



The Influence of Craftsmen's Experience on Construction Project Productivity in the Cirebon Region

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ABSTRACT

This study examines the influence of craftsmen's experience on construction project productivity in Cirebon. Using a productivity rating method based on perception, productivity was quantitatively measured through foreman observations. The results indicate that craftsmen's experience has a significant influence, contributing 40.4% to productivity. A strong positive correlation ($\rho = 0.557$) was also found between experience and work quality, indicating that more experienced workers tend to be more productive and efficient. The implications of this study emphasize that workers' experience is a key factor in achieving optimal productivity. Additionally, work quality, safety, and discipline are essential elements that must be considered to enhance project success.

INTRODUCTION

Productivity is a key factor in the success of construction projects, where labor, particularly skilled workers, plays a central role. Productivity is defined as the ability of an individual or workforce to produce output within a specific unit of time (Harun, 2013; Faustine & Waty, 2022; Faradina, 2021; Bora, 2021). The level of experience of craftsmen significantly influences productivity, as experience reflects technical skill mastery and work efficiency (Sugiharto, 2006).

This study employs a productivity rating method based on perception, which allows foremen to directly observe and evaluate workers' productivity based on their experience. This method facilitates quantitative and objective productivity measurement, taking into account various factors including experience and work quality. The advantages of this method, as revealed by Sujana & Hakim (2021), include cost efficiency, ease of application, good statistical accuracy, and minimal disruption to work activities.

LITERATURE REVIEW

Construction projects are activities whose outcomes are influenced by labor productivity, involving interrelated tasks that require careful management of costs, quality, and time, along with control of resources such as labor and materials (Belferik et al., 2023).

Construction labor productivity, defined as the ratio of construction output to labor input, represents the output of labor created per unit of time or the time spent per unit of product, categorized into physical and value-added labor productivity (Wibowo, 2022).

Construction Project

According to (Al-Farisi, 2023), a construction project is a series of organized activities to plan, design, build, and maintain a physical structure or facility. This project involves various disciplines and skills, including architecture, civil engineering, project management, structural engineering, and others. The main objective of construction projects is to produce structures or facilities that meet the specified requirements and specifications.

Construction projects are high-risk projects with high complexity, uncertainty, and ultimately various risks. Unidentified and unaddressed risk factors in project implementation can result in obstacles in achieving project objectives in terms of time, cost, and quality (Pattiraja et al., 2024).

The Influence of Productivity in Construction

Productivity in construction projects is a measure of the efficiency of labor in completing work based on the inputs used (time, labor, materials) compared to the outputs produced (volume of work). Productivity is influenced by internal factors (such as discipline, skills, work experience) and external factors (such as weather conditions, management systems, and support from tools and materials) (Thoengsal & Mediatama, n.d.).

Soepardi Harris, Bambang Perkasa Alam, and Arief Nugroho Wibowo (Harris et al., 2017) found that low work productivity can cause delays in the

implementation of construction projects. Factors such as education, expertise, age, working hours, and project location affect the level of worker productivity, which in turn affects the timeliness of project completion.

Work experience is one of the important factors that influence the performance and productivity of workers in a construction project. In general, work experience can be defined as the amount of time or duration that a person is involved in a particular field of work, so that the individual acquires skills, knowledge, and practical understanding from activities carried out continuously. In a study by Sujana & Hakim (2021), it was found that the work experience of ironworkers influenced their productivity in ironwork on high-rise building projects in Surabaya. This study used observation and multiple linear regression analysis to identify factors that influence the productivity of ironworkers, including work experience.

According to Sitorus et al., (2023), work experience is the accumulation of knowledge and skills gained through direct involvement in the performance of a job over a certain period of time. The longer someone works in a particular field, the more likely they are to understand work procedures, potential problems, and appropriate technical solutions in completing their tasks.

(Faradina, 2021) also states that work experience in the construction field plays a significant role in determining the quality and speed of work execution. Experienced workers tend to be able to work more independently, have better work accuracy, and adapt to dynamic field conditions.

