

THE INFLUENCE OF LEADERSHIP AND WORK ENVIRONMENT ON EMPLOYEE PRODUCTIVITY THROUGH COMMUNICATION AS A MEANS INTERVENING VARIABLES IN EXTENSION CENTER AGRICULTURE IN BIREUEN DISTRICT

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Abstract

This study aims to determine the influence of leadership and work environment on employee productivity through communication as an intervening variable at the Agricultural Extension Center in Bireuen Regency. The independent variables in this study are leadership and work environment, the dependent variable is employee productivity, and the intervening variable is communication. This study uses a quantitative method, collecting data using a questionnaire containing questions and statements distributed to all employees at the Agricultural Extension Center. The scoring technique uses a Likert scale. This study was conducted at the Agricultural Extension Center in Gandapura, Kuta Blang, and Peusangan Districts with a total of 108 respondents. The sampling method used in this study was saturated sampling, where the entire population was sampled, resulting in a total sample of 108 respondents. This study used multiple linear regression analysis with SPSS (Statistical Program for Social Science). The results of the study indicate that leadership and the work environment have a positive and significant influence on communication and directly impact employee productivity. Furthermore, communication has been shown to significantly mediate the influence of leadership and the work environment on productivity. These findings indicate that improving leadership quality and a conducive work environment, coupled with effective communication, can optimally boost employee productivity. This research is expected to serve as a reference for managers of the Agricultural Implementation Center in formulating strategies to improve employee performance.

Keywords: Leadership, Work Environment, Communication, Employee Productivity

INTRODUCTION

Human resources are an inseparable component of any organization, whether an institution or a company. Consequently, people, as a vital asset for a company, must be properly cared for and managed. This is done to ensure that the organization's human resources can perform optimally to achieve organizational goals and increase employee productivity. Human resource management requires management capable of managing human resources effectively, in a planned, and systematic manner (Solehati et al., 2024). In this regard, the role of superior and high-quality human resources (Desi & Pangastuti, 2019) is crucial. Quality human resources are a crucial component of business, providing a source of competitive advantage and enhancing organizational competitiveness (Fernandes & Taba, 2019). Human resource management requires mechanisms that shape the values and norms of an individual or group and equip them with activities that support performance, thus requiring comprehensive management.

Organizations need to manage, improve, and utilize these human resources to ensure they are dedicated and highly motivated (Bhatti et al., 2016), innovative, and skilled in delivering excellent performance (Tupty et al., 2021). Employee productivity is crucial to an organization's success. High levels of productivity not only improve operational efficiency but also significantly contribute to the achievement of overall organizational goals. Productive employees tend to have high levels of motivation, feel engaged in the work process, and are able to make maximum contributions to achieving desired results. Productivity is the ability of an individual, system, or company to use resources efficiently and productively to achieve desired results. Therefore, every organization wants its employees to be more productive. Employees who possess strong work motivation and are able to complete their work in a

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timely manner are categorized as productive individuals (Solehati et al., 2024). Organizations desperately need high employee productivity, as it effectively achieves organizational goals. High work productivity impacts a company's performance, positively impacting its performance by increasing public and government trust (Indriani et al., 2024). According to Edy Sutrisno (2017), leadership is a process in which a person directs, guides, and influences others to be able to carry out tasks to achieve certain goals. Meanwhile, according to Kartono in Kumala and Agustina (2018, 101), leadership style reflects behavioral patterns and strategies resulting from a combination of skills, traits, and attitudes used by leaders in influencing the performance of their subordinates. According to Farida and Hartono (2016), leadership style can be interpreted as the behavior or approach chosen by a leader to influence the way of thinking, feeling, and actions of organizational members or subordinates. In this study, leadership was measured using several indicators to ensure objective and targeted assessment. Leadership indicators include the ability to set an appropriate example, provide on-the-job coaching, determine organizational direction, provide a clear assessment system, and pay attention to work facilities and infrastructure (Suhada, 2018). Measuring these indicators is expected to demonstrate the effectiveness of leadership within the organization.

In practice, leadership often faces various challenges. For example, difficulties in implementing policies consistently, a lack of training to develop leadership skills, and differences in perceptions between management and employees regarding expectations and hopes. All of these can impact leadership effectiveness and ultimately impact the organization's overall productivity. The phenomenon of leadership in the Agricultural Extension Center can be seen from various indicators, namely vision and goals, decision-making skills, communication skills, transformational leadership, motivational skills, team-building skills, and integrity and ethics. In Gandapura District, although the leader's vision and goals are clear, there are problems in the ability to make quick and accurate decisions, and communication is not optimal. Transformational leadership is seen from the change initiatives undertaken, but the ability to motivate employees still needs to be improved, especially in building a solid team. The integrity and ethics of the leader here are well maintained.

