Silent Failures: Uncovering the Root Causes of Poor Communication in Malaysian Construction Projects

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Abstract: Communication-related issues significantly hinder project performance throughout the construction project lifecycle. This study aimed to identify the key causes of poor communication in construction projects to mitigate communication-related issues. A comprehensive literature review identified 20 potential causes and a questionnaire survey was conducted with 106 Malaysian construction stakeholders, including clients, consultants and developers. The data were analysed using descriptive and inferential statistics. The study found five primary causes of poor communication, namely: (1) lack of effective communication between parties, (2) poor planning and coordination, (3) inadequate communication skills, (4) unclear objectives and (5) improper communication channels. The study's exploratory factor analysis revealed four underlying factors contributing to poor communication: (1) ineffective communication and supportive tools, (2) noise in communication, (3) fragmentation and coordination problems and (4) improper planning and language disabilities. These findings provide valuable insights for construction practitioners, offering guidance on addressing communication issues before they negatively impact project performance. The study also informs researchers and practitioners on the critical causes of poor communication, facilitating the development of effective strategies to enhance communication effectiveness.

Keywords: Construction industry, Poor communication, Communication failure, Construction project delivery, Malaysian construction

INTRODUCTION

The complexity of construction projects that involve multiple stakeholders, such as architects, engineers, contractors and clients, necessitates a high level of coordination. Miscommunication or delays can result in significant project challenges, including costly errors, project delays and safety hazards. These issues can lead to slow progress, necessitate redesigns and exacerbate problems such as high accident rates, a demotivated workforce, poor teamwork and delayed responses to emergencies or disasters, further compounding the negative impacts on project outcomes (Suleiman, 2022; Abdallah, Shaawat and Almohassen, 2024). Specifically, they often contribute to cost overruns, disputes among stakeholders, poor work quality and even project failure (Yap et al., 2021; Suleiman et al., 2023; Abdallah, Shaawat and Almohassen, 2024;

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Yakubu, Ogunsanmi and Yakubu, 2019). Therefore, effective communication is the foundation of successful construction projects. Every phase, from the design phase to final handover, clear and timely information exchange is crucial at every stage (Senaratne and Ruwanpura, 2016).

The dynamic nature of construction, marked by design changes, unforeseen site conditions and varying regulatory requirements, further underscores the need for efficient communication. Timely and accurate communication ensures that such changes are quickly addressed, keeping the project on track (Pamidimukkala, Kermanshachi and Rad, 2023; Yap, Low and Wang, 2017). Establishing high-quality communication in construction projects is essential to ensuring effective collaboration and maintaining a shared understanding among stakeholders. Indeed, strong communication promotes teamwork, keeps all parties aligned with project goals and plays a vital role in achieving successful outcomes (Franz et al., 2016; Rahimian et al., 2022; Wu et al., 2017). However, communication challenges are prevalent in construction globally.

In Malaysia, miscommunications are particularly pronounced due to the widespread use of the traditional design-bid-build (DBB) procurement method (Shehu et al., 2015). This approach inherently fosters a high degree of fragmentation between contracting parties, restricting communication and reinforcing an adversarial "them-and-us" mentality (Yap, Chow and Shavarebi, 2019). Such fragmentation hinders collaboration and promotes a culture of blame, further complicating time and cost control in projects (Shehu et al., 2015). Given these challenges, communication problems are strongly linked to project delays (Yap et al., 2021; Khahro et al., 2023). A survey of 121 construction professionals in Klang Valley identified time overrun as the most dominant consequence of poor communication, followed by project failure, cost overrun and site accidents (Quan et al. 2022). The primary communication issues include inaccuracies, delays in information exchange and message distortion (Aziz, Rahim and Aziz, 2022a).

The persistent underperformance of Malaysia's construction sector is deeply rooted in ineffective communication. Recognising this, researchers globally have identified communication management as a key strategy to mitigate critical issues such as delays (Aziz, Rahim and Aziz, 2022a), cost overruns (Yap, Abdul-Rahman and Wang, 2018), disputes (Gamil and Rahman, 2023a), productivity inefficiencies (Al-aloosy, Mirvalad and Shabakhty, 2024) and rework (Yap, Abdul-Rahman and Chen, 2017). Taking cognisance of these communication barriers is essential for enhancing project outcomes and improving overall industry efficiency, enabling the formulation of targeted strategies for effective mitigation and long-term improvement.

Large-scale construction projects are inherently complex and uncertain, involving stakeholders with differing objectives, skills and values. This increases the probabilities of fragmentation, poor knowledge sharing and communication breakdowns, which are the key contributors to inefficiencies and cost overruns (Perera, Azadnia and Ghadimi, 2022; Yap, Chow and Shavarebi, 2019). Establishing high-quality communication is therefore critical to securing collaboration and ensuring shared understanding among stakeholders. Rahimian et al. (2022) surveyed 180 construction practitioners and identified leadership, listening, team building and clarifying expectations as crucial interpersonal skills for improving communication. These skills influence conflict resolution, team development and on-site productivity, highlighting the importance of interpersonal communication in achieving project success. In addition to interpersonal factors, technology plays a crucial role in communication efficiency. However, research by Den Otter and Emmitt (2007) suggests that construction teams often lack a structured framework for digital communication. Improper tool usage, inadequate training and weak management skills can undermine the benefits of digital solutions. More recently, Xie et al. (2023) identified five critical barriers to effective communication in projects facing time uncertainties, namely, (1) probability and statistical complexities, (2) availability of external data, (3) team member experience, (4) graphical presentation skills and (5) 4D simulation skills. Understanding these barriers is essential to improving communication and reducing project delays, confusion and rework costs.

