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Impact of Education and Training on Employee Performance at the North Sumatra Center for Teachers and Educational Personnel (BBGTK)

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ABSTRACT

Staff performance is one of the key factors in supporting organisational effectiveness, particularly within government agencies involved in the development of human resources in education. However, although various education and training programmes have been implemented at the North Sumatra Centre for Teachers and Educational Personnel, staff performance outcomes are still predominantly in the 'good' category; therefore, it is necessary to examine the impact of education and training on staff performance. This study aims to analyse the influence of education and training on the performance of employees at the North Sumatra BBGTK. The study employs a quantitative approach using a survey method. The study population consists of 77 employees using total sampling, whilst data was obtained through questionnaires and documentation. Data analysis was conducted using multiple linear regression with the aid of SPSS. The results indicate that education has a positive and significant effect on staff performance, with a significance value of 0.000 and a regression coefficient of 0.474. Training also has a positive and significant effect on staff performance, with a significance value of 0.000 and a regression coefficient of 0.475. Simultaneously, education and training have a significant effect on employee performance with an R-squared value of 64.3%. This study contributes as an evaluation tool for organisations in improving the quality of human resources through continuous education and training.

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1. INTRODUCTION

Employee performance is the result of work achieved by a person both in quality and quantity in accordance with the responsibilities given (Mangkunegara, 2011). Wibowo, 2017 Explains that performance is influenced by the ability, motivation, and opportunity that employees have in carrying out their duties. Thus, improving competencies through education and training is an important factor in encouraging employee performance improvement. In the context of the State Civil Apparatus, performance management is regulated in the Regulation of the Minister of State Apparatus Empowerment and Bureaucratic Reform (PermenPANRB) Number 6 of 2022 concerning Performance Management of ASN Employees. The regulation emphasizes that the assessment of ASN performance is based on the achievement of work results and work behavior that is oriented

towards contribution to the organization. This shows that improving employee competencies through education and training is an integral part of the ASN performance management system (Utami, 2019).

Based on data on the staffing of BBGTK (North Sumatra in 2025, the level of education of employees consists of 12% of high school graduates, 18% of Diplomas, 54% of Bachelors, and 16% of Postgraduates. This condition shows that some employees still have educational backgrounds that are not fully in accordance with the increasingly complex demands of functional and technical positions. These differences in education levels have the potential to cause variations in work ability, task understanding, and quality of employee work results, so it is necessary to study the influence of education on employee performance (Abdul et al., 2020; Wirawan et al., 2019).

The North Sumatra Teachers and Education Personnel Center locally known as Balai Besar Guru dan Tenaga Kependidikan (BBGTK) as a government institution that has a strategic role in developing the competencies of educators and education personnel requires employees who have optimal performance. In the implementation of its duties and functions, BBGTK North Sumatra routinely organizes various education and training programs to improve employee competence.

On the other hand, as an effort to improve employee competence, BBGTK North Sumatra has carried out various education and training activities, such as CPNS Basic Training (Latsar), PPPK Orientation Training, Technical Training on the Utilization of Artificial Intelligence, Technical Guidance Training of Trainers (ToT), Electronic-Based Government System (SPBE) Training, as well as various other technical guidance activities and workshops.

However, despite the various education and training programs that have been implemented, employee performance achievements are still dominated in the "Good" category. This condition raises questions about the extent to which education and training have an influence on improving employee performance in the North Sumatra BBGTK. The urgency of training is increasing in the era of digital transformation. Recent research by Widihartono & Ahmadi, 2024 It shows that training programs specifically designed to deal with the digital context can increase employee productivity by up to 34%, much higher than conventional training.

Based on this description, this research is important to analyze the influence of education and training on the performance of BBGTK employees in North Sumatra, so that the results are expected to be material for evaluating and improving human resource development policies in the organizational environment.

2. METHOD

2.1 Types and Research Approaches

This study uses a quantitative approach with a survey method (Sofya et al., 2024). A quantitative approach was used to analyze the influence of education and training on employee performance based on numerical data obtained through questionnaires as primary data.

2.2 Research Location and Time

This research was carried out at the North Sumatra Teachers and Education Personnel Center (BBGTK) from March to April 2026.

2.3 Population and Research Sample

The population in this study is all employees of BBGTK North Sumatra as many as 77 people (based on 2025 performance evaluation data). The sampling technique uses total sampling, i.e. the entire population is used as a research respondent. This method was chosen because the population is relatively small and allows for overall research (Sumargo, 2020).