Kutablang District faces significant challenges across all indicators, with unclear vision and goals, weak decision-making skills, and ineffective communication. Transformational leadership is almost non-existent, resulting in low employee motivation and difficult team building. Integrity and ethics issues also require serious attention. Meanwhile, in Peusangan District, the leadership's vision and goals are quite clear with better decisions than Kuta Blang, but communication still needs improvement. There are efforts at transformational leadership, but they are not yet optimal in motivating employees and building a strong team. The integrity and ethics of leaders here are quite well maintained. Abdul Jalil (2022) found that leadership had a positive and significant impact, meaning that the higher the leadership style, the higher the employee productivity at the Ilir Barat II Palembang Sub-district Office. Research by Ma'rif and Kusumaningtyas (2024), Nur Hilal et al., and Haerudin et al. (2021) confirmed that democratic leadership and leadership communication had a positive and significant impact on employee productivity in regional secretariats and private companies. These findings indicate that appropriate leadership can provide direction, motivation, and effective communication, thus supporting increased productivity. In addition to leadership, the work environment is also an essential prospect that influences the productivity and productivity of company employees.

A conducive work environment within a company must be created and equipped as well as possible, as it is the direct means by which employees work and engage. Without a conducive work environment, an unfavorable and disharmonious situation will emerge, which can negatively impact workforce productivity. Companies with a positive and safe work environment facilitate increased employee productivity. A positive work environment can also help reduce boredom and fatigue, which in turn boosts employee productivity. In this study, the work environment was measured using several indicators, including workplace lighting conditions, air quality, workplace safety, noise levels, and employee relationships. These indicators were adapted from research by Itsnaini, Maulidia, & Nurhayaty (2023) and used to assess the extent to which the work environment supports comfort, safety, and social relationships among employees. Measurements were conducted using a Likert scale to describe employees' perceptions of their work environment.

The work environment at the Agricultural Extension Center can be seen in indicators such as comfort working from home, good relationships between employees, and performance rewards. In Gandapura District, although some employees feel comfortable working from home, there are challenges in maintaining good relationships due to the lack of direct interaction. The organization here tends to reward performance through incentives and recognition. In Kuta Blang District, the comfort of working from home is less felt due to limited facilities and technological support; relationships between employees are often less harmonious due to ineffective communication; and performance recognition remains minimal, reducing employee motivation.

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Meanwhile, in Peusangan District, working from home has improved with adequate technological support. Good relationships between employees are maintained through regular communication, and the organization has begun to reward performance, although improvements are still needed. Furthermore, communication is also a key determinant of employee productivity. Research by Ma,ruf and Kusumaningtyas (2024) and Syafrizal (2022) demonstrates that a conducive and supportive work environment can increase employee productivity. Similar findings were also reported by Irfan (2022) and Alqawi et al. (2024), who confirmed that the work environment has a positive and significant effect on employee motivation and productivity, even with the support of motivation as a mediating variable. International research by Hilal et al. (2023) and Haerudin et al. (2021) also strengthens the evidence that a conducive work environment directly contributes to employee performance across various organizational contexts.

Research has shown that a good work environment will increase employee productivity. This is because a good work environment will stimulate employee productivity through environmental conditions such as a clean workplace, appropriate air temperature, good lighting, and avoiding noise that disrupts work concentration. Basri, (2024). Similarly, research conducted by Madina et al., (2024) shows that the work environment has a significant impact on work productivity. According to Deddy Mulyana (2024), communication is a process of conveying messages in various forms, both verbal and nonverbal, involving the exchange of information, opinions, ideas, and/or feelings between two or more parties. Effective communication is a crucial factor in determining employee work productivity. Good leadership can provide clear direction and motivate employees, while a conducive work environment can create an atmosphere that supports collaboration and efficiency. However, without effective communication, the direction from the leader and the benefits of a good work environment cannot be optimally implemented. Clear and open communication ensures that employees understand their duties and responsibilities, can share ideas, resolve conflicts, and work together better, thereby increasing overall work productivity.