Poor communication remains a critical issue, particularly in aligning project designs with client expectations and fostering mutual understanding among stakeholders (Tipili, Ojeba and Ilyasu, 2014). The complexity and diversity of stakeholders in construction projects make effective communication essential for project success. Despite extensive research on communication in construction, limited studies have explored Malaysia's unique industry dynamics, which are reflective of many developing countries. Consequently, the current research bridged that gap by identifying the underlying dimensions of communication breakdowns within Malaysia's fragmented, DBB, a driven construction industry, a crucial yet underexplored factor affecting project performance. By uncovering latent root causes that may not be immediately apparent, this study provides novel insights into Malaysia's construction communication challenges. These findings enable the development of context-specific strategies to enhance collaboration, reduce inefficiencies and improve overall industry performance. The study's contributions extend to incremental knowledge development and empirical validation in construction literature, particularly by advancing communication management theories within the highly fragmented procurement landscape of a developing country. Ultimately, this study has the potential to reshape industry communication practices, fostering a more cohesive, efficient and high-performing Malaysian construction industry.

LITERATURE REVIEW

Causes of Poor Communications

This study employed deductive content analysis of existing literature to establish a theoretical foundation and identify 20 predominant causes of poor communication.

Effective communication is critical in construction projects, as evidenced by various studies across different contexts (as shown in Table 1). Through a bibliometric analysis, communication was the most significant challenge faced by design teams, appearing in 78.7% of the reviewed articles (Galaz-delgado et al., 2021). It was closely linked to collaboration, coordination, information exchange and trust, underscoring its central role in project success. Aziz, Rahim and Aziz (2022b), in their review of 17 studies from 2016 to 2020, highlighted that communication challenges in the construction industry remain understudied in developing countries. While they identified 10 key communication issues and proposed solutions, they did not explore the root causes, which are critical for understanding the underlying triggers of these problems.

Table 1. Identification of causes from previous studies

Code	Causes of Poor Communications	Source
CF1	Inappropriate communication channel	Ejohwomu, Oshodi and Lam (2017); Hatem, Naji and Alkreem (2018); Ochieng and Price (2010); Olanrewaju et al. (2024); Suleiman et al. (2023); Tai, Wang and Anumba (2009)
CF2	Lack of mutual respect and trust among construction teams	Assaf, Hassanain and Mughal (2014); Latif and Williams (2017); Olanrewaju et al. (2024); Suleiman et al. (2023)
CF3	Lack of clear objectives	Ejohwomu, Oshodi and Lam (2017); English (2002); Olanrewaju et al. (2024); Taleb et al. (2017)
CF4	Language barrier	Emuze and James (2013); Loosemore and Lee (2002); Olanrewaju, Tan and Kwan. (2017); Olanrewaju et al. (2024); Trajkovski and Loosemore (2006)
CF5	Complexity of the construction industry	Hussain et al. (2018); Wood and Gidado (2008)

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Table 1 *Continued*

Code	Causes of Poor Communications	Source
CF6	Poor planning and coordination	Abdallah, Shaawat and Almohassen (2024); Alaloul, Liew and Zawawi (2016); Assaf, Hassanain and Mughal (2014); Assaf and Al-Hejji (2006); Hussain et al. (2018); Suleiman et al. (2023)
CF7	Noise interference at the construction site	Fernandez et al. (2009); Haslam et al. (2005); Olanrewaju, Tan and Kwan (2017)
CF8	Slow information flow between parties	Abdallah, Shaawat and Almohassen (2024); Enshassi, Al-Najjar and Kumaraswamy (2009); Tsai (2009); Xu and Luo (2014)
CF9	Lack of effective communication system and platform	Gamil and Rahman (2023a); Suleiman et al. (2023); Vasista and Abone (2018)
CF10	Poor communication skills	El-Razek, Bassioni and Mobarak (2008); Olanrewaju, Tan and Kwan (2017); Zulch (2016)
CF11	Differences in education levels among construction teams	Emuze and James (2013); Hussain et al. (2018); Suleiman et al. (2023)
CF12	Personal barrier	Abdallah, Shaawat and Almohassen (2024); Emuze and James (2013); Liu, Baldwin and Shen (2006)
CF13	Variations in skill levels among construction teams	Berenger and Justus (2016); Odusami (2002); Suleiman et al. (2023)
CF14	Lack of appropriate communication medium	Otter and Emmitt (2007); English (2002); Tai, Wang and Anumba (2009)
CF15	Poor communication management	Ejohwomu, Oshodi and Lam (2017); Hussain et al. (2018); Suleiman et al. (2023); Tipili, Ojeba and Ilyasu (2014)
CF16	Lack of effective communication between construction parties	Abdallah, Shaawat and Almohassen (2024); Dainty, Moore and Murray (2006); Emuze and James (2013)
CF17	Lack of support for advanced communication technologies	Daim et al. (2012); Hatem, Naji and Alkreem (2018); Suleiman et al. (2023)