Construction Workers in Construction Projects

Craftsmen are the main workforce in the physical implementation of construction projects. They are directly involved in various jobs such as structure, architecture, and finishing. The role of craftsmen is crucial because they are the final implementers of the designs created by planners and engineers. Common types of craftsmen include bricklayers, carpenters, ironworkers, painters, and welders.

The productivity of craftsmen greatly affects the time and cost of a project. According to (Pandji & Haryono, 2000), the productivity of craftsmen is influenced by technical skills, work experience, motivation, and management support. Recent research by (Firmansyah et al., 2022) shows that the productivity difference between certified and uncertified workers is quite significant, especially in wall and concrete structure work. For example, the productivity of stone masons in Palembang ranges from 0.54–0.69 m²/person/hour depending on experience and training.

Perception-Based Productivity Rating Method

According to (MAHARTIAN, 2021), the productivity rating method assesses productivity by calculating the volume of work completed per unit of time, then comparing it to a predetermined standard or average productivity. This method is often used in construction projects due to the

labor-intensive and repetitive nature of field work, such as ironwork, formwork, and concrete pouring.

According to (Sujana & Hakim, 2021), this method has several advantages, such as no equipment costs, no special skills required, better statistical accuracy, no disruption to workers while they are performing their duties, and data that is more realistic because it is based on direct observation.

METHODOLOGY

Research Flow

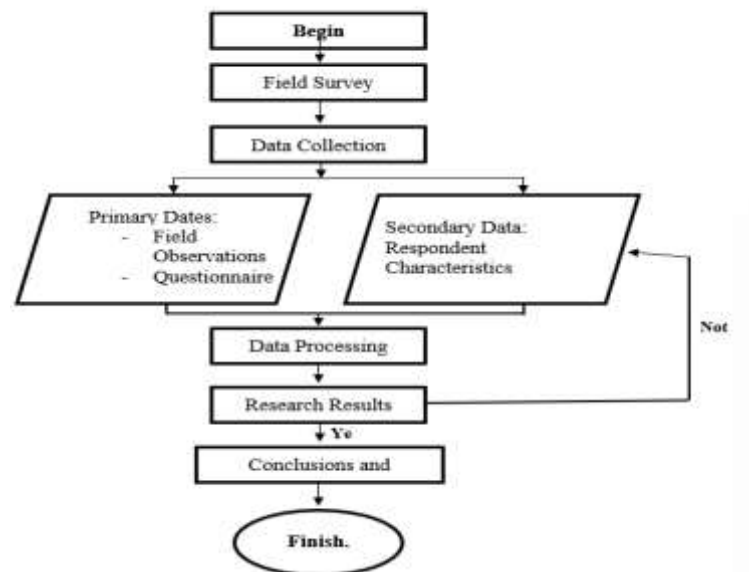


Figure 1. Research Flow Diagram

Data

This study adopts a mixed-data approach, utilizing primary and secondary data. Primary data was collected through questionnaires distributed to project foremen. The questionnaires were designed to obtain the foremen's perceptions of the level of experience of the workers and work productivity, with measurements using a Likert scale (1–5) and statistical analysis through SPSS.

Productivity Rating Approach Based on Perception

Productivity Rating is a method of assessing worker performance based on direct observation of speed, accuracy, skills, experience, and work results over a specific period (Sujana & Hakim, 2021). The advantages of this method include cost efficiency, ease of application, good statistical accuracy, minimal disruption to workers, and the collection of more realistic data.

This study also uses the Likert Scale to measure attitudes, opinions, and perceptions. Research variables are broken down into indicators, which are then converted into questions or statements. Respondents respond with options ranging from "strongly agree" to "strongly disagree," which are then scored for quantitative analysis (Sugiyono, 2013; Pratama, 2024).

Data Analysis

This study involved 60 foremen as respondents, selected using purposive sampling from 30 different building construction projects in Cirebon. The selection criteria were based on the active role of the foremen in leading the project, ensuring a functionally representative sample of experience and supervisory roles in the field.