In this study, communication was measured using several indicators designed to illustrate the extent to which information exchange occurs effectively in the workplace. These indicators include trust in extension workers, their ability to convey information, their expertise, their attractiveness in communicating, and the closeness between extension workers and employees. These indicators were adapted from Triyono & Ekoyudistiro (2017) and measured using a Likert scale to assess employee perceptions of the quality of communication at the Agricultural Extension Center. The communication phenomenon at the Agricultural Extension Center can be seen from indicators of message comprehension, ability to provide input, speed of information reception, task coordination, and effectiveness of discussion meetings. In Gandapura District, although messages are generally understandable, there are difficulties in providing input due to a rigid hierarchy; information tends to be received quickly, but task coordination is still often hampered by a lack of communication between divisions; discussion meetings are quite effective but need to increase participation. In Kuta Blang District, message understanding is often problematic due to a lack of clarity in information delivery; employees are reluctant to provide input due to a lack of openness; information is often received late, resulting in ineffective task coordination; and discussion meetings are held infrequently and are less productive.

Meanwhile, in Peusangan District, message comprehension was better with efforts to make information clear and easy to understand; employees were more open in expressing input, although not optimally; information was received fairly quickly, and task coordination was relatively good with a more structured communication system; discussion meetings took place regularly and were quite effective. Based on the explanation above, it shows that several studies still show varying results, especially regarding the significance of the influence of leadership in certain work environments, as well as the need to delve deeper into how communication plays a role as an intervening or supporting variable in strengthening the relationship between leadership and the work environment with employee productivity. Therefore, further research is needed that specifically examines the relationship between these three variables simultaneously, by highlighting the role of communication as a connecting mechanism that can clarify the flow of influence of leadership and the work environment on productivity. This is an important research gap to be uncovered, especially in the context of the Agricultural Extension Center, which has the characteristics of a public service organization with different communication and coordination challenges than the industrial sector in general.

LITERATURE REVIEW

Abdul Jalil (2022) conducted a study entitled "The Influence of Leadership Style on Employee Productivity at the Ilir Barat II Palembang Sub-district Office." This study aimed to determine the influence of leadership on employee productivity. The results showed that leadership style had a positive and significant effect on productivity, meaning that the higher the leadership style, the higher the employee productivity. Research by Ma'ruf, MF, and Kusumaningtyas, M. (2024) entitled "The Influence of Work Environment and Leadership Style on Employee Work Productivity at PT Univenus" aims to analyze the influence of work environment and leadership on work productivity.

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The results show that a conducive work environment and strong leadership overall increase employee productivity at the company. A study by Suwanto *et al.* (2023) entitled "The Influence of Interpersonal Communication and Motivation on Work Productivity of Employees at the Kolaka Regency Tourism Office" aims to analyze the influence of communication and motivation on work productivity. The results show that using the SEM-PLS model, this study found that interpersonal communication and work motivation both have a positive and significant effect on employee productivity in Kolaka regional government agencies. Syafrizal's (2022) study, "The Influence of Leadership and Work Environment on Work Productivity in the Logistics Department of PT Sukanda Djaya Medan," aimed to determine the influence of leadership and work environment on work productivity. The results showed that the leadership variable had a partial positive but insignificant effect on work productivity, while the work environment variable had a positive and significant effect on work productivity.

Research by Irfan (2022) examines "The Effect of Work Discipline and Work Environment on Employee Work Productivity with Motivation as an Intervening Variable." The purpose of this study was to determine the effect of work discipline and work environment on work productivity mediated by motivation. The results showed that work discipline and work environment have a positive and significant effect on motivation, and motivation has a positive and significant effect on employee work productivity. Work discipline and work environment also have a positive and significant effect on work productivity through motivation as an intervening variable. A recent study by Alqawi *et al.* (2024) entitled "Determination of Work Productivity Through Motivation: Analysis of the Work Environment, Discipline, Occupational Safety and Health (K3) on Healthcare Workers at Satria Medika Hospital, Bekasi" aims to determine the influence of the work environment, discipline, and occupational safety and health (K3) on productivity mediated by motivation. The results of the study indicate that the work environment, discipline, and K3 have a positive and significant effect on motivation. The work environment and K3 also have a significant effect on productivity, while discipline does not have a significant direct effect, but has a significant indirect effect through motivation.

