









Enhancing Worker Productivity Through Effective Communication Management: Evidence from a Housing Construction Project

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ABSTRACT

Communication plays a very important role in coordinating activities among various stakeholders in construction projects. Misunderstandings, work repetition, schedule delays, and decreased worker productivity are issues that occur as a result of ineffective communication. This study aims to examine the effect of communication management quality on worker productivity in a housing construction project, namely the Citraland Sampali Housing Development Project in Medan. This research adopts a quantitative approach using a questionnaire method distributed to 37 respondents, consisting of project managers, site supervisors, and construction workers. The collected data were analyzed using descriptive statistics and simple linear regression with the assistance of SPSS software. The results of the study indicate that the average score of communication management quality in the project is 3.91 and worker productivity is 3.89, both of which are included in the good category. Meanwhile, the results of the regression analysis show that worker productivity is significantly influenced by communication management, with an R^2 value of 0.508, where 50.8% of the variation in worker productivity can be explained by the quality of communication management. These findings explain that the implementation of a structured communication system can

improve project performance.

Keywords: *Communication Management, Construction Productivity, Housing Project, Project Management, Worker Productivity*

1. Introduction

The growth of the construction industry in Indonesia in recent years has experienced a fairly rapid increase, one of which is indicated by the rising number of infrastructure and housing development projects. With this relatively rapid growth, several demands have emerged to ensure the successful implementation of construction projects, one of which is the application of effective project management. This is necessary because as project complexity increases, project stakeholders also require effective coordination to achieve project objectives related to time, cost, and quality. Therefore, effective project management becomes a basic requirement to ensure the success of a construction project [1], [2].

Among the various fields of knowledge in project management, one of the most important roles is communication management, which functions as the primary means for delivering work instructions, coordinating tasks, and resolving problems among parties involved in the project. The Project Management Institute states that one of the main causes of project failure is ineffective communication [1]. Several previous studies have shown that poor communication in construction projects often results in errors in the form of misunderstandings of work instructions, rework, schedule delays, and interpersonal conflicts, which ultimately



reduce worker productivity and overall project performance [3], [4].

Worker productivity is one of the main performance indicators in construction projects because it directly affects work quality, cost efficiency, and project duration. Numerous studies have been conducted to examine the factors influencing worker productivity, including managerial, environmental, and technical aspects [5], [6]. However, in general, these studies tend to focus on productivity factors at the macro level, while empirical research that specifically examines the quality of communication management, particularly in housing construction projects, remains limited.

In several studies conducted in Indonesia, research that discusses communication management practices and worker productivity at the project level is still relatively limited. Some studies only discuss communication as a supporting factor without presenting empirical evidence regarding the influence of communication management on productivity, thereby limiting the ability of project managers to prioritize communication management in construction projects.

Communication is often treated as a secondary variable in construction projects, although several studies have examined factors that influence worker productivity. Research on the quantitative measurement of communication management in construction projects in Indonesia, particularly in housing construction projects, is still limited. Therefore, this study attempts to fill this gap by positioning communication management as the main variable that is measurable in relation to productivity.

Based on preliminary observations at the Citraland Sampali housing development project in Medan, communication-related problems were identified, including unclear delivery of instructions from supervisors and inconsistent information dissemination, which resulted in misunderstandings among workers. These conditions need to be evaluated so that the management practices implemented in the project can be improved. Therefore, this study aims to analyze the effect of communication management quality on worker productivity in order to provide empirical evidence as well as practical input for construction project management in Indonesia.

2. Method

2.1 Research Design

This research analyzes the relationship between communication management quality and worker productivity in a housing construction project using a quantitative approach with an associative research design. The quantitative approach was selected because it allows research variables to be measured numerically and analyzed statistically to examine cause-and-effect relationships in construction management studies, thereby enabling an objective and systematic evaluation of relationships among variables.

The identification of the influence of communication management quality on worker productivity is carried out through an associative research design, which not only describes existing conditions but also explains how variations in communication management quality may affect productivity outcomes. Thus, the role of communication management in construction project performance can be empirically demonstrated.

The study was conducted at the Citraland Sampali Housing Development Project in Medan City, which involves various stakeholders and complex processes. Therefore, effective communication management is critically required during the construction phase. The main focus of the study is on communication practices and productivity conditions observed throughout ongoing construction activities.

2.2 Data Collection

Primary data in this study were obtained through a questionnaire survey that was developed based on a literature review related to project communication management, worker productivity, and construction project management. To ensure that each statement in the questionnaire has a strong theoretical foundation and is relevant to construction project conditions in Indonesia, the questionnaire was developed with reference to the Project Management Body of Knowledge (PMBOK).

The questionnaire consists of several statement items measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This measurement scale provides sufficient variation in responses for statistical analysis and enables the structured and quantitative capture of respondents' perceptions.



An item is considered valid if the calculated correlation coefficient (r_{count}) is greater than the critical value (r_{table}) at a significance level of 5%.