Statistically, although the Cochran formula with a 95% confidence level and a 5% margin of error initially estimated 384 respondents, and after correction for a limited population (100 active foremen in Cirebon) decreased to 79, the use of 60 respondents was still considered valid and adequate. This number even exceeds the minimum standard in quantitative social research and aligns with the median sample size (60) in similar quantitative studies based on recent literature (Totton et al., 2024; BioMed Central).

This study employs a quantitative data analysis methodology. The purpose of quantitative research methodology is to objectively describe and measure the issues under investigation. Identifying correlations between variables is the objective of quantitative research, which includes surveys related to research findings. The purpose of this study is to gain an understanding of a particular subject or problem in order to understand the causes of the problem.

In quantitative research, (Sugiyono, 2013) states that data analysis is an activity conducted after data from all respondents or other data sources have been collected. In this study, data analysis techniques were conducted in various ways, including the following:

Validity Test

Using the product moment formula, statistical analysis is conducted to compare the score of each item with the overall score to assess the validity of the research instrument. The findings of this analysis produce validity indicators that are classified as valid or invalid.

$$r_{xy} = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}}$$

Reliability Test

To ensure that the questionnaire is reliable and produces consistent results when used again, a reliability test was conducted. Cronbach's Alpha method can be used with SPSS version 22 for reliability testing.

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum_{i=1}^k \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

After that, Descriptive Statistics were used to test the generalization of research results from one sample by analyzing the mean, standard deviation, minimum value, and maximum value of the variables. To ensure the regression model is valid and reliable, crucial Classical Assumption Tests

were conducted. These include the Normality Test using the One-Sample Kolmogorov-Smirnov test to ensure the data distribution is normal ($\geq$ significance value 0.05).

Furthermore, the Linearity Test examines the linear relationship between variables, while the Multicollinearity Test ensures that there are no overly strong relationships between independent variables that could disrupt the stability of the model. In addition, the Correlation Test is conducted to identify the relationship, strength, and direction between two or more variables, such as between the experience of craftsmen and project productivity.

This study also delves into the Relationship of Main Variables (Total Carpenter Experience as the X variable and Carpenter Productivity as the Y variable) through Pearson Correlation Test and Simple Linear Regression Test. Furthermore, the relationship between each dimension of the X variable and the Y variable is analyzed, measuring the correlation and influence of each dimension of the carpenter's experience (Skills and Knowledge, Work Quality) on productivity using Pearson Correlation Tests per Dimension and Simple Linear Regression Tests per Dimension.

Finally, Multiple Linear Regression was applied to determine the simultaneous and partial effects of various independent variable dimensions (Skills and Knowledge, Impact on Work Quality, Discipline and Safety) on craftsmen productivity. Hypothesis testing was conducted using the F-test (Simultaneous) to examine the combined influence of independent variables and the t-test (Partial) to assess the individual influence of each independent variable on the dependent variable. All statistical tests were performed using SPSS software.

RESEARCH RESULT

This study was conducted in the Cirebon area, focusing on building construction projects. Field observations involved a total of 60 workers, consisting of foremen, supervisors, and laborers. The sample was spread across 30 different building construction projects. The results were based on the respondents' age, experience, and position. Based on the data collected, the majority of respondents were in the productive age range. The 41–50 age group was the largest with 23 people (38%), followed by the 31–40 age group with 18 people (30%). Respondents aged 30 years and below numbered 13 people (22%). Meanwhile, the proportion of respondents aged 51–60 years is 4 people (7%), and only 2 people (3%) are over 60 years old. With an average age of 40 years, this data indicates that most workers have a high level of maturity and are at their optimal stage.



Figure 2. Diagram of Respondents' Experience

The data shows that the majority of respondents have substantial work experience. A total of 41 respondents, or approximately two-thirds of the total respondents, have worked for more than 10 years. Respondents with 5–10 years of work experience number 12, while only 7 have work experience of 5 years or less. With an average work experience of 14.1 years across all respondents, this reflects a high level of work experience among the project supervisors who are the subject of this study.