Research by Zulkifli Sultan (2024), entitled "The Role of Effective Communication in Harmonizing Work Relations and Increasing Employee Work Productivity," aimed to determine the effect of work productivity on employee productivity. The results of this study indicate that effective communication has a significant impact on creating harmonious work relationships and increasing work productivity. A study by Aysha Sadia *et al.* (2023) titled "The Relationship between Organizational Communication and Employee Productivity with New Dimensions of Effective Communication Flow" was conducted. This study aimed to determine the effect of communication on work productivity. The results of this study showed that organizational communication significantly influences employee productivity. Nur Hilal *et al.* (2023) conducted a study entitled "The Impact of Democratic Leadership and Work Environment on Employee Productivity in the Regional Secretariat." This study aimed to determine the influence of leadership on the work environment. The results showed that democratic leadership and the work environment had a positive and significant impact on productivity. Ritonga and Jingga (2024) conducted a study entitled "The Influence of Work Communication on Work Productivity at PT. Pelabuhan Indonesia." This study aimed to determine the effect of communication on work productivity. The results of this study indicate that communication influences work productivity.

Research by Haerudin *et al.* (2021) entitled "The Influence of Work Environment and Leadership on Work Productivity Through Employee Job Satisfaction at the Pangkep Regency Regional Secretariat". This study aims to determine the influence of the work environment and leadership on work productivity. The results of this study indicate that there is a positive and significant direct influence of the work environment and leadership on employee job satisfaction at the Pangkep Regency Regional Secretariat, there is a positive and significant direct influence of the work environment and leadership on employee work productivity at the Pangkep Regency Regional Secretariat. Research by Massora (2022) entitled "The Influence of the Work Environment and Communication on the Work Productivity of Ministry of Tourism Employees." This study aimed to determine the influence of the work environment and communication on productivity. The results showed that the work environment and communication simultaneously had a positive and significant impact on work productivity. Meanwhile, the partial effect showed that communication had a positive and significant impact on employee work productivity. A study by Massoudi & Hamdi (2017) entitled "The Consequence of Work Environment on Employee Productivity" aims to determine the influence of the work environment on work productivity. The results of this study indicate a relationship between the work environment and employee productivity. The behavioral component of the employee environment has a greater influence on productivity. This means that the work environment has a positive and significant impact on productivity.

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Research by Susan Febriana *et al.* (2025) entitled "Exploring the Relationship Between Leadership Communication Style, Personality Trait, and Organizational Productivity" aims to determine the influence of leadership and communication on productivity. The results of this study indicate that effective communication skills are the foundation of a leader's success. Leaders who are able to convey information in a timely and open manner will be more successful in building team trust and collaboration. Research by Muhammad Abdul Rosid (2024) with a study entitled "The Influence of Communication and Work Environment on Employee Work Productivity at PT. Dynamics of Indonusa Prima Tangerang City". This study aims to determine the influence of communication and work environment on productivity. The results of this study indicate that communication and work environment simultaneously have a significant positive effect on employee productivity. This finding confirms that communication is more influential than the work environment partially, but both are important in the simultaneous model.

Research by Harris Kristanto and Yusuf Ronny Edward (2020) with a study entitled "The Effect of Leadership Style and Communication on Employee Performance Through Job Satisfaction as a Mediation Variable at PT. Trans Sumatra Agung in Medan". This study aims to determine the effect of communication and leadership on work productivity. The results of the study indicate that leadership positively influences a symmetrical internal communication system. Communication functions as a mediator between leadership and organizational advocacy behavior. This means that leadership works through communication to influence productivity and positive relationships with the organization. The results of the study indicate that leadership positively influences a symmetrical internal communication system. Communication functions as a mediator between leadership and organizational advocacy behavior. This means that leadership works through communication to influence productivity and positive relationships with the organization. A study by Win Naing Soe and Amiya Bhaumik (2024) entitled "The Mediating Role of Employee Behavioral Attitude Between Office Environment and Employee Performance" was conducted to determine the influence of the work environment as mediated by communication. The results indicate that the work environment has a strong direct influence on employee performance, as well as an indirect influence through communication and interaction. This means that communication is a significant mediating variable.

