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The Role of Supervising Consultants in Enhancing Communication Effectiveness in Construction Projects: Evidence from Aceh Province, Indonesia

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Abstract: Construction projects involve complex, multi-stakeholder interactions in which ineffective communication often leads to delays, cost overruns, and reduced project quality, particularly in developing regions such as Aceh, Indonesia. This study examines the role of supervising consultants in enhancing communication effectiveness by identifying key determinants that influence communication outcomes in construction projects. A quantitative research design was employed using a structured questionnaire distributed to 33 Small (K) and Medium (M) grade construction supervision consultancy firms. Data were analyzed using descriptive statistics, Pearson's correlation, and multiple linear regression. The results indicate that all examined factors are perceived as highly important, with supervising consultant competence ranked highest. However, regression analysis reveals that only communication management has a statistically significant positive effect on communication effectiveness ($\beta = 0.465$, $p < 0.05$). Correlation analysis further shows that communication management, communication methods, and information flow are significantly associated with communication effectiveness, while consultant competence, supervision effectiveness, and project coordination are not statistically significant. These findings demonstrate that managerial and relational factors, including teamwork, openness, and shared understanding, are more influential than technical or structural factors. The study concludes that communication effectiveness in construction projects is primarily driven by how communication processes are managed rather than by individual competence or coordination alone. Strengthening communication management practices is therefore essential to improve coordination, minimize misunderstandings, and enhance project performance.

Keywords: Communication effectiveness; Construction projects; Communication management; Supervising consultants; Project coordination.



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1. Introduction

Construction projects play a critical role in infrastructure development and socio-economic growth, particularly in developing regions such as Aceh, Indonesia. Due to the complex and multi-stakeholder nature of construction activities, effective communication among project participants, including project owners, contractors, and supervising consultants, is essential for successful project delivery. Previous studies consistently highlight that communication is a fundamental mechanism for coordinating activities, aligning stakeholder expectations, and ensuring that project objectives are achieved (Construction Project Management). Ineffective communication, however, remains a persistent issue globally and is often associated with delays, cost overruns, and reduced project quality (Olanrewaju et al., 2017; Quan et al., 2022; Suleiman, 2022). In Indonesia, the Ministry of Public Works and Housing (2023) reports that approximately 35% of construction projects experience obstacles due to miscommunication, indicating the urgency of addressing communication challenges. This issue is particularly critical in Aceh, where rapid infrastructure development increases the need for efficient coordination among stakeholders.

In this context, supervising consultants play a pivotal role as intermediaries, facilitating communication between project owners and contractors. Their responsibilities extend beyond technical supervision to include ensuring that information is accurately conveyed, interpreted, and implemented. However, empirical evidence suggests that communication between supervising consultants and contractors is often ineffective, particularly in conveying technical changes and project updates (Fateh et al., 2023). This aligns with findings from Ishaq et al. (2018, 2019), which indicate that lack of cooperation, conflicting interests, and weak trust among stakeholders significantly contribute to communication breakdown in construction projects. Similarly, Arof (2020) and Akunyumu et al. (2019) highlight that poor coordination, ineffective meetings, and a lack of feedback further exacerbate communication challenges at the project level. Communication effectiveness is widely recognized as a critical determinant of project success. It encompasses message clarity, appropriate communication channels, timeliness, and stakeholders' ability to interpret and act on information (Aziz et al., 2022; Yap et al., 2026). Studies have shown that poor communication can significantly reduce project success rates, while effective communication enhances coordination, minimizes misunderstandings, and improves overall project performance (Setiawan et al., 2021; Alrasheed et al., 2026). Moreover, communication failures have been linked to severe consequences, including time overruns, cost escalation, safety risks, and even project failure (Quan et al., 2022; Suleiman et al., 2023).

To address these challenges, integrated communication management has been identified as a key factor in improving project outcomes. Mavuso and Agumba (2016) emphasize that communication effectiveness depends on multiple interrelated factors, including communication competence, planning, teamwork, and organizational structure. Similarly, Zulch (2016) highlights the importance of communication skills, leadership, and decision-making in enhancing communication practices. Empirical studies further demonstrate that structured communication planning and management significantly improve project performance by enhancing coordination and information flow among stakeholders (Setiawan et al., 2021; Alrasheed et al., 2026). In addition, Yap and Yu (2025) propose strategic approaches, such as trust-building and appropriate communication channels, to bridge communication gaps, while Ismail et al. (2024) emphasize practical initiatives such as timely feedback, cooperation, and structured communication processes.

Despite these advancements, communication problems remain prevalent in construction projects, particularly in housing development, which involves multiple stakeholders and require strict adherence to safety, quality, and sustainability standards. Ineffective communication in housing projects can lead to execution errors, delays, and compromised construction quality (Suleiman, 2022; Yap & Oo, 2025). Common issues include lack of coordination, delayed information flow, and misunderstandings in technical communication among project participants (Yap et al., 2026; Arof, 2020). Furthermore, factors such as cultural differences, varying skill levels, and inadequate communication procedures continue to hinder effective communication in construction projects (Suleiman et al., 2023).