2.4 Data collection techniques

Research data was collected through: The questionnaire, which was distributed to all BBGTK employees in North Sumatra using a five-point Likert scale as primary data (Rifkhan, 2023). Documentation, in the form of employee performance data, employee education data, and data on education and training activities as secondary data (Rahardjo, 2011).

2.5 Variable Operational Definition

Table 1. Variable Operational Definitions

Variabel	Definition	Indicator
Education (X1)	Formal education level and competency suitability of employees	Education level, educational suitability, knowledge
Training (X2)	Employee job skills development program	Materials, methods, instructors, benefits
Employee Performance (Y)	Employee work results according to duties and responsibilities	Quality, quantity, punctuality, responsibility

2.6 Research Instruments

The research instrument is in the form of a closed questionnaire which is compiled based on the indicators of each variable and measured using a Likert scale of 1 to 5 (Pujihastuti, 2010).

2.7 Test Research Instruments

2.7.1 Validity Test

The validity test was performed using Pearson Product Moment correlation. A statement item is declared valid if the calculated r value is greater than the r of the table.

2.7.2 Reliability Tests

Reliability tests were performed using Cronbach's Alpha. The instrument is declared reliable if the value of α is greater than 0.70.

2.8 Data Analysis Techniques

Data analysis includes: Statistics descriptive; Classic assumption test (Normality test, Multicollinearity test, Heteroscedasticity test); Multiple linear regression analysis; T test (partial influence); F test (simultaneous influence); Coefficient of determination (R^2). Data analysis was carried out with the help of SPSS software.

3. RESULTS AND DISCUSSION

3.1 Characteristics of Respondents

This research was conducted on employees within the North Sumatra Teachers and Education Personnel Center (BBGTK) with a total of 77 respondents. Respondent data was obtained through the distribution of questionnaires directly to all employees. The characteristics of the respondents in this study included gender, education level, and working period. The presentation of respondent characteristics aims to provide an overview of the profile of respondents who are the object of research.

Table 2. Characteristics of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	41	53,2
Women	36	46,8
Total	77	100

Based on Table 2, it is known that most of the respondents were male as many as 41 people (53.2%), while female respondents were 36 people (46.8%). This shows that the respondents in this study are dominated by men.

Table 3. Characteristics of Respondents Based on Education

Education	Frequency	Percentage (%)
High School	16	20,8
S1	24	31,2
S2	33	42,9
S3	4	5,2
Total	77	100

Based on Table 3, the majority of respondents have a S2 education level of 33 people (42.9%), followed by S1 as many as 24 people (31.2%), high school as many as 16 people (20.8%), and S3 as many as 4 people (5.2%). This shows that most of the respondents have a fairly high level of education.

Table 4. Characteristics of Respondents by Length of Service

Tenure	Frequency	Percentage (%)
<5 years old	16	20,8
5–10 years	7	9,1
11–20 years	23	29,9
>20 years old	31	40,3
Total	77	100

Based on Table 4, it is known that the majority of respondents have a service period of more than 20 years, as many as 31 people (40.3%). Furthermore, 23 respondents with a working period of 11-20 years (29.9%), a working period of less than 5 years were 16 people (20.8%), and a working period of 5-10 years were 7 people (9.1%).

3.2 Validity Test

Table 5. Results of the Validity Test of Educational Variables (X1)

Item	Corrected Item-Total Correlation	Remarks
X1_1	0,762	Valid
X1_2	0,624	Valid
X1_3	0,829	Valid
X1_4	0,846	Valid
X1_5	0,855	Valid
X1_6	0,866	Valid
X1_7	0,830	Valid
X1_8	0,849	Valid

Table 6. Validity Test Results of Training Variables (X2)

Item	Corrected Item-Total Correlation	Remarks
X2_1	0,860	Valid
X2_2	0,815	Valid
X2_3	0,853	Valid
X2_4	0,863	Valid
X2_5	0,877	Valid
X2_6	0,854	Valid
X2_7	0,832	Valid
X2_8	0,857	Valid

Table 7. Results of Performance Variable Validity Test (Y)

Item	Corrected Item-Total Correlation	Remarks
Y_1	0,864	Valid
Y_2	0,883	Valid
Y_3	0,837	Valid
Y_4	0,889	Valid
Y_5	0,897	Valid
Y_6	0,902	Valid
Y_7	0,894	Valid
Y_8	0,869	Valid

The validity test was carried out to determine the ability of the statement item in measuring the research variables. The test was conducted using a Corrected Item-Total Correlation value with a value criterion greater than 0.30. Based on the test results in Table 5, Table 6, and Table 7, all statement items in the variables Education (X1), Training (X2), and Employee Performance (Y) have a Corrected Item-Total Correlation value greater than 0.30. Thus, all statement items in this study are declared valid and suitable for use as research instruments.