METHOD

The objects of research were employees at the Agricultural Extension Center in Gandapura District, Kuta Blang District and Peusangan District. The research will be conducted at the Agricultural Extension Centers in Gandapura, Kuta Blang, and Peusangan Districts. Gandapura, Kuta Blang, and Peusangan Districts, Bireuen Regency, face unique challenges related to employee productivity. Each district has distinct agricultural characteristics and challenges, which can provide a comprehensive overview of agricultural extension employee productivity. Gandapura District has distinct primary commodities and agricultural techniques from Kuta Blang and Peusangan. The population in this study was all employees at the Agricultural Extension Center in Gandapura District, Kuta Blang District, and Peusangan District, totaling 108 people. The sampling technique used was a census where the sample was determined as a whole. The number of populations taken was 108 employees at the Agricultural Extension Center in Gandapura District, Kuta Blang District, and Peusangan District. This research uses a quantified qualitative approach. The data collection technique used in this study was a questionnaire. A questionnaire is a data collection technique that involves distributing a list of questions or statements to respondents to obtain the necessary information.

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RESULTS AND DISCUSSION

Validity Test Results

Table 1
Validity Test Results

No	Indicator	Mark rhitung	Mark r table	Note
1	Leadership(X1)			
	1. Statement 1	0.687	0.189	Valid
	2. Statement 2	0.463	0.189	Valid
	3. Statement 3	0.709	0.189	Valid
	4. Statement 4	0.642	0.189	Valid
	5. Statement 5	0.456	0.189	Valid
2	Work environment(X2)			
	1. Statement 1	0.580	0.189	Valid
	2. Statement 2	0.432	0.189	Valid
	3. Statement 3	0.480	0.189	Valid
	4. Statement 4	0.456	0.189	Valid
	5. Statement 5	0.576	0.189	Valid
3	Communication(Z)			
	1. Statement 1	0.761	0.189	Valid
	2. Statement 2	0.413	0.189	Valid
	3. Statement 3	0.249	0.189	Valid
	4. Statement 4	0.584	0.189	Valid
	5. Statement 5	0.637	0.189	Valid
4	Employee Productivity(Y)			
	1. Statement 1	0.609	0.189	Valid
	2. Statement 2	0.572	0.189	Valid
	3. Statement 3	0.625	0.189	Valid
	4. Statement 4	0.228	0.189	Valid
	5. Statement 5	0.318	0.189	Valid

Source: Research Results, Data processed 2025

The table above shows the obtained values of all statements of indicators of leadership variables, work environment, communication and employee productivity (Y). To measure the variables in this study, each has a large person correlation from the rtable value for (df) = n - 2 = 108 - 2 = 106, then the rtable value is 0.200. Based on the results in the table, it can be concluded that all statement indicators in this study are declared valid.

Reliability Test Results

Table 2
Reliability Test Results

Variables	Cornbach's Alpha	Information
Leadership(X1)	0.726	Reliable
Work environment(X2)	0.662	Reliable
Communication(Z)	0.699	Reliable
Work Productivity (Y)	0.647	Reliable

Source: Research Results, Data processed 2024

From the table above it can be seen that the value *Cornbach's Alpha* from variables leadership(X1) of 0.726, the *Cornbach's Alpha* value of the variable work environment (X2) of 0.662, the *Cornbach's Alpha* value of the variable communication(Z) of 0.699, and the *Cornbach's Alpha* value of the work productivity variable (Y) is 0.647.

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These results indicate that the Cornbach's Alpha results of each variable are > 0.60 , so all variables can be declared reliable.

Data Normality Test Results

According to Ghozali (2018), the normality probability plot graph states that if the data spreads around the diagonal line and follows the direction of the diagonal line, then the regression model meets the normality assumption. Based on the SPSS output results showing that the data spreads around the diagonal line, it can be concluded that the data in this research regression model is normally distributed.

Multicollinearity Test Results

From the table above it can be seen that the variables leadership with the total tolerance value (0.784) and VIF value (1.276). Variable work environment with the total tolerance value (0.782) and VIF value (1.278). Communication variable with a total tolerance value of 0.779 and a VIF value of 1.283. From the table above, it can be concluded that all variables have a VIF value of ≤ 10 . and a tolerance value of ≥ 0.1 . This indicates that there is no multicollinearity and this test can be used in this research model.

Heteroscedasticity Test

From the image above, it can be concluded that the data used in this study does not exhibit heteroscedasticity. This is evident because the points in the image are spread above and below the number 0 on the Y-axis and do not form a specific pattern.