Before distributing the questionnaire, the items were carefully reviewed to ensure clarity, consistency, and suitability for respondents with different roles and educational backgrounds. The questionnaire was then distributed directly to respondents involved in the project to ensure a higher response rate and accurate representation of actual project conditions.

The population of this study comprised 59 individuals actively involved in the Citraland Sampali Housing Development Project, including project managers, site engineers, supervisors, foremen, and construction workers. To determine an appropriate sample size, the Slovin formula was applied with a margin of error of 10%. The Slovin formula is expressed as follows:

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

where n defines sample size, N the population size and e denotes margin of error.

By substituting the population size ($N = 59$) and the margin of error ($e = 0.10$) into the formula, a sample size of 37 respondents was obtained. A simple random sampling technique was employed to minimize sampling bias and to provide equal opportunity for all population members to be selected as respondents.

2.3 Research Variables

This study examined two main variables, namely communication management quality as the independent variable and worker productivity as the dependent variable. The selection of these variables was based on theoretical considerations and previous research findings indicating a strong relationship between communication effectiveness and worker performance in construction projects.

Communication management quality was measured using several indicators, including communication planning, information distribution, work reporting, and stakeholder communication. Worker performance, management support, technical conditions, and work environment are several indicators used to assess worker productivity. Worker performance reflects the level of efficiency and effectiveness of workers in completing assigned tasks in accordance with project requirements. Management support includes the quality of supervision, guidance, and motivation provided by project management. The availability and adequacy of tools, equipment, and construction methods refer to technical conditions in the field. The work environment encompasses physical, organizational, and safety conditions that influence workers' ability to perform their tasks effectively.

2.4 Data Analysis

2.4.1 Validity Test

Validity testing was conducted to determine whether each questionnaire item was capable of measuring the intended construct. The validity test was performed using the Pearson Product Moment correlation, which examines the correlation between individual item scores and the total variable score. The formula used is expressed as follows:

$$r_{xy} = \frac{n(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{n(\sum X^2)\}\{n(\sum Y - \sum Y^2)\}}} \quad (2)$$

where r defines the correlation coefficient, n the number of respondents, X the item score and Y refers to the total score.



2.4.2 Reliability Test

Reliability testing was performed to assess the internal consistency of the questionnaire items using Cronbach's alpha coefficient. The reliability formula is expressed as follows:

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_i^2}{\sigma_x^2} \right) \quad (3)$$

where α denotes the Cronbach's alpha coefficient, k the number of items, σ_i^2 the variance of each item and σ^2 defines the total variance. A variable is considered reliable if the Cronbach's alpha value exceeds 0.70.

2.4.3 Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to summarize respondents' characteristics and to describe the overall condition of communication management quality and worker productivity. The mean value was calculated using the following formula:

$$X^5 = \frac{\sum X}{n} \quad (4)$$

where X^5 , X and n represent the mean score, the respondent score and the number of respondents, respectively. Hen interpreted based on predefined Likert scale categories.

2.4.4 Simple Linear Regression Analysis

To examine the effect of communication management quality on worker productivity, a simple linear regression analysis was conducted. The regression model used in this study is expressed as follows:

$$Y = \alpha + Bx + e \quad (5)$$

with Y defining the worker productivity, X communication management quality, α a constant and B being a regression coefficient.

The test was conducted using a t-test with a significance level of 5% to determine whether the communication management variable has a significant effect on the worker productivity variable.

Simple linear regression was chosen in this study because the study only tests one independent variable. This approach is used so that the analysis is more focused on the direct relationship between the two main constructs.

2.4.5 Coefficient of Determination

The analysis of the coefficient of determination is intended to determine the extent of the relationship or contribution of the independent variable (Communication Management) to the dependent variable (Worker Productivity). The formula for the coefficient of determination is expressed as:

$$R^2 = \frac{SSR}{SST} \quad (6)$$

where SSR expresses the regression sum of squares and SST defines total sum of squares.



3. Results and Discussion

3.1 Respondent Characteristics

This study involved respondents who were directly engaged in the implementation and management of the Citraland Sampali Housing Development Project. The respondents consisted of several functional positions responsible for planning, supervision, logistics, administration, and the implementation of on-site construction activities. The selection of respondents was based on the responsibilities of each party to ensure that the data collected could reflect how communication practices are implemented in the project.

Table 1. Respondent Characteristics

Position	Number of Respondents
Project Manager	1
Site Manager	1
Logistics Staff	1
Foreman	1
Plumbing Worker	1
Administration Staff	1
Construction Workers	31
Total	37

The composition of respondents indicates that the majority were construction workers, reflecting the worker-intensive nature of housing construction projects. This distribution ensures that productivity-related perceptions are adequately captured while still incorporating managerial viewpoints.

3.2 Descriptive Statistics of Research Variables

Descriptive statistical analysis was conducted to evaluate the implementation level of communication management quality and worker productivity at the project site. The analysis provides an overview of respondents' perceptions based on the indicators measured using a five-point Likert scale.

