpha, yielding a value of 0.87, indicating high internal consistency (Nunnally, 1978). Content validity was ensured through expert review by experienced construction professionals to confirm that the items adequately represented the research constructs. Ethical standards were maintained throughout the study. Participants were provided with information about the purpose of the research, assured of confidentiality, and informed that participation was voluntary. Written consent was obtained from all respondents, and data were used solely for research purposes.

Results & Discussion

The data collected from 140 respondents were analyzed to determine the perceptions of construction professionals regarding the impact of skilled labour attributes on construction project delays in Pakistan. The demographic analysis indicated that 65% of respondents had more than five years of experience in construction project management, while 25% had 3–5 years of experience, and the remaining 10% had less than three years. This distribution ensured that the opinions gathered were from professionals with sufficient exposure to project execution and labour management. The respondents included contractors (35%), site engineers (30%), project managers (20%), and consultants (15%), representing a diverse spectrum of stakeholders involved in construction projects. Reliability analysis of the questionnaire was conducted using Cronbach's alpha, resulting in a value of 0.87, which indicates high internal consistency and reliability of the instrument. This confirms that the items measuring skilled labour attributes and their perceived impact on delays were coherent and suitable for further statistical analysis (Nunnally, 1978).

The analysis focused on seven key skilled labour attributes: technical skills, work experience, communication skills, work ethics, teamwork, adaptability, and safety awareness. Respondents were asked to rate the influence of each attribute on project delays using a five-point Likert scale, where higher scores indicate a greater perceived impact. The mean scores were calculated to determine the relative importance of each attribute. Technical skills emerged as the most significant factor contributing to project delays, with a mean score of 4.62. Respondents emphasized that workers lacking adequate technical competence often perform tasks incorrectly, leading to errors, rework, and prolonged project timelines. Work experience was ranked second, with a mean score of 4.48, indicating that less experienced workers require additional supervision and take longer to complete tasks. Respondents highlighted that experienced workers are better equipped to handle complex situations, anticipate potential problems, and maintain smooth workflow on site.

Communication skills received a mean score of 4.30, reflecting its critical role in coordinating activities among workers, supervisors, and project managers. Ineffective communication was reported to cause misunderstandings, delays in instruction implementation, and inefficient task allocation. Work ethics, including punctuality, commitment, and discipline, were rated with a mean of 4.25. Poor work ethics were associated with absenteeism, low motivation, and reduced productivity, all of which contribute to schedule overruns. Teamwork and adaptability scored 4.10 and 4.05, respectively, highlighting the importance of collaboration and flexibility in

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managing complex construction activities. Respondents noted that projects involving multiple trades or rapidly changing site conditions require workers who can cooperate effectively and adapt to new tasks or methods. Failure in teamwork or adaptability can lead to coordination issues, idle time, and delays. Safety awareness was perceived as the least direct contributor to delays, with a mean score of 3.90; however, respondents acknowledged that insufficient safety practices can indirectly affect timelines through accidents, work stoppages, and rework.

A ranking analysis of the attributes confirmed the order of significance as follows: technical skills > work experience > communication skills > work ethics > teamwork > adaptability > safety awareness. This ranking indicates that while all attributes are important, technical skills and experience are perceived as the most critical determinants of project timeliness. Descriptive statistics also showed low standard deviations for technical skills and experience, suggesting a strong consensus among respondents regarding their impact on delays. The findings highlight that deficiencies in skilled labour attributes not only contribute to delays but also exacerbate other project challenges, such as cost overruns, quality issues, and conflicts among stakeholders. Projects with poorly skilled or untrained workers often require repeated inspections, corrections, and rework, which collectively extend project duration. Conversely, enhancing technical skills, providing structured training, and promoting effective communication and teamwork can significantly improve labour productivity and reduce project delays.

Overall, the analysis demonstrates a clear relationship between skilled labour attributes and construction delays in Pakistan. The study confirms that targeted interventions focusing on labour skill enhancement, experience development, communication improvement, and motivation can help mitigate delays. These findings provide practical insights for contractors, project managers, and policymakers to optimize workforce management and improve overall project performance.

Conclusion

The findings of this study indicate a strong relationship between skilled labour attributes and delays in construction projects in Pakistan. The analysis highlighted that technical skills and work experience are the most critical factors perceived by construction professionals to influence project timelines. This aligns with previous research, which emphasized that inadequately trained or inexperienced workers contribute significantly to errors, rework, and extended project duration (Jarkas & Bitar, 2012; Doloi et al., 2012). The respondents consistently rated communication skills, work ethics, teamwork, adaptability, and safety awareness as important, though secondary, contributors to delays. This confirms that project success in the construction industry is not solely dependent on technical competence but also on soft skills, collaboration, and safety practices. The study also revealed that poor communication between skilled labour and site management leads to misunderstandings, misallocation of resources, and inefficiencies in task execution. Similarly, weak work ethics, such as absenteeism and lack of commitment, exacerbate delays, supporting findings from Sambasivan and Soon (2007). Teamwork and adaptability were recognized as essential in handling the dynamic nature of construction sites, particularly when multiple trades and changing conditions are involved. Safety awareness, while having a slightly lower direct impact, indirectly affects project schedules through accidents, work stoppages, and rework (Tam, Zeng, & Deng, 2011). These results collectively highlight the multidimensional nature of skilled labour contributions to project performance.