Test of the Coefficient of Determination (R²) of Model I

Table 3
Results of Correlation and Determination Coefficient Tests

Model Summary				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.620a	.385	.367	.29433

b. Dependent Variable: Employee Productivity

Source: Research Results, Data processed 2025

The table above shows a correlation coefficient (R) of 0.620, indicating no correlation between leadership, work environment, and communication variables and employee productivity. Meanwhile, the determination coefficient (R Square) is 0.385, meaning that leadership, work environment, and communication variables can explain 38.5% of employee productivity. The remaining 61.5% is influenced by factors outside of this study.

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Table 4
Regression Analysis Results

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
	1 (Constant)	1,660	.320				5,196	.000		
Leadership	.246	.065	.328	3,781	.000	.512	.348	.291	.784	1,276
Work environment	.194	.078	.216	2,484	.015	.444	.237	.191	.782	1,278
Communication	.169	.057	.257	2,956	.004	.470	.278	.227	.779	1,283

a. Dependent Variable: Employee Productivity

Source: Research Results, Data processed 2025

Based on the output in the table above, it can be seen that the value is obtained from the multiple linear regression analysis equation below:

$$PK = \beta_0 + \beta_1 KP + \beta_2 LK + \beta_3 KM$$

$$PK = 1,660 + 0.246 (KP) + 0.194 (LK) + 0.169 (KM)$$

1. The constant is 1,660, meaning that if leadership, work environment and communication are constant, employee productivity has a fixed value of 1,660.
2. The regression coefficient of the leadership variable has a positive value of 0.246, indicating a positive relationship, which means that every change in leadership causes employee productivity to increase in line with the increase in leadership.
3. The regression coefficient of the work environment variable has a positive value of 0.194, indicating a positive relationship, which means that every change in the work environment causes employee productivity to increase in line with the improvement in the work environment.
4. The regression coefficient of the communication variable has a positive value of 0.169, indicating a positive relationship, which means that every change in communication causes employee productivity to increase in line with the increase in communication.

Path Analysis Test of Leadership Variables

The indirect effect of X1 on Y through M is calculated by flowing the path of X1 to M (a) with the path of M to Y or (b) or ab. So the coefficient ab (c-c') where c is the effect of X1 on Y without controlling M. While c' is the effect of X1 on Y every time M is controlled.

To see the direct effect, it can be formulated as follows:

1. The influence of leadership on communication
 $X1 \rightarrow M = 0.280$
2. The influence of leadership on employee productivity
 $X1 \rightarrow Y = 0.328$
3. The Influence of Communication on Employee Productivity
 $M \rightarrow Y = 0.257$

To calculate the indirect effect of variable X1 on Y through intervening M, the formula can be as follows:

$$1. X1 \rightarrow M \rightarrow Y = (0.280 \times 0.257) = 0.072$$

Furthermore, to see the total effect, it can be formulated as follows:

1. The influence of leadership on employee productivity through communication
 $X1 \rightarrow M \rightarrow Y = (0.280 + 0.257) = 0.567$
2. The influence of leadership on employee productivity
 $X1 \rightarrow Y = 0.328$

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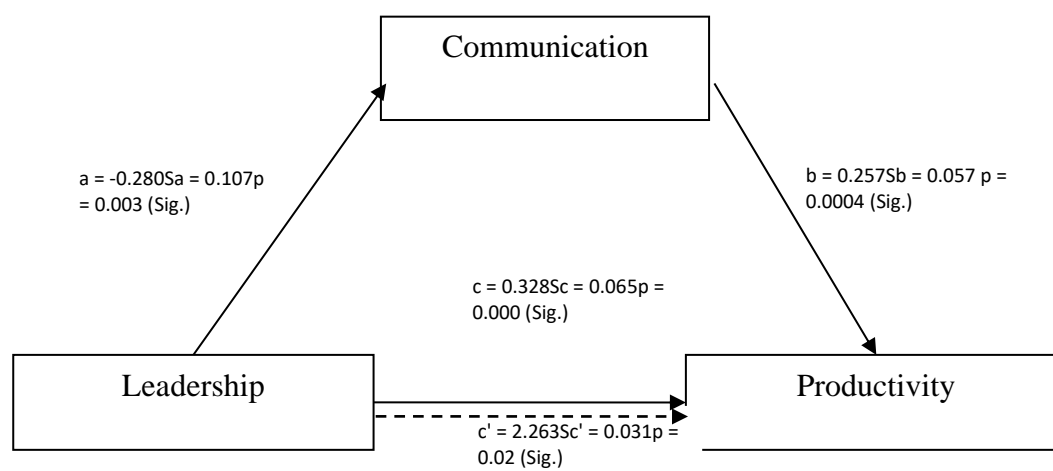
3. The influence of communication on employee productivity

$$M \rightarrow Y = 257$$

The results of the indirect effect calculations carried out in this study through regression obtained a value of 0.051.