3.3 Reliability Test

Table 8. Reliability Test Results

Variabel	Cronbach's Alpha	Remarks
Education (X1)	0,946	Highly Reliable
Training (X2)	0,962	Highly Reliable
Employee Performance (Y)	0,970	Highly Reliable

The reliability test was carried out to determine the level of consistency of the research instrument using the Cronbach's Alpha method. An instrument is said to be reliable if it has a Cronbach's Alpha value greater than 0.70. Based on the test results in Table 8, the Cronbach's Alpha value for the Education variable (X1) was 0.946, the Training variable (X2) was 0.962, and the Employee Performance variable (Y) was 0.970. All of these values are above 0.90, so it can be concluded that the research instrument has a very high level of reliability and is suitable for use in research.

3.4 Classical Assumption Test

3.4.1 Normality Test

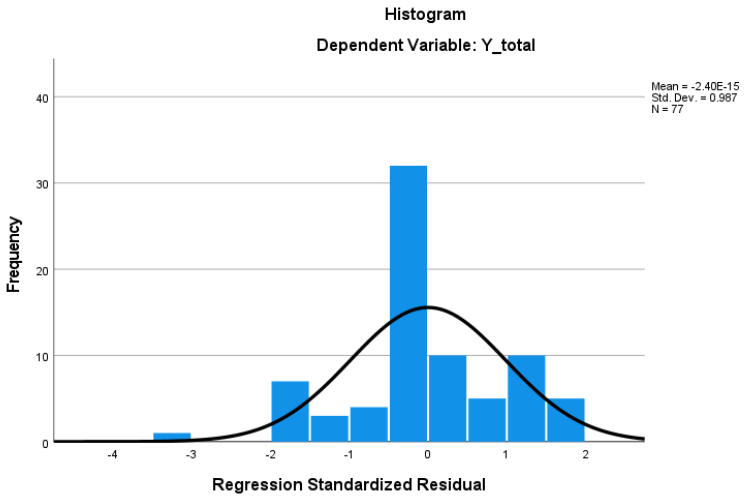

Figure 1. Normality Test Histogram

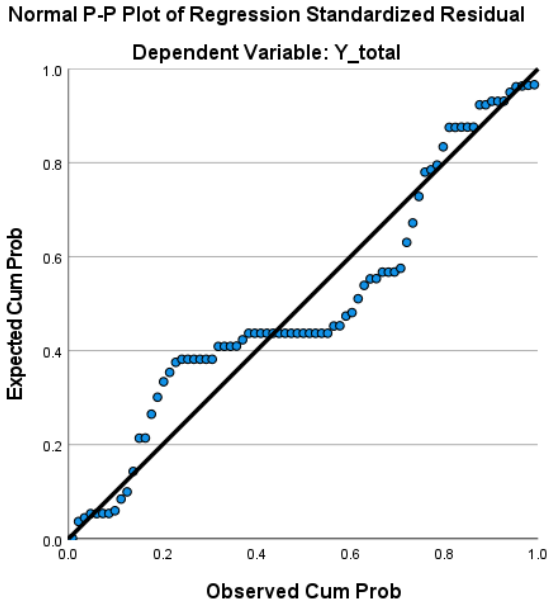

Figure 2. Normal P-P Normality Test Plot

Normality tests are carried out to find out if the data is distributed normally. Based on the results of the test through histogram graphs, it can be seen that the data forms a pattern resembling a bell shape. In addition, on a Normal Probability Plot (P-P Plot) chart, the dots are spread around a diagonal line and follow the direction of the line. This shows that the data in this study is normally distributed.

3.4.2 Multicollinearity Test

Tael 9. Multicollineity Test

Model		Collinearity Statistics	
		Tolerance	LIVE
1	(Constant)		
	X1_total	.685	1.460
	X2_total	.685	1.460

The multicollinearity test aims to determine the relationship between independent variables. Based on the test results, a Tolerance value of 0.685 (>0.10) and a Variance Inflation Factor (VIF) value of 1.460 (<10) were obtained for each variable. Thus, it can be concluded that there is no multicollinearity in the regression model.