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Table 1 *Continued*

Code	Causes of Poor Communications	Source
CF18	Diversity of culture and ethics among construction teams	Lim and Alum (1995); Loosemore and Lee (2002)
CF19	Lack of communication plan	Olanrewaju et al. (2024); Senaratne and Ruwanpura (2016); Suleiman et al. (2023); Taleb et al. (2017)
CF20	High power distance	Bröchner, Josephson and Kadefors (2002); Fong and Lung (2007)

More recently, Olanrewaju et al. (2024) examined 20 communication barriers in Nigeria. They categorised them into four groups: (1) management, (2) employee, (3) organisational and (4) work-related, while suggesting strategies such as diversity, clear goals, advanced tools, leadership, teamwork and work-life balance. However, their study overlooked the perspectives of client-side personnel, a key stakeholder group in construction communication. Kwofie, Aigbavboa and Matsane (2018) investigated communication breakdowns in South Africa and identified cognitive, behavioural and environmental factors as social barriers within the construction supply chain. However, their study primarily focused on social barriers, overlooking other critical dimensions of communication issues, such as technological, procedural and organisational factors, which also play a significant role in construction project communication failures.

In Malaysia, Gamil and Rahman (2023b) highlighted the lack of in-depth exploration into the causes and effects of poor communication in the construction industry. To address this, they applied structural equation modelling (SEM) to data from 262 construction professionals, categorising 30 causes of poor communication into organisational, informational, behavioural and technological aspects. They also identified 17 effects, linking poor communication to inefficiencies, project delays and reduced workforce productivity. While these studies provide valuable insights into communication challenges and their consequences, they fall short of uncovering the fundamental root causes that trigger poor communication. A deeper understanding of these underlying dimensions is essential for developing targeted strategies to mitigate communication breakdowns effectively.

The relationship between communication practices and project success has also been a focus of research. Wu et al. (2017) found that formal communication practices positively correlated with project success, while informal communication had a detrimental effect. This was further echoed

by Kwofie, Aigbavboa and Machethe (2019) in their study of non-traditional procurement systems in South Africa, where communication inaccuracies and procedural issues were frequent challenges. Emuze and James (2013) also pointed to cultural and language diversity as key factors leading to miscommunication, rework and productivity losses, stressing the importance of shared cultural understanding to improve communication on construction sites. Studies in Nigeria have further illuminated communication challenges within the construction sector. Ejohwomu, Oshodi and Lam (2017) identified unclear project objectives, ineffective reporting systems and poor leadership as major communication barriers, rooted in managerial, technical and credibility issues. They stressed the need for post-project reviews to enhance knowledge sharing and prevent recurring communication failures. Similarly, Ishaq, Omar and Mohammed (2018) reported that a lack of cooperation, self-interest and mistrust between clients and contractors severely undermined project success, revealing the deep-seated communication problems within the Nigerian construction industry.

In Jordan, Suleiman et al. (2023) identified communication gaps caused by differences in educational levels, lack of formal communication strategies and inadequate tools, pointing to a need for systemic improvements. Meanwhile, Gustavo and Nicholas (2011) found that strained relationships between main contractors and subcontractors in Australia, often resulting from payment disputes and delayed updates, disrupted project coordination. Safapour et al. (2019) added that poorly defined project scopes and objectives further compounded communication challenges, particularly in cross-border collaborations where language and cultural barriers add complexity. In addition, Pamidimukkala, Kermanshachi and Rad et al. (2023) underscored the multifaceted nature of communication challenges in construction projects. They revealed that workforce experience, cultural and language differences, environmental conditions and perceptions of managerial roles all influence communication effectiveness. These findings highlight the complexity of ensuring effective communication in multi-stakeholder environments and underscore the need for robust communication strategies to mitigate these challenges.

METHODOLOGY

This study adopted a post-positivist paradigm and employed a deductive approach to identify the causes of poor communication within the Malaysian construction industry. The variables under investigation were derived from prior construction management studies and empirically tested in this specific context. This paradigm ensured a rigorous yet flexible approach, allowing for empirical testing while acknowledging contextual influences on communication challenges in construction projects. The research instrument

employed was a questionnaire. It was chosen for its practicality and cost-effectiveness in gathering responses from a large sample of participants. The quantitative data collected were analysed using both descriptive and non-parametric inferential statistics in the SPSS, as the Shapiro-Wilk test confirmed that the data do not follow a normal distribution. Consequently, the Kruskal-Wallis (KW) test was employed to compare differences across groups, ensuring appropriate statistical analysis for non-parametric data. To further explore the underlying dimensions of the identified causes, exploratory factor analysis was conducted to reveal the latent constructs involved.