Although prior studies have extensively examined the causes, effects, and strategies of communication in construction, most focus on general stakeholder interactions or on specific perspectives, such as contractors or project managers. Limited attention has been given to the role of supervising consultants as key intermediaries responsible for coordinating and managing communication processes across project stakeholders. Given their strategic position, supervising consultants are expected to play a crucial role in mitigating communication barriers, facilitating information exchange, and enhancing overall communication effectiveness. Therefore, this study aims to analyze the role of supervising consultants in influencing communication effectiveness in construction projects in Aceh, Indonesia, by examining key factors including consultant competence, communication methods, communication management, supervision effectiveness, information flow, and project coordination. Furthermore, this study seeks to identify the most significant

determinants of communication effectiveness and to explain the discrepancies between perceived importance and actual statistical influence of these factors.

2. Literature Review

2.1 Communication in Construction Project Management

Communication is widely recognized as a fundamental element of construction project management, particularly given the involvement of multiple stakeholders with diverse objectives, expertise, and responsibilities. Effective communication facilitates coordination, supports decision-making, and ensures alignment among project participants. According to Zulch (2016), communication competencies, such as decision-making, problem-solving, and conflict management, are essential for achieving project objectives. Similarly, Mavuso and Agumba (2016) emphasize that multiple interrelated factors, including communication planning, organizational structure, teamwork, and stakeholder alignment influence communication effectiveness. However, while these studies provide a strong conceptual foundation, they are largely theoretical and focus on general communication competencies rather than their practical implementation in complex project environments. In practice, communication is often influenced by contextual factors such as project complexity, stakeholder diversity, and organizational culture, which may limit the applicability of generic communication models. This suggests the need for empirical investigation into how communication processes are operationalized within specific project roles and contexts.

2.2 Causes and Barriers of Ineffective Communication

A substantial body of literature has examined the causes and barriers of ineffective communication in construction projects. Studies consistently identify both technical and human-related factors as key contributors to communication breakdown. For instance, Fateh et al. (2023) highlight personal attitudes and communication management as major determinants of communication failure between consultants and contractors. Similarly, Ishaq et al. (2018; 2019) emphasize that lack of cooperation, selfish interests, and weak trust among stakeholders significantly hinder effective communication. Other studies extend this discussion by identifying structural and organizational barriers. Suleiman (2022) and Suleiman et al. (2023) point out that lack of communication procedures, inadequate training, and poor information flow are critical causes of communication inefficiencies. Likewise, Yap et al. (2026) identify ineffective communication techniques, a lack of trust, and slow information flow as key barriers, and categorize them into broader dimensions such as organizational, technological, and cultural factors.

At the operational level, communication problems are further exacerbated by misinterpretation of instructions, a lack of shared language, and poor communication skills among workers (Olanrewaju et al., 2017). Additionally, Akunyumu et al. (2019) and Arof (2020) highlight that delays in information delivery, lack of feedback, and ineffective team meetings contribute significantly to communication breakdown. While these studies provide comprehensive insights into the causes of communication problems, they predominantly adopt a diagnostic approach, focusing on identifying barriers rather than on how to manage them effectively. Moreover, many studies emphasize individual or organizational factors without adequately considering the role of key actors who coordinate communication processes.

2.3 Effects of Poor Communication on Project Performance

The consequences of ineffective communication in construction projects are well documented in the literature. Poor communication has been linked to project delays, cost overruns, reduced quality, and safety risks. Quan et al. (2022) identify time overruns as the most significant effect of poor communication, followed by cost escalation and project failure. Similarly, Alrasheed et al. (2026) and Suleiman (2022) highlight that communication breakdown leads to strained stakeholder relationships, misinterpretation of information, and conflicts among project participants. These findings are consistent with broader project management research, which suggests that ineffective communication can significantly reduce project success rates, while effective communication enhances project performance and stakeholder satisfaction (Setiawan et al., 2021). Furthermore, communication failures may have long-term implications, including reputational damage and reduced organizational performance. Despite strong evidence of the negative impacts of poor communication, existing studies tend to focus on outcomes rather than the mechanisms by which communication effectiveness can be improved. This limits the ability to develop actionable strategies for enhancing communication in construction projects.

2.4 Strategies for Improving Communication Effectiveness

To address communication challenges, several studies have proposed strategies and models to improve communication effectiveness. Yap and Yu (2025) introduce the Contractor Communication

Enhancement Model (CCEM), which emphasizes trust-building, appropriate communication channels, and stakeholder alignment. Similarly, Ismail et al. (2024) propose practical initiatives such as promoting cooperation, ensuring timely feedback, and maintaining structured communication processes. Communication planning has also been identified as a critical factor in improving project performance. Setiawan et al. (2021) demonstrate that effective communication planning significantly enhances coordination and information flow, leading to improved project outcomes. Likewise, Alrasheed et al. (2026) emphasize the importance of formal communication plans and organizational support in mitigating communication challenges.