Mediation Effect Test (Sobel Test) Model I

The calculation results obtained from the Sobel test where the statistical test value obtained was $2.263 < 2.00$, the p-value was $0.02 < 0.05$ and the standard error value was 0.031. Based on the calculation results of the probability value for path c' using the Sobel test as in Figure 4.9, the significance value for all paths (a, b, c and c') can be seen in the following Figure:



The output result of equation II shows that the influence of leadership on communication is 0.280 and is significant at 0.003, which means that leadership is able to influence communication. In the SPSS output of regression equation I, the influence of leadership on employee productivity is 0.328 with a significance of 0.000, which means that leadership is able to influence employee productivity, the influence of communication on employee productivity is 0.257 with a significance of 0.0004, which means that communication is able to influence employee productivity.

The Influence of Leadership (X1) on Employee Productivity (Y)

Based on the research results, leadership has a significant effect on employee productivity. This is evident from the calculated t-value of $3.925 > t\text{-table } 1.659$, with a significance value of $0.000 < 0.05$. These results indicate that the better the leadership implemented, the higher the employee productivity. The leadership referred to in this study includes the superior's ability to provide positive examples, provide direct coaching in the field, provide a clear and fair assessment system, and determine the direction and goals of the organization well. Based on the results of the questionnaire and field observations, many employees gave a positive perception of leaders who were directly involved in the extension process and administrative activities. Extension workers felt more motivated to complete tasks on time and with better quality when they saw the example and concern of their leaders. Supportive and open leadership not only builds trust but also increases the work motivation of extension workers. This confirms that strong leadership is not merely symbolic, but is able to motivate individuals within the organization to achieve optimal performance. These results support the findings of Abdul Jalil (2022), Ma'ruf, MF and Kusumaningtyas, M. (2024), Nur Hilal et al. (2023), Syafrizal (2022) and Haerudin et al (2021) which state that leadership style has a positive effect on employee productivity.

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The Influence of Work Environment (X2) on Employee Productivity

The results of the study show that the work environment has a calculated t value of 3.004 which is greater than the t table of 1.659, with a significance value of $0.003 < 0.05$, so it can be concluded that the work environment has a significant effect on employee productivity at the Bireuen Regency Agricultural Extension Center. The work environment referred to in this study includes physical aspects such as the availability of work facilities and infrastructure, adequate work space, and a conducive and stress-free work atmosphere. Based on respondents' answers, most employees stated that a comfortable work environment makes it easier for them to carry out their tasks, both administration and direct extension activities in the field. Facilities such as operational vehicles, presentation tools, and representative work space are considered to affect the quality of their work. Mutually supportive interpersonal relationships between employees are also a strong indicator that a healthy work environment can strengthen work ethic. A positive work environment makes employees feel valued and cared for, thus being more enthusiastic about completing their work efficiently and productively. These results are consistent with research by Ma'ruf, MF and Kusumaningtyas, M. (2024), Syafrizal (2022), and Irfan (2022), Alqawi et al. (2024), Nur Hilal et al. (2023), Haerudin et al. (2021), Massoa (2024), and Massauodi and Hamdi (2017), which states that a comfortable and supportive work environment can significantly increase productivity.

The Influence of Leadership (X1) on Communication (M)

The analysis results show a t-value of $4.964 > t\text{-table } 1.659$, with a significance level of 0.000, indicating that leadership significantly impacts communication. This demonstrates that the leadership style employed by leaders at BPP Bireuen significantly impacts the quality of communication within the organization. Leaders who are open to input, able to provide clear instructions, and facilitate informal and formal discussions foster effective communication. Many employees expressed that they felt more comfortable expressing ideas and complaints when their leaders had a non-authoritarian communication style. This fostered a culture of mutual respect and supported efficient coordination in task execution. Leaders who are able to convey direction effectively also prevent organizations from technical errors and role conflict. This finding aligns with research by Susan Febrianti (2025), which emphasizes the importance of communication skills in leadership to maintain team stability and productivity. Without clear communication, coordination within an organization's control system fails, directly impacting employee productivity.