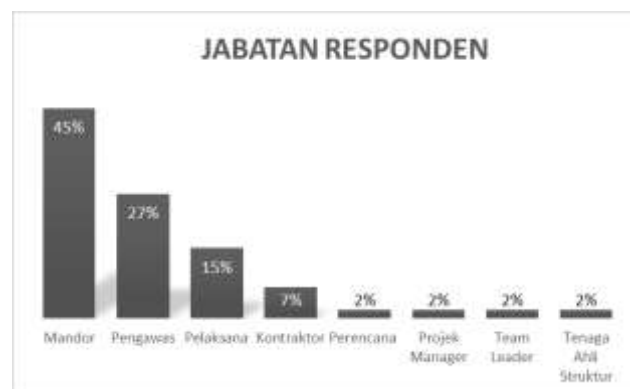


Figure 3. Graph of Respondents' Positions

Based on the characteristics of the respondents in this study, it can be concluded that the majority of respondents are of productive age with an average age of 40.28 years and have considerable work experience, with an average of 14.1 years. The most common position held by respondents is that of foreman (45%), who are directly involved in the implementation of construction projects, followed by supervisors and implementers. In terms of educational background, most respondents come from an engineering field, particularly holding a Bachelor of Engineering (B.Eng) degree, indicating that respondents possess adequate technical understanding of fieldwork.

Descriptive Statistics of Research Variables

This study examines the relationship between two main variables: Experience (X) as the independent variable and Productivity (Y) as the dependent variable. The experience variable (X) is further broken down into three dimensions: Skills & Knowledge, Job Quality, and Safety & Discipline. Overall, this study uses 30 statement indicators to measure both variables. Specifically, to describe respondents' work experience, 24 statement indicators are used, divided into the same three dimensions as variable X, namely Skills and Knowledge of Tradespeople, Impact on Work Quality, and Safety and Discipline Aspects. These indicators serve to identify respondents' characteristics based on their work experience, as presented in more detail in Table 1.

Table 1. Variable X

VARIABLE	STATEMENT	REFERENCE
SKILLS AND KNOWLEDGE OF WORKERS		
X1.1	Experienced craftsmen have better on-the-job knowledge than inexperienced craftsmen.	(Rizal et al., 2020)
X1.2	Lack of work motivation affects the productivity of craftsmen in construction projects.	(Faustine & Waty, 2022)
X1.3	Misunderstandings among workers affect productivity in construction projects.	(Faustine & Waty, 2022)
X1.4	Workers' skills influence work outcomes, but they are not the only factor.	(Faustine & Waty, 2022)
X1.5	Lack of experience does not always lead to delays in work.	(Messah et al., 2013)
X1.6	The workers I supervised had sufficient technical skills to complete the work independently and on time.	(Yuliana, 2009)
X1.7	The workers on this project understand the quality standards and work procedures applicable on site.	(Yuliana, 2009)
X1.8	Most of the workers I supervise are able to read blueprints and follow technical instructions well	(Pada & Construction, n.d.)
IMPACT ON WORK QUALITY		
X2.1	The work of experienced carpenters is neater , and meets specifications.	(Wijayanti et al., 2021)
X2.2	Inexperienced workers are less able to understand and address changes that occur during the work process.	(Nurtika et al., 2023)
X2.3	The work of experienced workers is less likely to result in complaints from supervisors or project owners	(Nurtika et al., 2023)