While these studies offer valuable insights, they often focus on general strategies without examining how these strategies are implemented in practice. There is limited discussion on the role of specific project actors in executing and sustaining these communication strategies. This highlights a gap between theoretical recommendations and practical implementation. The reviewed literature demonstrates that communication in construction projects is a multidimensional issue influenced by technical, organizational, and human factors. Previous studies have made significant contributions by identifying communication competencies (Zulch, 2016), management factors (Mavuso & Agumba, 2016), causes and barriers (Fateh et al., 2023; Yap et al., 2026; Suleiman et al., 2023), and consequences (Quan et al., 2022; Alrasheed et al., 2026). In addition, various strategies and models have been proposed to improve communication effectiveness (Yap & Yu, 2025; Ismail et al., 2024; Setiawan et al., 2021).

However, a critical limitation of existing studies is that they largely focus on identifying problems, factors, and strategies without adequately examining the role of key actors responsible for managing communication processes. In particular, the role of supervising consultants who act as intermediaries between project owners and contractors remains underexplored. Given their responsibilities in coordinating stakeholders, ensuring information accuracy, and facilitating decision-making, supervising consultants are likely to play a crucial role in enhancing communication effectiveness. Furthermore, most existing studies are conducted in different geographical contexts, such as Malaysia, Nigeria, Kuwait, and the MENA region, which may limit their applicability to the Aceh context. The unique socio-cultural and institutional characteristics of construction projects in Aceh necessitate context-specific investigation. Therefore, this study seeks to analyze the role of supervising consultants in facilitating effective communication in construction projects, with a specific focus on Aceh, Indonesia. By addressing these gaps, the study contributes to both theoretical development and practical improvement of communication management in construction projects.

2.5. Research Framework and Hypotheses Development

This study develops a conceptual framework to examine the relationship between supervising consultant roles and communication effectiveness in construction projects.

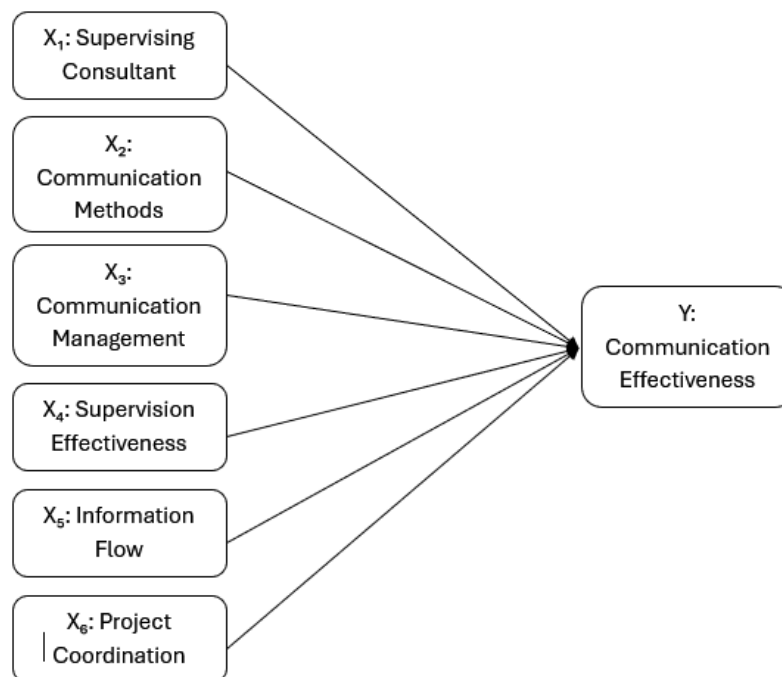


Figure 1. Research Framework

The framework is grounded in communication management theory and project management principles, which emphasize that effective communication is influenced by both technical and relational factors. The independent variables include supervising consultant competence (X_1), communication methods (X_2), communication management (X_3), supervision effectiveness (X_4), information flow (X_5), and project coordination (X_6). These variables are hypothesized to influence the dependent variable, communication effectiveness (Y). Among these factors, communication management is expected to play a central role, as it represents the process through which information is structured, shared, and interpreted among project stakeholders. The framework assumes that while technical and structural factors provide necessary conditions, communication effectiveness is primarily driven by how communication processes are managed. Based on the literature and conceptual arguments, the following hypotheses are proposed:

- H1: Supervising consultant competence (X_1) has a positive effect on communication effectiveness.
- H2: Communication methods (X_2) have a positive effect on communication effectiveness.
- H3: Communication management (X_3) has a positive and significant effect on communication effectiveness.
- H4: Supervision effectiveness (X_4) has a positive effect on communication effectiveness.
- H5: Information flow (X_5) has a positive effect on communication effectiveness.
- H6: Project coordination (X_6) has a positive effect on communication effectiveness.