Questionnaire Design

The survey questionnaire was structured into two sections. Part A focused on collecting respondents' background information. Part B asked respondents to evaluate the significance of the causes listed in Table 1 in contributing to poor communication during construction project delivery. A five-point Likert scale was used, where 1 indicated "Not at All Significant" and 5 indicated "Extremely Significant". To ensure clarity and address any potential issues, the questionnaire was pretested with two academics and three industry experts. The pre-test phase helped identify problem areas and improve overall comprehensibility.

Data Collection

The respondents consisted of construction professionals representing the three key stakeholder groups, namely (1) clients, (2) contractors and (3) consultants. The selection was to ensure a well-distributed sample that provides a comprehensive perspective on communication challenges in the construction industry. A non-probability sampling approach was chosen for its practicality and ability to efficiently reach a broad yet targeted sample of construction professionals. Given the diverse and specialised nature of the industry, stratified sampling was employed to ensure adequate representation of each stakeholder group. However, due to challenges in obtaining a fully randomised sample, convenience and snowball sampling techniques were used. Convenience sampling facilitated efficient data collection by leveraging professional networks on LinkedIn, WhatsApp and Messenger, ensuring responses from individuals actively engaged in construction projects. Additionally, snowball sampling helped expand the reach by encouraging respondents to share the survey within their professional circles. A total of 200 e-survey forms were distributed through these platforms, maximising participation while maintaining relevance to the study's focus. A sample size of 200 is typically sufficient for detecting significant relationships in a diverse industry like construction and is commonly used in construction management research (Wang et al., 2023; Olanrewaju et al., 2024). Over five

weeks, 106 valid responses were received, achieving a response rate of 53.0%. The rate is considered sufficient for reliable statistical analysis (Fellows and Liu, 2015). Each stratified subgroup contained over 30 responses, in line with the Central Limit Theorem, ensuring the sample's suitability for meaningful statistical inference (Roscoe, 1975; Yap and Skitmore, 2018). Additionally, the sample size exceeding 100 is appropriate for factor analysis, adhering to the recommended 5:1 ratio (Wang et al., 2023).

RESULTS AND ANALYSIS

Background of Respondents

Table 2 summarises the respondents' profiles, including organisation type, gender, age, work experience, education level and organisation size.

Table 2. Respondents' profile

Profile	Description	Respondent Group			Total	
		Clients (*n* = 31)	Contractors (*n* = 37)	Consultants (*n* = 38)	Total (*N* = 106)	%
Years of working experience	Less than 5 years	10	25	23	58	54.7
	6 years to 10 years	8	9	9	26	24.5
	11 years to 15 years	2	2	4	8	7.5
	16 years to 20 years	3	1	0	4	3.8
	More than 20 years	8	0	2	10	9.4
Education level	High school	3	0	0	3	2.8
	Diploma	2	0	1	3	2.8
	Bachelor's degree	24	36	34	94	88.7
	Post-graduate	2	1	3	6	5.7
Size of organisation (number of employers)	1 to 50	5	6	29	40	37.7
	51 to 200	13	13	6	32	30.2
	More than 200	13	18	3	34	32.1

The respondents were slightly skewed towards males, with 31 (29.2%) clients, 37 (34.9%) contractors and 38 (35.8%) consultants. The majority were aged between 21 and 30 years and nearly half had more than five years of experience in the construction industry. Approximately 94% held a bachelor's degree or higher. The respondents were evenly distributed based on the size of their organisations.

Analysis and Ranking of Causes

The reliability of the data was confirmed with a Cronbach's alpha (α) of 0.931, surpassing the minimum threshold of 0.70 required to establish internal consistency (Hair et al., 2019). Table 3 presents the mean and standard deviation for the significance ratings of each cause, as well as the rankings across the three respondent groups: clients, contractors and consultants. Overall, the mean scores ranged from 3.21 to 4.37, indicating that all the causes had a mean score above 3.0, indicating their importance on the rating scale.

Based on Table 3, the lack of effective communication between construction parties emerged as the most critical cause contributing to poor communication in the construction industry. Clients ranked it first, while contractors and consultants placed it second. This aligned with the findings of Gamil and Rahman (2017), who identified ineffective communication between parties as the primary cause out of 33 causes in the construction sector. Effective communication, defined as the clear and efficient exchange of ideas, information and instructions across all phases of a project, is crucial in construction (Keyton, 2017). However, the quality of communication is frequently compromised by noise interference (Suleiman, 2022), especially in such a dynamic and complex industry. Noise factors, such as language barriers, attitudes, emotions and differing perceptions, can significantly hinder communication among construction parties (Gamil and Rahman, 2023a; Meng et al., 2021). Consequently, a lack of effective communication often leads to misunderstandings and confusion, resulting in errors, delays, poor decision-making, cost overruns and overall ineffective coordination (Suleiman et al., 2023).