X2.4	The higher the experience of the craftsman, the better the level of precision and neatness of their work.	(Zainuri, Yanti, 2015)
X2.5	Experienced craftsmen make fewer mistakes than new craftsmen.	(Zainuri, Yanti, 2015)
X2.6	The quality of work produced by experienced workers is more consistent from one job to another	(Riza et al., 2019)
X2.7	Skilled workers with good technical understanding tend to produce high-quality work.	(Asril et al., 2024)
SAFETY AND DISCIPLINE ASPECTS		
X3.1	Experienced workers are more aware of occupational safety and health (OSH) standards	(Murtinugraha & Anisah, 2021)
X3.2	Working at heights affects worker productivity in construction projects.	(Setiawan et al., 2025)
X3.3	Experienced workers are more disciplined in terms of work time compared to inexperienced workers.	(Collins et al., 2021)
X3.4	The workers I supervised always followed safety procedures at the project site.	(K et al., 2021)
X3.5	The workers always use personal protective equipment (PPE) properly and completely while working.	(K et al., 2021)
X3.6	The workers I supervise have high discipline in terms of starting and finishing work on time.	(K et al., 2021)
X3.7	The workers demonstrate a sense of responsibility toward their own safety and that of their colleagues while working.	(Murtinugraha & Anisah, 2021)

Variable Y is classified into only one dimension, namely productivity and efficiency, with eight statement indicators as a means of determining and identifying respondents based on work productivity. Variable Y can be seen in Table 2.

Table 2. Variable Y

VARIABLE	STATEMENT	REFERENCE
PRODUCTIVITY AND EFFICIENCY		
Y1	The presence of experienced workers increases the speed of job completion	(Beatrick Wineke et al., 2018)
Y2	Experienced workers are more efficient in the use of tools and materials.	(Beatrick Wineke et al., 2018)

Y3	Inexperienced craftsmen should communicate more frequently with their coworkers and supervisors.	(Beatrick Wineke et al., 2018)
Y4	Environmental factors and adequate facilities can improve the productivity of workers and construction projects	(Beatrick Wineke et al., 2018)
Y5	A combination of experienced and inexperienced workers can increase productivity if managed properly.	(Beatrick Wineke et al., 2018)
Y6	The workers I supervised were able to complete the work according to the set deadline.	(Buya et al., 2022)
Y7	The worker can complete the daily work volume according to the established standards without compromising quality.	(Buya et al., 2022)
Y8	Workers work efficiently and rarely experience delays due to errors or rework	(Buya et al., 2022)

Validity and Reliability Testing of the Instrument

The following are the results of the validity test using Variable X, as shown in Table 3 below.

Table 3. Validity Test of Variable X

Variable	N	rTable	Calculated r	Description
X1.1	6	0.254	.285*	VALID
X1.2	60	0.254	.289*	VALID
X1.3	60	0.254	.370**	VALID
X1.4	60	0.254	.139	INVALID
X1.5	6	0.254	-.118	INVALID
X1.6	6	0.254	.467**	VALID
X1.7	60	0.254	.272*	VALID
X1.8	6	0.254	.266*	VALID
X2.1	60	0.254	.589**	VALID
X2.2	60	0.254	0.220	INVALID
X2.3	6	0.254	.354**	VALID
X2.4	60	0.254	.602**	VALID
X2.5	60	0.254	.124	INVALID
X2.6	60	0.254	.525**	VALID
X2.7	60	0.254	.521**	VALID
X3.1	60	0.254	.438**	VALID
X3.2	6	0.254	.279*	VALID
X3.3	6	0.254	.178	INVALID
X3.4	60	0.254	.392**	VALID
X3.5	60	0.254	.042	INVALID
X3.6	6	0	.378**	VALID
X3.7	60	0.254	.567**	VALID

Of the 30 indicators used to measure the Experience variable (X), the validity test results show that 6 indicators did not meet the validity criteria. This is because the *item-total* correlation values of the six indicators were below the critical threshold of 0.254. Conversely, the other indicators were deemed valid because they had correlation values above 0.254, thus meeting the requirements for further analysis. The invalidity of some indicators is common in quantitative research, often because the indicators do not adequately represent the dimension being measured or are not well understood by the respondents. Therefore, only the indicators proven to be valid will be used in the reliability test and subsequent data analysis.