3. Materials and Methods

3.1 Study Area

This study was conducted in Aceh Province, located at the northern tip of Sumatra Island. Administratively, Aceh is bordered by the Malacca Strait to the north and east, North Sumatra Province to the south, and the Indian Ocean to the west. The research focused on three main regions: Aceh Besar Regency, Banda Aceh, and Sabang. These locations were selected due to the presence of active construction supervision consultants, accessibility for data collection, and their representation of diverse construction project environments. Selecting multiple locations enables a more comprehensive understanding of communication practices and the role of supervising consultants across different project contexts in Aceh. These regions host a variety of ongoing construction projects and are considered strategic areas for examining communication dynamics in construction supervision.

3.2 Research Design

This study adopts a quantitative research approach using a survey method. The quantitative design is appropriate for measuring respondents' perceptions and analyzing relationships among variables using statistical techniques. Data were collected using structured questionnaires with a Likert scale, enabling qualitative perceptions to be quantified for statistical analysis.

3.3 Population and Sample

The population of this study consists of Small (K) and Medium (M) grade construction supervision consultancy firms that have handled projects under the Aceh Public Works and Spatial Planning Department (PUPR) within the last five years. A total of 33 consultancy firms were identified. Given the relatively small population size, this study employs a non-probability sampling technique, specifically purposive sampling, based on predetermined criteria relevant to the research objectives. Furthermore, a saturated sampling (census) approach was used, meaning that all 33 firms were included as the sample. This approach ensures comprehensive coverage and enhances the reliability of the findings.

3.4. Data Collection Procedure

Data were collected by distributing structured questionnaires to respondents from the selected consultancy firms. The questionnaire items were designed based on relevant literature on construction communication and supervision roles, ensuring content validity and alignment with research objectives. Respondents were asked to rate each statement using a Likert scale, as seen in Table 1.

Table 1. Research Variables and Indicators

Variable(s)	Code	Indicators
Supervising Consultant Competence	1.1	Mastery of contract documents
	1.2	Existing condition survey
	1.3	Payment certification
	1.4	Contractor performance evaluation

Communication Methods	2.1	Personal communication
	2.2	Two-way communication
	2.3	Use of communication media
	2.4	Use of communication modes
Communication Management	3.1	Teamwork
	3.2	Project understanding
	3.3	Communication openness
Supervision Effectiveness	4.1	Field presence
	4.2	Technical experience and capability
	4.3	Work methods
Information Flow	5.1	Inter-departmental information
	5.2	Project design change information
	5.3	Project reporting information
	5.4	Information clarity
Project Coordination	6.1	Coordination with contractors
	6.2	Coordination with internal parties
	6.3	Coordination with external parties
Communication Effectiveness	1.1	Use of facilities and technology
	1.2	Information delivery
	1.3	Communication skills
	1.4	Coordination relationships

3.5. Data Processing and Analysis

All collected data were processed using IBM SPSS Statistics. The data analysis procedure was carried out through several systematic stages to ensure the accuracy and reliability of the results.

3.5.1 Validity Test

Validity testing was conducted to evaluate whether the research instrument accurately measures the intended constructs. In this study, two types of validity tests were applied. First, item validity was assessed by correlating each item score with the total item score. Second, factor validity was examined by correlating each factor's scores with the overall factor score. An instrument is considered valid when it accurately represents the variables being measured, thereby ensuring that the collected data reflect the actual conditions of the study (Sugiyono, 2023).

3.5.2 Reliability Test

Reliability testing was conducted to evaluate the consistency of the measurement instrument. This study uses Cronbach's Alpha to assess internal consistency. An instrument is considered reliable if the Cronbach's Alpha value is ≥ 0.60 . Reliability levels are categorized as seen in Table 2 below:

Table 2. Summary of Alpha Coefficient Interval and Reliability Level

Interval(s)	Reliability Level(s)
0.00 – 0.20	Very Unreliable
0.21 – 0.40	Unreliable
0.41 – 0.60	Fairly Reliable
0.61 – 0.80	Reliable
0.81 – 1.00	Very Reliable

3.6. Data Analysis

After confirming that the data met the validity and reliability requirements, further statistical analyses were conducted to derive meaningful insights. Descriptive analysis was first employed to summarize and present the characteristics of respondents and the distribution of research variables. Subsequently, bivariate correlation was used to examine the strength and direction of relationships between the independent variables and the dependent variable. Finally, a multiple linear regression analysis was

performed to evaluate the influence of the independent variables (X_1-X_6) on the dependent variable (Y) and to identify the most significant factors affecting communication effectiveness in construction projects.

4. Results

4.1. Demography Profile of Respondents

The demographic characteristics of the respondents involved in this study. A total of 33 respondents participated, all of whom represent construction supervision consultancy firms in Aceh. The demographic profile provides important context for interpreting the findings, particularly in understanding respondents' experiences, qualifications, and organizational backgrounds.