Ranked second was poor planning and coordination. This finding was consistent with the studies of Hussain et al. (2018) and Abdul Rahman and Gamil (2019), which highlighted poor planning and coordination as major contributors to communication breakdowns in the industry. Poor planning and coordination, rooted in organisational inefficiencies, often create chaotic environments that obstruct effective communication (Hussain et al., 2018). In such settings, stakeholders may interpret information differently, leading to further communication challenges (Vo, Nguyen and Nguyen, 2020). Given the diversity of stakeholders in construction, each with distinct objectives, knowledge,

skills and cultural backgrounds, it is essential to maintain robust planning and coordination throughout the project. This highlights the importance of communication planning and coordination, as effective information exchange ensures that tasks are executed accurately, on time and through appropriate channels, with the chosen communication medium playing a critical role in how the audience interprets the message (Xie et al., 2023; Suleiman, 2022).

Poor communication skills ranked third overall based on Table 3. Similar to Gamil and Rahman (2017), the current study identified poor communication skills as a crucial cause affecting communication in construction projects. Communication skills are fundamental for facilitating effective exchanges among project stakeholders. When stakeholders lack these skills, miscommunication is more likely to occur. For instance, El-Razek et al. (2008) found that poor communication between designers and clients during the design phase resulted in communication failures. Additionally, soft skills training, especially in communication and psychology, should be prioritised to improve project managers' competence, as weak communication skills can disrupt team dynamics (Shakeri et al., 2020). Effective communication, essential for trust and collaboration, remains a major challenge in the construction industry, underscoring the need for stakeholders to enhance their communication abilities (Zuo et al., 2018; Olanrewaju et al., 2024).

Another key issue was the lack of clear objectives, ranked as the fourth most significant cause overall. Consultants and contractors ranked it third and fourth, respectively, which was understandable given their responsibility for executing tasks based on defined objectives. Without clear goals, team members are left uncertain about the project's true purpose (Hussain et al., 2018), leading to miscommunication not only between individuals but also across groups and organisations (Wu et al., 2017). A study in Nigeria also identified unclear objectives as a major contributor to poor communication in construction (Olanrewaju et al., 2024). Inappropriate communication channels were ranked fifth overall. This finding was consistent with previous research by Gamil and Rahman (2017) and Obonadhuze et al. (2018). It was widely acknowledged that improper channels of communication severely hinder effective communication in the construction industry (Olanrewaju et al., 2024; Suleiman, 2022). When the communication channels are inadequate, misunderstandings between the sender and receiver become more likely (Hussain et al., 2018), as improper channels can cause messages to be misinterpreted or lost entirely. Lastly, noise interruption at construction sites was ranked the least significant cause, with a mean score of 3.21. This result mirrors the findings of Rahman and Gamil (2018) and suggests that construction practitioners may still be unaware of how significantly noise affects communication on site. Fernandez et al. (2009) argued that noise is a key contributor to communication breakdowns. For example, excessive

background noise from construction machinery not only causes physical strain on workers, such as headaches and eyestrain, but also prevents them from receiving accurate instructions (Olanrewaju et al., 2017).

As shown in Table 3, significant differences were found in the perception of improper communication channels among the respondent groups. Developers ranked this factor second, while contractors and consultants placed it sixth and seventh, respectively. This suggests that only developers consider improper communication channels a critical barrier to effective communication. Developers often struggle to interpret messages correctly through inadequate channels, such as relying solely on computer-mediated communication (CMC) like e-mails, when face-to-face (FTF) interactions might be more appropriate. While FTF allows for immediate, clear responses, CMC can lead to misunderstandings, as developers may give inaccurate feedback to consultants or contractors when only virtual communication is used. Although e-mail may suffice in some cases, certain situations require direct interaction to ensure clear, real-time feedback. For example, applying psychology to project communications underscores the critical role of body language, verbal communication and active listening in fostering effective communication, particularly for project managers (Shakeri et al., 2020). Additionally, regular FTF meetings enhance clarity, information exchange, feedback and spontaneity by overcoming physical distance and encouraging more direct interaction (Ishaq et al., 2019).

Table 3. Ranking of causes

Code	Causes of Poor Communications	Clients (*n* = 31) (*N* = 31)			Contractors (*n* = 37) (*N* = 37)			Consultants (*n* = 38) (*N* = 38)			Overall (*N* = 106) (*N* = 106)			KW	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi-Square	*p*-value
CF16	Lack of effective communication between construction parties	4.55	0.675	1	4.16	0.834	2	4.42	0.793	2	4.37	0.785	1	4.914	0.086
CF6	Poor planning and coordination	4.16	0.860	7	4.22	1.031	1	4.42	0.683	1	4.27	0.868	2	1.424	0.491
CF10	Poor communication skills	4.48	0.926	3	4.11	0.966	3	4.26	1.032	5	4.27	0.981	3	4.806	0.090
CF3	Lack of clear objectives	4.13	0.763	8	4.08	0.894	4	4.32	0.702	3	4.18	0.790	4	1.406	0.495
CF1	Inappropriate communication channel	4.48	0.890	2	4.00	0.913	6	4.11	0.981	7	4.18	0.944	5	6.419	0.040*
CF8	Slow information flow between parties	4.00	1.033	12	4.03	1.142	5	4.32	0.962	4	4.12	1.048	6	2.351	0.309
CF9	Lack of effective communication system and platform	4.35	0.839	4	3.89	1.100	8	4.11	1.008	8	4.10	1.004	7	3.394	0.183
CF14	Lack of appropriate communication medium	4.29	0.783	5	3.86	1.004	9	4.03	0.915	12	4.05	0.919	8	3.491	0.175
CF2	Lack of mutual respect and trust among construction teams	3.94	0.772	13	3.78	1.031	11	4.21	0.935	6	3.98	0.936	9	4.680	0.096