Table 2. Descriptive Statistics of Communication Management Quality and Worker Productivity

Variable	Indicator	Mean	Category
Communication Management Quality	Communication Planning	4.02	Good
	Information Distribution	3.98	Good
	Work Reporting	3.87	Good
	Stakeholder Communication	3.78	Good
	Overall Mean	3.91	Good
Worker Productivity	Labor Capability	3.95	Good
	Management Support	3.92	Good
	Technical Factors	3.88	Good
	Work Environment	3.82	Good
	Overall Mean	3.89	Good

The results of the descriptive analysis for the communication management variable obtained an average score of 3.91. This indicates that communication management at the Citraland Sampali Housing Development



Project has generally been well implemented through a relatively clear and systematic information flow system.

The results of the descriptive analysis for the worker productivity variable obtained an overall average score of 3.89, which is also categorized as good. This indicates that workers are generally able to carry out their tasks efficiently; however, there are still several indicators related to coordination and the work environment that obtained relatively lower scores.

3.3 Effect of Communication Management Quality on Worker Productivity

To examine the influence of communication management quality on worker productivity, a simple linear regression analysis was conducted. Communication management quality was treated as the independent variable, while worker productivity served as the dependent variable.

Table 3. Simple Linear Regression Results

Variable	Coefficient (B)	Std. Error	t-Value	Sig.
Constant	1.214	0.412	2.948	0.005
Communication Management Quality	0.683	0.097	7.041	0.000

Table 4. Model Summary

R	R Square (R ²)	Adjusted R ²	Std. Error of Estimate
0.713	0.508	0.494	4.307

The results of the regression analysis indicate the presence of a positive and statistically significant relationship between communication management quality and worker productivity ($p < 0.05$). The regression coefficient value of 0.683 shows that the better the communication management implemented, the higher the tendency for worker productivity to increase.

In addition, the communication management variable is proven to have a considerable influence on worker productivity, with a coefficient of determination value of 0.508 or 50.8%. This means that 50.8% of the variation in worker productivity can be statistically explained by communication management quality, while the remaining 49.2% is influenced by other factors not included in this model. Meanwhile, the remaining 49.2% is influenced by other factors outside the scope of this study, such as worker experience, motivation level, project site conditions, and the availability of work equipment.

3.4 Discussion

The findings confirm that that effective communication management can improve workers' understanding of work procedures, project objectives, and job requirements [7], [8], [9]. Clear and consistent communication can reduce uncertainty, minimize errors, prevent unnecessary rework, and enable smoother coordination between supervisors, foremen, and workers, thereby allowing problems in the field to be resolved more quickly [10], [11].

From a theoretical perspective, this study strengthens construction management literature by providing empirical evidence that communication management has a direct and measurable impact on worker productivity.

From a practical standpoint, the results of this study suggest that project managers should prioritize communication management through strengthening feedback mechanisms, improving effective communication planning, and standardizing reporting, such as conducting regular coordination meetings and providing clear supervisory instructions in order to increase overall project productivity and efficiency [10], [11].

3.5 Limitations and Future Research

This study is limited to a single housing construction project, which may restrict the generalizability of the



research findings. In addition, the analysis in this study focuses only on communication management quality, while other factors related to productivity have not been explicitly examined. In addition, this study uses self-reported questionnaire data. Future studies are expected to combine observational data with productivity measurements to improve the research results.

Future research is expected to involve multiple projects with different characteristics and to include additional variables such as worker motivation and technological support systems, so that more complex relationships regarding the influence of work productivity in construction projects can be analyzed.

3.6 Managerial Implications

These findings provide several managerial implications for construction project practitioners, such as the need for structured communication planning from the beginning of the project to be prepared by the project manager so that the project has a clear reporting mechanism. By strengthening communication management practices in the project, construction companies are expected to improve overall productivity.

4. Conclusion

This study concludes that the quality of communication management implemented in the Citraland Sampali housing project has a significant and positive influence on worker productivity and is generally categorized as good. These results indicate that the communication system applied in the project has been effective in supporting coordination and task execution among project participants.

The results of the regression analysis show that 50.8% of the communication management variable influences worker productivity. This relatively large value indicates that communication management has a substantial role in workforce performance at construction sites in the form of clearer understanding of work instructions, improved coordination between supervisors and workers, and reduced occurrences of errors, rework, and delays. Therefore, one of the most influential managerial factors affecting productivity in housing construction projects is communication management.

Although the research results generally show positive findings, this study also indicates that there are several aspects of communication management that still require improvement related to the clarity and consistency of instructions, coordination among work teams, and feedback mechanisms. These aspects need to be improved to increase productivity and minimize inefficiencies during project implementation. Project managers are also expected to pay greater attention to communication management aspects in the field so that information flow can be conveyed clearly, responsibilities can be assigned to competent parties, and communication channels can be properly established. Overall, this study serves as empirical evidence of the importance of implementing communication management strategies in construction projects.

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6. Conflict of Interest

The author declares no conflict of interest related to this study.

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