The Influence of Work Environment (X2) on Communication (M)

Based on statistical tests, the calculated t value of $3.842 > t\text{ table } 1.659$ with a significance of 0.000, indicating that the work environment has a significant effect on communication. Employees at BPP Bireuen stated that the availability of a decent workspace, flexible working hours, and a mutually respectful work atmosphere allow for more intense and meaningful communication. A well-organized work environment that is not too crowded and does not cause psychological stress encourages employees to be more open in interactions. Many extension workers also find it easier to discuss, share information, and convey suggestions in a supportive work environment. Active and constructive communication is impossible to form in a rigid or stressful work environment. Therefore, these results strengthen the findings of Muhammad Abdul Rosid (2024) who stated that a good work environment encourages open communication which ultimately increases organizational effectiveness.

The Influence of Communication (M) on Productivity (Y)

The results of statistical tests show that communication has a significant effect on employee work productivity, indicated by a calculated t-value of $4.817 > t\text{-table } 1.659$ and a significance value of $0.000 < 0.05$. This indicates that the better the quality of communication at the Agricultural Extension Center, the higher the employee productivity. Effective communication between superiors and subordinates, as well as between employees, plays an important role in the smooth implementation of extension tasks and administrative activities. At BPP Bireuen, respondents stated that the existence of open communication channels such as regular briefings, two-way discussions, and structured coordination provides clarity of tasks, avoids miscommunication, and encourages collaboration. Smooth communication makes employees feel involved in the decision-making process and their contributions are valued. When open communication is fostered, employees become more responsible and have a clear understanding of work targets and organizational expectations. This finding aligns with research by Suwanto et al. (2023), Zulkifli Sultan (2024), Aysha Sadia et al. (2023), Ritonga and Jingga (2024), Massora (2024), and Susan Febriantina (2025), which shows that organizational communication has a significant impact on increasing work productivity.

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The Influence of Leadership (X1) on Employee Productivity (Y) through Communication (M) as a Mediating Variable

The results of the mediation test indicate that communication significantly mediates the relationship between leadership and productivity. At BPP Bireuen, many employees feel that communicative leadership not only provides direction but also facilitates the direct exchange of information, feedback, and coaching. Instructional leadership without effective communication will struggle to maximize productivity. However, with strong communication, leaders' instructions are more easily understood and implemented. Employees feel more confident, have a clear work direction, and are motivated to achieve organizational goals. This finding supports the research results of Harris Kristianto and Yusuf Ronny Edward (2020) which stated that communication is an important mediating variable in strengthening the influence of leadership on employee work productivity.

The Influence of Work Environment (X2) on Employee Productivity (Y) through Communication (M) as a Mediating Variable

Communication has also been shown to mediate the relationship between the work environment and employee productivity. The open, pleasant, and well-equipped work environment at BPP Bireuen strengthens the frequency and quality of communication between employees. Employees feel more comfortable expressing suggestions, discussing issues, and seeking solutions together in a supportive work environment. Communication becomes more fluid, which impacts ease of coordination and efficiency in implementing extension tasks. A smooth communication process allows for increased productivity because tasks can be completed without communication barriers. This aligns with research by Win Naing Soe and Amiya Bhaumik (2024), which states that communication is the primary link between the quality of the work environment and employee performance. A supportive work environment will enhance communication, and effective communication will directly impact productivity.

CONCLUSION

Based on the results of the data analysis and discussion that has been carried out, several important points can be concluded as follows:

1. Leadership significantly impacts employee productivity. A leadership style that provides direction, role models, and attention to work facilities has been shown to improve employee morale and productivity at the Bireuen Regency BPP.
2. The work environment has a positive influence on employee productivity. A safe, comfortable work environment supported by adequate facilities and infrastructure encourages extension workers to work more efficiently.
3. Communication directly impacts employee productivity. Effective communication mechanisms between employees and between superiors and subordinates strengthen coordination and work efficiency in the field.
4. Leadership also influences internal organizational communication. Leaders who are open, listen to aspirations, and provide clear information will foster healthy communication within the organization.
5. A conducive work environment also encourages the creation of good communication, where order and good physical working conditions create a positive atmosphere of interaction.
6. Communication has been proven to mediate the influence of leadership on employee productivity. This means that leadership's influence on productivity will be more optimal if channeled through effective communication.
7. Communication also mediates the influence of the work environment on productivity, indicating that the creation of high productivity does not only depend on good working conditions, but also depends on how communication within the organization is built sustainably.

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