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Table 3 *Continued*

Code	Causes of Poor Communications	Clients (*n* = 31) (*N* = 31)			Contractors (*n* = 37) (*N* = 37)			Consultants (*n* = 38) (*N* = 38)			Overall (*N* = 106) (*N* = 106)			KW	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi-Square	*p*-value
CF5	Complexity of the construction industry	4.03	0.983	11	3.76	0.983	13	4.08	0.818	9	3.95	0.930	10	2.388	0.303
CF13	Variations in skill levels among construction teamsteams	4.10	1.106	9	3.68	1.107	15	4.05	0.957	11	3.93	1.063	11	3.767	0.152
CF15	Poor communication management	3.71	0.783	15	3.95	0.848	7	4.05	0.769	10	3.92	0.806	12	3.935	0.140
CF11	Differences in education levels among construction teams	4.26	0.999	6	3.65	1.274	16	3.89	1.158	15	3.92	1.172	13	4.413	0.110
CF17	Lack of support for advanced communication technologies	4.03	0.706	10	3.70	1.077	14	3.89	0.924	14	3.87	0.927	14	1.549	0.461
CF19	Lack of communication plan	3.55	1.028	18	3.84	0.898	10	3.92	0.818	13	3.78	0.916	15	2.640	0.267
CF4	Language barrier	3.77	1.087	14	3.78	1.109	12	3.61	0.887	17	3.72	1.021	16	1.330	0.514
CF20	High power distance	3.71	0.902	16	3.46	1.120	18	3.66	0.938	16	3.60	0.992	17	0.920	0.631

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Table 3 *Continued*

Code	Causes of Poor Communications	Clients (*n* = 31) (*N* = 31)			Contractors (*n* = 37) (*N* = 37)			Consultants (*n* = 38) (*N* = 38)			Overall (*N* = 106) (*N* = 106)			KW	
		Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Chi-Square	*p*-value
CF18	Diversity of culture and ethics among construction teams	3.65	1.050	17	3.57	1.042	17	3.53	1.059	18	3.58	1.042	18	0.475	0.789
CF12	Personal barrier	3.10	1.076	20	3.35	0.949	19	3.37	1.076	19	3.28	1.031	19	1.148	0.563
CF7	Noise interference at the construction site	3.48	0.996	19	3.03	1.343	20	3.16	1.103	20	3.21	1.169	20	2.817	0.245

Note: *The mean difference is significant at the 0.05 level.

Exploratory Factor Analysis

Factor analysis (FA) is a statistical technique for identifying underlying structures by explaining the covariance among variables (Hair et al., 2019). It is particularly useful for data reduction, consolidating interrelated variables into meaningful factors that capture common dimensions (Yap et al., 2022). By enhancing data interpretability and minimising redundancy, FA helps uncover the latent dimensions of communication challenges in the Malaysian construction industry, providing a clearer understanding of key factors contributing to poor communication.

To ensure robust factor extraction, Varimax rotation was applied to maximise factor independence, and the Kaiser criterion (eigenvalue ≥ 1) was used to determine the number of factors to retain. Additionally, only items with a factor loading of at least 0.40 were considered, ensuring that retained variables had a strong association with their respective factors. The Kaiser-Meyer-Olkin (KMO) statistic for the 20 causes was 0.866, well above the minimum threshold of 0.50, indicating sampling adequacy (Hair et al., 2019). Bartlett's test of sphericity yielded a chi-square value of 1,288.72, which was significant at $p < 0.01$ with 190 degrees of freedom (as shown in Table 4). This confirms that the correlation matrix is not an identity matrix, validating the use of FA.

Table 4. KMO and Barlett's test

Parameter	Value
KMO measure of sampling adequacy	0.8660
Barlett's test of sphericity	
Approximate chi-square	1,288.7200
Degree of freedom	190.0000
Significance	–

Dimensions of Poor Communications in Construction

The principal component FA results, presented in Table 5, revealed a four-factor solution that accounted for approximately 66% of the cumulative variance, exceeding the 60% threshold for construct validity (Hair et al., 2019). All 20 causes exhibited factor loadings above 0.50, indicating the high reliability of each factor (Cronbach's $\alpha > 0.70$). The naming of each dimension was based on the interpretation of the variables with the highest cross-factor loadings, ensuring a meaningful representation of the underlying constructs.