Table 3. Result of the Demography Profile of Respondents

Characteristics	Categories	Frequency	Percentage
Gender	Male	33	100
	Female	0	0.0
Age	25–34 years	1	3.1
	35–44 years	13	39.3
	45–54 years	18	54.5
	> 54 years	1	3.1
	Diploma (D-III)	0	0.0
Education Level	Bachelor's Degree (S1)	31	93.9
	Master's Degree (S2)	2	6.1
	Doctoral Degree (S3)	0	0.0
Company Qualification	Small (K)	27	81.8
	Medium (M)	6	18.2
Experience in the Construction Field	3–5 years	4	12.1
	6–8 years	17	51.5
	> 8 years	12	36.4

Table 3 shows that all respondents are male (100%), with no females recorded. This indicates a strong gender imbalance within the construction supervision sector in the study area, reflecting the traditionally male-dominated nature of the construction industry. This composition may influence perspectives on communication practices, as prior studies suggest that demographic factors can shape workplace communication styles. Regarding age distribution, the majority of respondents fall into the 45–54-year age group (54.5%), followed by those aged 35–44 (39.3%). Only a small proportion of respondents are in the 25–34 years (3.1%) and above 54 years (3.1%) categories. This suggests that most respondents are in the mid- to late-career stages, indicating a high level of professional maturity and accumulated experience. Such a profile is advantageous for this study, as it ensures that responses are grounded in substantial practical experience in construction project environments.

In terms of educational background, the majority of respondents hold a Bachelor's degree (S1) (93.9%), while a smaller proportion possess a Master's degree (S2) (6.1%). No respondents reported holding Diploma (D-III) or Doctoral (S3) qualifications. This indicates that the respondents generally have a solid academic foundation in construction and engineering, which supports their ability to understand and evaluate communication processes within projects. Regarding company qualification, most respondents are affiliated with Small (K) category firms (81.8%), while the remaining 18.2% are affiliated with Medium (M) category firms. This distribution reflects the dominance of small-scale consultancy firms in the study area. It also suggests that the findings of this study are particularly relevant to small and medium enterprises (SMEs) in the construction supervision sector, which often face unique challenges in communication and resource management.

Finally, regarding work experience, more than half of the respondents (51.5%) have 6–8 years of experience in the construction field, followed by 36.4% with more than 8 years and 12.1% with 3–5 years. This indicates that the majority of respondents possess moderate to extensive experience in construction projects. The relatively high level of experience enhances data reliability, as respondents are likely to have encountered various communication challenges and practices in real project settings. Thus, the demographic profile demonstrates that the respondents are predominantly experienced, well-educated professionals working in small to medium-sized consultancy firms. This strengthens the credibility of the study findings, as the data are derived from individuals with substantial knowledge and practical involvement in construction project supervision and communication processes.

4.2. Supervising Consultant Role Factors Based on Company Leaders' Perceptions

The descriptive statistics of studied variables, measured using mean and standard deviation, along with their respective rankings based on respondents' perceptions.

Table 4. Result of Descriptive Statistics Analysis

Variable(s)	Mean	Std. Dev	Rank
Supervising Consultant Competence (X ₁)	4.720	0.298	1
Project Coordination (X ₆)	4.667	0.368	2
Communication Methods (X ₂)	4.659	0.33	3
Information Flow (X ₅)	4.652	0.324	4
Communication Management (X ₃)	4.616	0.383	5
Supervision Effectiveness (X ₄)	4.606	0.377	6

Table 4 shows that all variables have high mean values (above 4.60), indicating that respondents strongly agree on the importance of each factor in influencing communication effectiveness in construction projects. The results show that Supervising Consultant Competence (X₁) ranks first with the highest mean score of 4.720 and a relatively low standard deviation (0.298). This suggests that respondents consistently perceive consultant competence, such as mastery of contract documents, technical evaluation, and project understanding, as the most critical factor in enhancing communication effectiveness. The low variability further indicates a strong consensus among respondents regarding its importance.

The second-highest-ranked variable is Project Coordination (X₆), with a mean value of 4.667 and a standard deviation of 0.368. This finding highlights the importance of coordination among contractors and both internal and external stakeholders to ensure effective communication. Closely following is Communication Methods (X₂), ranked third with a mean of 4.659, emphasizing the relevance of two-way communication, personal interaction, and appropriate communication media in construction projects. Information Flow (X₅) ranks fourth with a mean score of 4.652, indicating that timely, accurate, and clear dissemination of project-related information plays a crucial role in communication effectiveness. Meanwhile, Communication Management (X₃), with a mean of 4.616, reflects the importance of teamwork, project understanding, and openness in communication processes.

Finally, Supervision Effectiveness (X₄) is ranked sixth, with the lowest mean of 4.606, although it still falls within a high-agreement level. This suggests that while supervision-related factors such as field presence and technical expertise are important, they are perceived as less influential than other communication-related factors. From the standard deviation values, all variables exhibit relatively low dispersion (ranging from 0.298 to 0.383), indicating that respondents' perceptions are consistent across all factors. This consistency strengthens the reliability of the descriptive findings. Thus, the results indicate that competence and coordination-related factors are perceived as the most dominant drivers, while managerial and operational factors remain important but slightly less prioritized. However, despite these high perceptions, further inferential analysis is necessary to determine whether these variables significantly influence communication effectiveness.