Table 4. Validity Test of Variable Y

Variable	N	rTable	Calculated r	Description
Y1	60	0.254	.594**	VALID
Y2	60	0.254	.596**	VALID
Y3	60	0.254	.667**	VALID
Y4	60	0.254	.320*	VALID
Y5	60	0.254	.446**	VALID
Y6	60	0.254	.516**	VALID
Y7	60	0.254	.507**	VALID
Y8	60	0.254	.443**	VALID

The results of the validity test on the 8 indicators of the Productivity (Y) variable show that all indicators are valid. This is because the *item-total* correlation (calculated r) of each indicator exceeds the table r value of 0.254. The highest calculated r value was recorded in indicator Y3, which was 0.667, while the lowest value was in indicator Y4, which was 0.320. However, both values, as well as the other indicators, still meet the validity requirements. These results indicate that all indicators are capable of accurately measuring productivity aspects according to respondents' perceptions. Therefore, all indicators of variable Y can be used in the next analysis stage, including reliability testing and testing the relationship between variables.

Table 5. Reliability Test of Variable X
Case Processing Summary

		N	
Cases	Valid	60	100,0
	Excluded ^a	0	0
	Total	60	100

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	Number of Items
,74	16

After conducting reliability tests on the indicators of variable X (Experience) that had been declared valid, a Cronbach's Alpha value of 0.740 was obtained. This value is above the commonly used minimum limit of 0.7, indicating that the instrument for variable X has a good level of internal consistency and is reliable. Therefore, the indicators that passed the validity test for this variable are deemed reliable and suitable for further analysis.

Table 6. Reliability Test of Variable Y
Case Processing Summary

		N	%
Cases	Valid	60	100,
	Excluded ^a	0	0
	Total	60	100

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	Number of Items
,725	8

The reliability test results for the Productivity (Y) variable show a Cronbach's Alpha value of 0.725. This figure exceeds the threshold of 0.7, indicating that the measurement instrument for variable Y has adequate reliability and is capable of consistently measuring productivity. Therefore, all indicators of variable Y are deemed reliable and ready for use in the next stage of analysis.

Classical Assumption Test

This analysis began with a series of classical assumption tests to ensure the validity of the statistical model. First, the Normality Test using the One-Sample Kolmogorov-Smirnov method was applied to verify that the data was normally distributed, with a significance value (α) ≥ 0.05 . Next, the Linearity Test was conducted to confirm the existence of a linear relationship between variables. The Multicollinearity Test was then performed to ensure that there was no excessive correlation between independent variables, which could disrupt the stability of the model estimation. Finally, the Correlation Test was conducted to identify the existence, strength, and direction of the relationship between variables, such as between the experience of craftsmen and project productivity.

Table 7. Normality Test

		Unstandardized Residual
N		6
Normal	Mean	,000000
Parameters ^{a,b}	Std. Deviation	4.82042644
Most Extreme	Absolute	,110
Differences	Positive	,083
	Negative	-,110
Test Statistic		,110
Asymp. Sig. (2-tailed)		.067 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors significance correction.

The results of the normality test using the Kolmogorov-Smirnov/Shapiro-Wilk method showed a significance value of 0.067. Since this value is greater than the significance limit of 0.05, it can be concluded that the data in this study are normally distributed. Therefore, the normality assumption is fulfilled, allowing the use of parametric statistical analysis to test the relationship between variables.

Table 8. Linearity Test
ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Productivity * Experience	Between Groups	(Combined)	1559	2	59,967	2,454	0.008
		Linearity	956,354	1	956,354	39,132,000	
		Deviation from Linearity	602,796	25	24,112	,987	,507
	Within Groups		806,500	33	24,439		
	Total		2,365,650	59			

Based on the results of the linearity ANOVA test, a significance value of 0.507 was obtained, which exceeds the threshold of 0.05. Additionally, the calculated F value of 0.987 is also smaller than the table F value of 1.901. This finding indicates that the relationship between variables X and Y is linear, thus meeting the linearity assumption required for further statistical analysis, such as correlation or regression.