Table 5. Factor profile

Dimensions of Poor Communications and Associated Causes	Factor Loading	Variance Explained	Cronbach's α (After FA)	Average Mean
Dimension 1: Ineffective Communication and Supportive Tools		19.78	0.886	4.09
Poor communication skills	0.766	–	–	–
Inappropriate communication channel	0.752	–	–	–
Lack of appropriate communication medium	0.730	–	–	–
Lack of effective communication system and platform	0.718	–	–	–
Lack of support for advanced communication technologies	0.519	–	–	–
Dimension 2: Noises in Communication		18.20	0.855	3.65
Differences in education levels among construction team members	0.804	–	–	–
Diversity of culture and ethics among construction teams	0.784	–	–	–
Variations in skill levels among construction teams	0.759	–	–	–
Noise interference at the construction site	0.631	–	–	–
Personal barrier	0.550	–	–	–
Complexity of the construction industry	0.512	–	–	–
Dimension 3: Fragmentation and Coordination Problems		16.66	0.820	4.13
Lack of clear objectives	0.774	–	–	–
Lack of mutual respect and trust among construction teams	0.681	–	–	–
Slow information flow between parties	0.656	–	–	–
Poor planning and coordination	0.649	–	–	–
Lack of effective communication between construction parties	0.583	–	–	–

(Continued to next page)

Table 3 *Continued*

Dimensions of Poor Communications and Associated Causes	Factor Loading	Variance Explained	Cronbach's α (After FA)	Average Mean
Dimension 4: Improper Planning and Language Disabilities		11.25	0.764	3.76
Poor communication management	0.707	–	–	–
Lack of communication plan	0.684	–	–	–
Language barrier	0.539	–	–	–
High power distance	0.505	–	–	–
Cumulative variance explained		65.89		

Note: Extraction method = Principal component analysis; Rotation method: Varimax with Kaiser normalisation. Rotation converged in seven iterations.

Discussion of the underlying dimensions uncovered

Dimension 1: Ineffective communication and supportive tools

This factor explained the largest variance of 19.78%, encompassing poor communication skills, inappropriate communication channels, inadequate communication media, ineffective systems and insufficient technological support. This underscored the profound impact of these elements on communication problems in construction. Effective communication skills, such as writing, presenting and questioning, are fundamental to project success (Heldman, 2018). Furthermore, successful project management depends on the ability to understand stakeholders' behaviours, emotions and the various factors that influence interpersonal interactions (Shakeri et al., 2020). When team members lack these skills, miscommunication becomes prevalent, leading to critical issues at subsequent stages (Zulch, 2016; Yakubu, Ogunsanmi and Yakubu, 2019). For instance, if team members cannot clearly convey or interpret messages, misunderstandings proliferate, severely affecting project outcomes. According to Yakubu, Ogunsanmi and Yakubu (2019), misunderstandings in communication can be reduced by addressing attitudinal barriers, improving workers' health and communication skills and using both e-mail and FTF methods to resolve issues promptly.

The choice between FTF and CMC was crucial. While FTF interactions allow for immediate and clear feedback, CMC, like e-mails, can be inadequate for tasks requiring instant responses (Ishaq et al., 2019). Studies confirm that improper communication channels hinder effective interactions (Safapour et al., 2019; Yap, Chow and Shavarebi, 2019). Additionally, the lack of a suitable

communication medium can create confusion, as there is no one-size-fits-all solution for communication throughout a project's lifecycle. For instance, ineffective communication often arises when the medium is not aligned with stakeholders' preferences, making it crucial to select the appropriate method for clear and impactful exchanges (Suleiman et al., 2023). Although advanced technologies offer significant advantages, their high costs and implementation challenges limit widespread adoption (Yap, Chow and Shavarebi, 2019; Obonadhuze et al., 2018). However, when effectively integrated, these technologies can greatly enhance and sustain information dissemination.

Dimension 2: Noises in communication

Accounting for 18.20% of the variance, this factor highlighted discrepancies in education levels, cultural diversity and skill variations among construction team members. These inconsistencies were major barriers to effective communication. Diverse education levels could lead to communication gaps between different project tiers, such as management and labour (Suleiman et al., 2023). Cultural differences complicate communication by affecting message encoding and decoding but fostering interpersonal sensitivity through cultural awareness training and self-management can help bridge these gaps (Rehan, Thorpe and Heravi, 2024). Similarly, varying skill levels among team members can cause divergent interpretations of project details, such as technical drawings, exacerbating communication issues (Yap, Leong and Skitmore, 2020). Noise and personal barriers, such as stereotyping, further disrupt effective communication, making it challenging for team members to convey and understand messages accurately (Emuze and James, 2013).