4.3. Correlation Analysis among studied variable(s)

Table 5. Result of Pearson correlation among variable(s)

Correlation(s)	Coefficient (r)	Strength of Correlation	Decision
Supervising Consultant Competence (X ₁) ↔ Communication Effectiveness	0.080	Very weak	Not significant
Communication Methods (X ₂) ↔ Communication Effectiveness	0.402	Moderate	Significant
Communication Management (X ₃) ↔ Communication Effectiveness	0.607	Strong	Significant
Supervision Effectiveness (X ₄) ↔ Communication Effectiveness	0.224	Weak	Not significant
Information Flow (X ₅) ↔ Communication Effectiveness	0.591	Moderate	Significant

Correlation(s)	Coefficient (r)	Strength of Correlation	Decision
Project Coordination (X ₆) ↔ Communication Effectiveness	0.295	Weak	Not significant

Table 5 shows the result of the Pearson correlation analysis. It indicates that several independent variables are significantly related to communication effectiveness (Y). Specifically, communication management (X₃) shows the strongest positive correlation (r = 0.607), indicating a strong relationship with communication effectiveness. This is followed by information flow (X₅) (r = 0.591) and communication methods (X₂) (r = 0.402), both of which demonstrate moderate and statistically significant relationships. In contrast, supervising consultant competence (X₁), supervision effectiveness (X₄), and project coordination (X₆) exhibit weak and statistically non-significant relationships with communication effectiveness, as their correlation coefficients are below the critical value (r-table = 0.344). Although all variables show a positive direction, indicating that improvements in these factors tend to enhance communication effectiveness, only X₂, X₃, and X₅ have a meaningful and statistically supported influence. These findings suggest that managerial and process-related factors (communication management and information flow) play a more critical role in determining communication effectiveness compared to technical or structural factors.

4.4. Hypothesis Testing

Table 6. Result of Hypothesis Testing

Variable(s)	Coefficient (β)	Std. Error	t-value	Sig.
Constant	0.221	1.073	0.206	0.839
Supervising Consultant Competence (X ₁)	0.134	0.157	0.851	0.402
Communication Methods (X ₂)	0.259	0.168	1.540	0.136
Communication Management (X ₃)	0.465	0.134	3.458	0.002
Supervision Effectiveness (X ₄)	-0.112	0.125	-0.899	0.377
Information Flow (X ₅)	0.306	0.172	1.782	0.086
Project Coordination (X ₆)	-0.093	0.140	-0.664	0.513

Dependent variable: Communication Effectiveness (Y)

The results of the multiple linear regression in Table 6 indicate that communication management (X₃) is the only variable with a positive, statistically significant effect on communication effectiveness (Y), with a regression coefficient of 0.465 and a p-value of 0.002 (p < 0.05). This suggests that improvements in communication management practices, such as teamwork, project understanding, and communication openness, significantly enhance communication effectiveness in construction projects. Although communication methods (X₂) and information flow (X₅) show positive coefficients (β = 0.259 and β = 0.306, respectively), their effects are not statistically significant at the 5% level, indicating that their influence is present but not strong enough to be conclusive. Similarly, supervising consultant competence (X₁) also shows a positive but insignificant effect. On the other hand, supervision effectiveness (X₄) and project coordination (X₆) exhibit negative coefficients, suggesting an inverse relationship with communication effectiveness; however, these effects are also statistically insignificant. This may indicate that these factors do not directly influence communication effectiveness or that their impact is mediated by other variables, such as communication management. The findings highlight that managerial and relational aspects of communication (X₃) play a more critical role than technical or structural factors in influencing communication effectiveness within construction projects.

5. Discussion

This study examined how different dimensions of the supervising consultant's role influence communication effectiveness in construction projects in Aceh. By integrating descriptive, correlation, and regression analyses, the findings provide a nuanced understanding of which factors are perceived as important and which actually exert statistically significant influence. The descriptive results indicate that all factors are perceived as highly important (means > 4.60), with supervising consultant competence (X₁) ranked highest. This aligns with prior studies emphasizing the importance of technical knowledge and professional capability in construction communication (Zulch, 2016; Mavuso & Agumba, 2016). However, a key insight emerges when comparing descriptive and inferential results: high perceived importance does not necessarily translate into statistical influence.

The regression analysis reveals that communication management (X_3) is the only variable that significantly affects communication effectiveness ($p = 0.002$). This finding highlights that how communication is managed through teamwork, openness, and shared understanding is more critical than individual competence alone. This result is consistent with studies by Yap and Yu (2025), who emphasize structured communication strategies, and Ismail et al. (2024), who highlight the importance of cooperation, feedback, and communication culture. Similarly, the correlation analysis shows that communication management (X_3), information flow (X_5), and communication methods (X_2) are positively and significantly correlated with communication effectiveness. These findings reinforce the argument that process-oriented and relational factors play a more decisive role than structural or technical factors. This supports earlier findings by Aziz et al. (2022) and Yap et al. (2026), which highlight that communication effectiveness depends on clarity, timeliness, and proper communication channels.