The homoscedasticity test was conducted and showed randomly distributed residuals around zero with a significance value greater than 0.05, indicating that the assumption is met.

Table 9. Multicollinearity Test
Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Skills and Knowledge of Craftsmen	0.83	1.205
	Impact on Work Quality	0.768	1.302
	Safety and Discipline Aspects	0.892	1

a. Dependent Variable: Productivity and Efficiency

Based on the results of the multicollinearity test in multiple regression, the Tolerance values for the three independent variables (Skills and Knowledge of Craftsmen, Impact on Work Quality, Safety and Discipline Aspects) are above 0.1, namely 0.830; 0.768; and 0.892. Meanwhile, the VIF values are also very low, at 1.205; 1.302; and 1.120, all of which are well below the critical threshold of 10.

This indicates that there is no multicollinearity problem between the independent variables in the multiple regression model. Thus, these variables can be used simultaneously in regression analysis without affecting the accuracy of the coefficient estimates.

Table 10. Autocorrelation Test

Model Summary^b

Model	Durbin-Watson
1	2.243 ^a

a. Predictors: (Constant), Safety and Discipline Aspects, Skills and Knowledge of Workers, Impact on Quality Work

b. Dependent Variable: Productivity and Efficiency

The Durbin-Watson (DW) value of 2.243 falls within the range of between du (1.6889) and $4 - du$ (2.3111), thus meeting the criteria of $du < DW < 4 - du$. This indicates that there is no autocorrelation problem in the multiple

regression model used, meaning that the model residuals are not serially correlated.

In other words, the assumption of error independence is met, so the regression results can be considered valid and reliable for further analysis.

Analysis of the Relationship between Variables

Correlation and Regression of Main Variables (Total Experience and Productivity)

Table 11. Simple Linear Regression Test of Main Variables
Measures of Association

	R	R Squared	Eta	Eta Squared
Productivity	0.636	0.404	0.812	0.659
*				
Experience				

Based on the analysis results, the coefficient of determination (R Square) value obtained was 0.404, indicating that experience has an influence on productivity of 40.4%. This means that approximately 40% of the variation in labor productivity can be explained by work experience. The remaining 59.6% is influenced by other factors outside the experience variable that were not examined in this study. The results of the coefficient of determination circle diagram can be seen in Figure 2 below.

Experience Dimension (X)	Correlation Coefficient (r)	Strength of Relationship	Direction of Relationship	Description
Skills & Knowledge	.358**	Weak	Positive	There is a weak and direct linear relationship between skills & knowledge and productivity
Job Quality	.557**	Moderate	Positive	A fairly strong linear relationship; the higher the job quality, the higher the productivity
Safety and Discipline	.471**	Moderate	Positive	A fairly strong linear relationship; discipline and work safety also driving productivity



Figure 5. Circle Diagram of the Determination Coefficient

Correlation and Regression by Dimension of Variable X with Productivity

Table 12. Correlation and Regression by Dimension of Variable X on Productivity

Experience Dimension (X)	Correlation Coefficient (r)	Strength of Relationship	Direction of Relationship	Description
Skills & Knowledge	.358**	Weak	Positive	There is a weak and direct linear relationship between skills & knowledge and productivity
Job Quality	.557**	Moderate	Positive	A fairly strong linear relationship; the higher the job quality, the higher the productivity
Safety and Discipline	.471**	Moderate	Positive	A fairly strong linear relationship; discipline and work safety also driving productivity

The results of the Correlation and Regression Tests by Dimension show correlation values in the Skills & Knowledge aspect of 358**, Work Quality of 557**, and Safety and Discipline of 471**. Of the three aspects, Experience significantly influences Job Quality, proving that Variable X with Productivity shows a positive relationship. This indicates a positive relationship between the aspects of Skills & Knowledge, Job Quality, Safety and Discipline with Productivity, which influences the efficiency of construction projects. In other words, each aspect is correlated with increased productivity and efficiency in the project.