From a practical perspective, the findings suggest that construction companies and policymakers need to prioritize structured training programs, effective supervision, and skill certification for labourers. Emphasis on both technical and soft skills can enhance productivity, reduce errors, and minimize delays. Introducing mentorship programs, continuous skill assessments, and incentives for performance can further improve workforce motivation and commitment. Moreover, fostering a safety-oriented culture on site ensures that potential accidents do not disrupt project progress, thereby maintaining continuity. The study contributes to the body of knowledge on construction management in Pakistan by systematically examining the perceptions of professionals regarding skilled labour attributes. It addresses a gap in previous research, which often focused on general delay factors such as financial issues or material shortages without isolating the role of labour characteristics (Latif, Saleem, &

Cheema, 2023; Riaz et al., 2020). By identifying the key labour attributes that influence delays, this research provides actionable insights for improving project performance and achieving timely completion.

In conclusion, skilled labour attributes play a decisive role in construction project delays. Technical competence and experience are the primary determinants, while communication skills, work ethics, teamwork, adaptability, and safety awareness act as supplementary but significant factors. Enhancing these attributes through training, supervision, and policy interventions can substantially mitigate delays, improve labour productivity, and optimize project outcomes. Construction stakeholders, including contractors, project managers, and policymakers, should incorporate these findings into workforce development strategies to ensure sustainable and efficient project execution in Pakistan.

References

Ahmed, I., Ali, A. N., & Nafees, A. A. (2018). *Occupational health and safety issues in the informal economic segment of Pakistan: A survey of construction sites. International Journal of Occupational Safety and Ergonomics*, *24*(2), 240–250.

Aibinu, A. A., & Jagboro, G. O. (2002). The effects of construction delays on project delivery in Nigerian construction industry. *International journal of project management*, *20*(8), 593-599.

Assaf, S. A., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *International journal of project management*, *24*(4), 349-357.

Doloi, H., Sawhney, A., Iyer, K. C., & Rentala, S. (2012). Analysing factors affecting delays in Indian construction projects. *International journal of project management*, *30*(4), 479-489.

Sarwar, Z., Lodhi, M. S., Khan, M. A., & Ali, S. T. (2021). Evaluating causes of delay in construction projects of Pakistan. *Civil and Environmental Research*.

Haseeb, M., Bibi, X. L. A., & Rabbani, W. (2011). Causes and effects of delays in large construction projects of Pakistan. *Arabian Journal of Business and Management Review (Kuwait Chapter)*, *1*(4), 18-42.

Jarkas, A. M., & Bitar, C. G. (2012). Factors affecting construction labor productivity in Kuwait. *Journal of construction engineering and management*, *138*(7), 811-820.

Latif, M., Saleem, M., & Cheema, S. M. (2023). Analyzing the key factors contributing to project delays in the construction industry: A comprehensive study. *Journal of Development and Social Sciences*, *4*(3), 936-944.

Musarat, M. A., Alaloul, W. S., & Liew, M. S. (2021). Impact of inflation rate on construction projects budget: A review. *Ain Shams Engineering Journal*, *12*(1), 407-414.

Memon, A. H., Memon, A. Q., Khahro, S. H., & Javed, Y. (2023). Investigation of project delays: Towards a sustainable construction industry. *Sustainability*, *15*(2), 1457.

Homthong, S., Moungnoi, W., & Charoenngam, C. (2024). Whole life critical factors influencing construction project performance for different objectives: Evidence from Thailand. *Buildings*, *14*(4), 999.

Hwang, B.-G., Zhao, X., & Gay, M. J. S. (2015). Public private partnership projects: An examination of project success factors. *International Journal of Project Management, 33*(5), 1335–1346.

Nunnally, J. C. (1978). Psychometric theory (2nd ed.). McGraw-Hill.

Riaz, A., Ahmed, K., & Javed, F. (2020). Causes of construction delays in Pakistan: Contractor's perspective. Journal of Construction Management, 22(1), 55–67. https://doi.org/10.1080/15623599.2020.1712145

Rashid, K., et al. (2020). Causes of construction delay in Pakistan: A review. *Mehran University Research Journal of Engineering and Technology, 39*(4), 817–829.

Sambasivan, M., & Soon, Y. W. (2007). Causes and effects of delays in Malaysian construction industry. International Journal of Project Management, 25(5), 517–526. https://doi.org/10.1016/j.ijproman.2006.11.007

Sohu, S., & Chandio, A. F. (2019). Identification of causes and minimization of delays in highway projects of Pakistan. *Mehran University Research Journal of Engineering & Technology*, *38*(1), 103-112.

Tam, C. M., Zeng, S. X., & Deng, Z. M. (2011). Identifying elements of poor workmanship in construction projects. *International Journal of Project Management, 29*(8), 1008–1019.