An interesting finding is that supervising consultant competence (X_1), supervision effectiveness (X_4), and project coordination (X_6) do not have a statistically significant effect on communication effectiveness, despite their high mean values. This apparent contradiction suggests that these factors may function as baseline or enabling conditions, rather than direct drivers of communication effectiveness. For instance, competence may be necessary for performing tasks, but without effective communication management, it does not automatically lead to better communication outcomes. This finding challenges the assumption in earlier studies that technical expertise alone can improve project performance (Setiawan et al., 2021). Similarly, the non-significant effect of supervision effectiveness suggests that physical presence and technical oversight are insufficient without strong communication processes.

The negative coefficients for X_4 (supervision effectiveness) and X_6 (project coordination), although not significant, may indicate inefficiencies in their implementation. Poorly managed coordination or overly rigid supervision structures could potentially hinder communication, as also suggested by Arof (2020), who highlights ineffective meetings and a lack of stakeholder representation as communication barriers. The dominance of communication management (X_3) as the only significant predictor underscores its role as the core mechanism through which other factors influence communication effectiveness. This finding is strongly supported by the literature. Fateh et al. (2023) identify communication management as a key factor in reducing communication breakdown, while Alrasheed et al. (2026) emphasize the importance of structured communication planning for improving project outcomes.

From a theoretical perspective, this suggests that communication effectiveness in construction projects is less about individual capabilities and more about systemic interaction processes. In other words, communication management acts as a mediating mechanism that translates competence, coordination, and information into effective communication outcomes. The findings have several important practical implications. First, construction organizations, particularly supervision consultancy firms, should prioritize strengthening communication management practices, including fostering teamwork, encouraging open communication, and ensuring shared understanding among stakeholders.

Second, while technical competence and coordination remain important, they should be integrated within a structured communication framework. This includes the use of formal communication plans, regular and effective meetings, and appropriate communication channels, as recommended by Yap and Yu (2025). Third, training programs should focus not only on technical skills but also on soft skills, such as communication, collaboration, and conflict management. This aligns with the findings of Suleiman (2022) and Olanrewaju et al. (2017), which highlight the importance of interpersonal factors in construction communication. This study contributes to the construction management literature by providing empirical evidence on the role of supervising consultants as communication facilitators. Unlike previous studies that focus on general communication factors, this study demonstrates that communication management is the most critical determinant, while other factors play supporting roles. Furthermore, the findings bridge the gap between theory and practice by showing that not all theoretically important factors have direct statistical effects, thereby highlighting the need to distinguish between perceived importance and actual influence.

6. Conclusions

This study aimed to analyze the role of supervising consultants in enhancing communication effectiveness in construction projects in Aceh, Indonesia. By employing a quantitative approach and integrating descriptive, correlation, and multiple linear regression analyses, the study provides empirical insights into the factors influencing communication effectiveness within construction supervision practices. The findings indicate that all examined variables, including supervising consultant competence, communication methods, communication management, supervision effectiveness, information flow, and project coordination, are perceived as important by respondents, as reflected by their high mean values. However, further statistical analysis indicates that only communication management (X_3) has a significant, positive influence on communication effectiveness. This highlights that factors such as teamwork,

communication openness, and shared understanding of the project play a central role in facilitating effective communication among project stakeholders.

In contrast, variables such as supervising consultant competence, supervision effectiveness, and project coordination, although highly rated in descriptive analysis, do not show a statistically significant effect. This suggests that these factors function as supporting conditions rather than direct determinants of communication effectiveness. The findings emphasize that technical competence and structural coordination alone are insufficient without well-managed communication processes. Theoretically, this study contributes to the construction management literature by demonstrating that communication effectiveness is primarily driven by managerial and relational processes rather than purely technical or structural factors. It also highlights the critical role of supervising consultants as communication facilitators who must not only possess technical expertise but also actively manage communication dynamics within projects.

From a practical perspective, the study suggests that construction organizations should prioritize strengthening communication management practices, including fostering collaboration, ensuring information clarity, and promoting open communication among stakeholders. Training and professional development programs should also emphasize soft skills and communication competencies alongside technical capabilities. In addition, construction organizations should implement structured communication management strategies to enhance project coordination and information flow. This includes developing formal communication plans that clearly define roles, responsibilities, communication channels, and reporting procedures among stakeholders. Regular coordination meetings with well-defined agendas and documented outcomes should be conducted to ensure alignment and accountability. Furthermore, the use of standardized communication protocols and digital tools, such as project management platforms, shared dashboards, or real-time reporting systems, can improve the accuracy, timeliness, and transparency of information exchange. Encouraging a culture of open communication, timely feedback, and collaborative problem-solving is also essential to minimize misunderstandings and strengthen stakeholder relationships.