Dimension 3: Fragmentation and coordination problems

This factor explained 16.66% of the variance and included unclear project objectives, lack of mutual respect and trust, slow information flow and inadequate planning. Fragmentation in the construction industry fostered adversarial relationships, creating a divisive "us versus them" mentality that undermines collaboration and leads to poor communication (Yap, Chow and Shavarebi, 2019). These issues are critical in determining project success. Clear objectives are essential for guiding team efforts. Without them, team members may struggle with the project's goals, leading to confusion and ineffective communication (Olanrewaju et al., 2024). Effective project management practices, such as clear objective setting and strategic planning, are crucial for preventing communication breakdowns (Alaloul, Liew and Zawawi, 2016). A positive correlation exists between clarity of scope and objectives and the quality of communication (Rahimian et al., 2022), further enhanced by exemplary leadership behaviours, including strong communication and listening skills, which foster collaboration with project

teams and stakeholders to achieve project objectives (Rehan, Thorpe and Heravi, 2024). Creating an environment where team members feel safe and encouraged to communicate openly requires fostering a culture of trust, mutual respect and open-mindedness (Rehan, Thorpe and Heravi, 2024). Trust is particularly vital for effective communication, as its absence can lead to withheld critical information, hindering the exchange of ideas and mutual understanding (Gamil and Rahman, 2023b). Furthermore, slow data flow and reliance on paper-based documentation delay communication and increase miscommunication (Xu and Luo, 2014).

Dimension 4: Improper planning and language disabilities

This factor, accounting for 11.25% of the variance, included poor communication management, absence of a communication plan, language barriers and high-power distance. These issues were pivotal in hindering effective communication. Inadequate communication management can severely impact project execution, leading to misunderstandings, delays, rework, cost overruns and safety violations on site (Abdallah, Shaawat and Almohassen, 2024). The lack of a formal communication plan can exacerbate these issues by failing to specify information flow, responsibility and communication methods (Taleb et al., 2017). Language barriers further complicated communication, especially in a diverse workforce, leading to frequent misinterpretations (Olanrewaju et al., 2017; Emuze and James, 2013). For instance, the Malaysian construction industry faces significant challenges stemming from its multicultural society, which includes diverse local ethnic groups and a foreign workforce from countries such as Bangladesh, Indonesia, Pakistan and Myanmar (Gamil and Rahman, 2023b). High power distance also creates barriers, as lower-level staff may fear voicing concerns or suggestions, resulting in limited communication and missed opportunities for improvement (Olanrewaju et al., 2017).

CONCLUSION

The construction industry is a cornerstone of national economies, including Malaysia and is characterised by its vast, dynamic and fragmented nature. Unlike other sectors, it demands substantial capital investment and the collaboration of multidisciplinary teams from various organisations to achieve project goals. Effective communication is paramount in this complex environment, yet it remains a persistent challenge that must be addressed to ensure project success. This study identified 20 critical causes of poor communication within the construction sector, with the most significant being: (1) inadequate communication between construction parties, (2) insufficient planning and coordination, (3) subpar communication skills, (4) unclear project objectives and (5) ineffective communication channels. The KW test further highlighted that only the issue of improper communication channels exhibited

statistically significant differences in perception among client, contractor and consultant groups. These findings underscore developers' greater struggle with virtual communication, emphasising the need to balance virtual and FTF interactions, where body language, verbal communication and active listening play a critical role in fostering effective communication and enabling prompt feedback. The study also revealed four underlying factors contributing to communication challenges: (1) ineffective communication and supportive tools, (2) noise in communication, (3) fragmentation and coordination problems and (4) improper planning and language disabilities. Addressing these factors is crucial for enhancing communication and achieving successful project outcomes in the construction industry.

Implications

This study provides critical insights into the pervasive issue of poor communication in the construction industry by identifying the underlying dimensions that contribute to communication breakdowns and their adverse effects on project outcomes. By uncovering latent root causes, it addresses existing research gaps and advances context-specific communication management strategies tailored to the complexities of a developing country's fragmented, DBB-driven industry. Beyond its empirical contributions, this study strengthens theoretical foundations in project communication management by extending existing models to enhance communication effectiveness within construction projects. The findings offer practical implications for industry stakeholders, equipping them with data-driven insights to enhance collaboration, mitigate inefficiencies and improve overall project performance. By shedding light on the fundamental factors driving poor communication, this study also raises awareness among construction practitioners, many of whom recognise communication challenges but may not fully grasp their severity or specific impacts. The insights gained pave the way for targeted mitigation strategies, serving not only to improve collaboration but also as a benchmark for assessing communication performance across the industry. Ultimately, this study contributes to fostering a more cohesive, efficient and high-performing construction environment.

Limitations and Future Research

This study's limitations primarily stem from its exclusive focus on communication challenges in construction projects, potentially overlooking other critical factors such as financial management, technical issues or external economic conditions that also contribute to project success. Future research could develop an integrated framework to assess the relative influence of these factors on project outcomes. Additionally, the reliance on a single data collection method, a field survey, may have introduced

self-reporting biases and restricted the study's ability to capture the full depth and complexity of respondents' experiences. Employing qualitative approaches, such as in-depth interviews, in future studies could provide richer contextual insights. Finally, the study's geographical focus on Malaysia may limit the generalisability of the findings to other regions with different cultural, economic and regulatory environments. Comparative studies across diverse regions in Asia to enhance the understanding of how communication challenges vary across contexts.

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