Correlation Between Dimensions of Variable X

Table 13. Correlation Between Dimensions of Variable X

No	Comparison Variable	Value Correlation (r)	Strength of Relationship	Direction of Relationship	Description
1	X1 - X2	.409**	Moderate	Positive	The higher the skills & knowledge (X1), the better the quality of work (X2). This indicates that adequate skills contribute to better work outcomes.
2	X1 - X3	,	Very Weak	Positive	There is a very weak relationship between skills (X1) and discipline (X3). This means that an increase in skills does not always go hand in hand with an increase in safety and work discipline. Other factors may be more dominant.
3	X2 - X3	.324	Weak	Positive	Improvements in work quality (X2) tend to be followed by improvements in safety and discipline (X3), although the relationship is not very strong. This may indicate that high-quality work is generally carried out in a more orderly and safe.

The results of the correlation test between the dimensions of Variable X show a positive relationship. This indicates a positive relationship between the aspects of Variable X itself. It can be concluded that experience influences the efficiency of construction projects. In other words, each aspect is correlated and will affect productivity and efficiency in projects.

Key Findings of the Study

This study consistently shows that experience has a significant influence on the productivity of construction projects in Cirebon. This is evidenced by the R-squared value of 0.404 from the linearity test, indicating that experience contributes 40.4% to the productivity of construction workers. This is further supported by the findings of the Regression and Correlation tests, where each dimension shows a value of 0.358 with a significance level of 0.005 ($p < 0.01$) for Skills and Knowledge, In the Quality of Work dimension, Pearson's correlation analysis shows a correlation coefficient of 0.557 with a significance level of 0.000 ($p < 0.01$), and in the Safety and Discipline aspect, Pearson's correlation test shows a correlation coefficient of 0.471 with a significance level of 0.000 ($p < 0.01$). Overall, these

findings indicate a positive and significant relationship between each dimension of experience (variable X) and the productivity and efficiency of construction projects (variable Y). This confirms that the experience of construction workers, as reflected in their skills, work quality, and adherence to safety and discipline, is a key factor in improving project performance.

CONCLUSION AND RECOMMENDATION

Based on the results of the research and analysis conducted, it can be concluded that experience significantly affects the productivity of construction projects in the Cirebon area, contributing 40.4% to the productivity of craftsmen. All three aspects of experience show a positive relationship, where the quality of work is greatly influenced by experience, with correlation and regression test results showing a correlation value of 0.557. This means that an increase in the quality of workers' work will be directly proportional to an increase in project productivity and efficiency. Furthermore, the dimensions of the Impact of Work Quality and the Safety and Discipline Aspects of the experience factor are the main drivers of productivity, as evidenced by the average respondent rating of 3.8 and the correlation significance value of 0.000 ($p < 0.01$).

ADVANCED RESEARCH

Although this study successfully demonstrated a significant influence of craftsmen's experience on project productivity in Cirebon, amounting to 40.4%, it is important to acknowledge that there are several limitations that require further exploration. The main limitations lie in the perception-based measurement method, which is potentially subjective, and the limited geographical scope. Furthermore, this study did not in ly examine other factors such as project management, material conditions, and technology use, which also play a crucial role in determining productivity. Therefore, further research is needed to fill these gaps and provide a more comprehensive understanding of the factors driving productivity in the construction industry.

Given the significant impact of workers' experience on project productivity in Cirebon (40.4%), particularly through work quality, safety, and discipline, further research should focus on:

- a. Analysis of Moderating and Mediating Variables: Examining how external factors (e.g., project complexity, technology) influence the relationship between experience and productivity, and whether problem-solving skills or operational efficiency act as mediators of the impact of experience.
- b. Quantifying Productivity Differences: Measuring productivity differences and rework rates between novice, intermediate, and expert craftsmen on specific tasks for more detailed empirical data.
- c. Development of Training Models and Policies: Identifying key competencies from experience through in-depth interviews, which can then serve as the basis for developing training programs or mentoring

initiatives and policy recommendations to enhance craftsmen productivity in Cirebon.

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