Despite its contributions, this study is limited by its relatively small sample size and its focus on a specific regional context. Therefore, future research is recommended to expand the scope by including larger and more diverse samples, applying advanced analytical methods such as Structural Equation Modeling (SEM), and exploring potential mediating or moderating variables. This study demonstrates that effective communication in construction projects is not merely a function of individual competence or structural arrangements, but is fundamentally shaped by how communication is managed. Strengthening communication management practices is therefore essential for improving project coordination, reducing misunderstandings, and achieving successful project outcomes.

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References

Akunyumu, S., Adjei-Kumi, T., Danku, J. C., & Kissi, E. (2019). Communication problems in projects: A research study for construction site projects: A case study of Ghana. *International Journal of Project Organisation and Management*, 11(4), 343–361. <https://doi.org/10.1504/IJPOM.2019.103496>

- Alrasheed, K., Hassaneiah, S., & Alselahi, N. S. (2026). Improving project outcomes through effective communication: A quantitative study of causes and solutions in Kuwait's construction industry. *Journal of Engineering Research*. <https://doi.org/10.1016/j.jer.2026.01.001>
- Arof, K. Z. M. (2020). Causative failure factors of communications management in mixed-use development projects in Malaysia. *Journal of Critical Reviews*, 7(5), 82–86.
- Aziz, N. A., Mohd Rahim, F. A., & Aziz, N. M. (2022). Systematic literature review on communication in construction project management: Issues among project participants. *Journal of Surveying, Construction & Property*, 13, 52–70. <https://doi.org/10.22452/jscp.sp2022no1.5>
- Fateh, M. A. M., Arshad, R. A., Marzuki, S. M. A., & Yusof, M. R. (2023). Improvements of the communication between consultants and contractors during the construction phase in Malaysia. *Planning Malaysia*, 21(26), 80–103.
- Ishaq, I. M., Omar, R., & Mohammed, M. (2018). Challenges of communication between the client and contractor during construction projects: The Nigerian perspective. *International Journal of Engineering and Modern Technology*, 4(2), 20–29.
- Ishaq, I. M., Omar, R., Yahya, M. Y., & Sarpin, N. (2019). Improving communication between client and contractor during construction project in Nigerian construction industry. *Journal of Technology Management and Business*, 6(3), 60–75.
- Ismail, W. N. W., Adnan, H., Isa, S. S. M., Jenuwa, N., & Yusop, N. (2024). Assessment on the factors influencing ineffective communication among stakeholders in infrastructure development. *Planning Malaysia*, 22(2), 32–44.
- Mavuso, N. M., & Agumba, J. N. (2016). Factors of communication management for successful project delivery in the Swaziland construction industry. In *Proceedings of the 9th Annual Quantity Surveying Research Conference* (pp. 16–25), Port Elizabeth, South Africa, October 19–21.
- Olanrewaju, A., Tan, S. Y., & Kwan, L. F. (2017). Roles of communication on performance of the construction sector. *Procedia Engineering*, 196, 763–770. <https://doi.org/10.1016/j.proeng.2017.08.001>
- Quan, B. L. T., Noh, N. I. F. M., Lin, N. J., Ahmad, Z., Chai, L. J., Surol, S., ... Razman, R. (2022). Effects of poor communication in the construction industry in Klang Valley, Malaysia. *Jurnal Kejuruteraan*, 34(5), 837–841. [https://doi.org/10.17576/jkukm-2022-34\(5\)-07](https://doi.org/10.17576/jkukm-2022-34(5)-07)
- Setiawan, A. F., Hansen, S., & Fujiono, A. (2021). Measuring the influence of communication planning towards construction project performance. *Civil and Environmental Engineering*, 17(1), 58–65. <https://doi.org/10.2478/cee-2021-0006>
- Suleiman, A. (2022). Causes and effects of poor communication in the construction industry in the MENA region. *Journal of Civil Engineering and Management*, 28(5), 365–376. <https://doi.org/10.3846/jcem.2022.16884>
- Suleiman, A., Almasaeid, H., Hussein, N., & Abahre, J. (2023). Addressing the causes and effects of poor communication in the Jordanian construction industry: A study on improving project performance. *Civil and Environmental Engineering*, 19(1), 156–166. <https://doi.org/10.2478/cee-2023-0015>
- Yap, J. B. H., & Oo, J. H. (2025). Silent failures: Uncovering the root causes of poor communication in Malaysian construction projects. *Journal of Construction in Developing Countries*, 30(2), 109–136.
- Yap, J. B. H., & Yu, C. Y. (2025). Essential needs and strategies for effective contractor communications: Bridging gaps in Malaysia's construction industry. *International Journal of Construction Education and Research*, 1–24.
- Yap, J. B. H., Yu, C. Y., Skitmore, M., & Lee, C. Y. (2026). Lost in transmission: Uncovering communication barriers in construction through the contractor's lens. *International Journal of Construction Management*, 1–19.
- Zulch, B. G. (2016). A proposed model for construction project management communication in the South African construction industry. *Acta Structilia: Journal for the Physical and Development Sciences*, 23(1), 1–35.