3.4.3 Heteroscedasticity Test

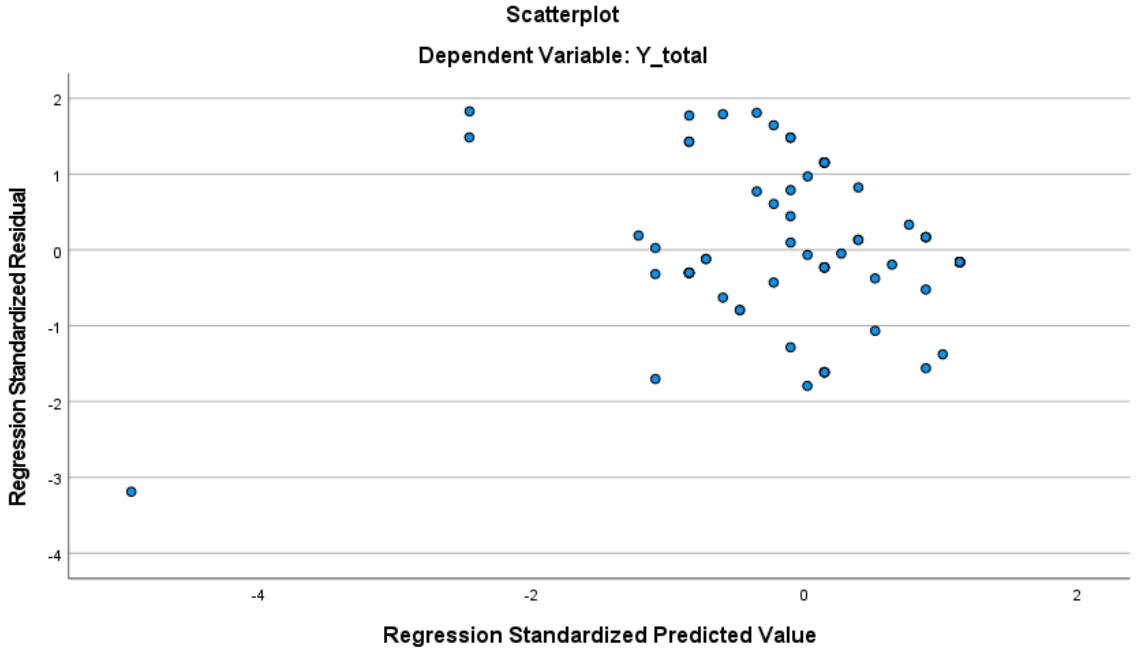

Figure 3. Heteroscedasticity Test Scatterplot

The heteroscedasticity test was carried out using a scatterplot graph. Based on the test results, it can be seen that the dots are scattered randomly and do not form a specific pattern, either conical or dilated patterns. This shows that heteroscedasticity does not occur in the regression model.

3.4.4 Linearity Test

Table 10. Linearity Test

Variabel	Linearity Sig	Deviation from Linearity Sig	Remarks
X1_total	0.000	0.002	Linear
X2_total	0.000	0.001	Linear

Based on the results of the linearity test, a significant deviation from linearity value (<0.05) was obtained which indicated a deviation from the linear relationship. However, the significance value on the main linearity test still showed significant results (<0.05), so that the relationship between independent and dependent variables in general still showed a linear tendency.

In social research, deviations from classical assumptions can occur because data are influenced by a variety of complex factors and cannot be completely controlled (Irrawati & Mukaramah, 2024). However, the results of the regression analysis show a strong level of significance and a consistent direction of the relationship, so the regression model is still feasible to be used to explain the relationship between variables in this study.

3.5 Multiple Linear Regression Analysis

Table 11. Determination Coefficient (R^2) Test Results

R	R Square	Adjusted R Square
0,802	0,643	0,633

Based on Table 11, the R Square value of 0.643 was obtained. This shows that the variables Education (X1) and Training (X2) were able to explain the variation in Employee Performance (Y) by 64.3%, while the remaining 35.7% was influenced by other variables outside the study.

Table 12. Simultaneous Test Results (F Test)

F Calculate	Sig
66,504	0,000

Based on Table 12, an F value of 66.504 was obtained with a significance value of 0.000 (<0.05). This shows that the variables of Education (X1) and Training (X2) simultaneously have a significant effect on Employee Performance (Y).

Table 13. Partial Test Results (t-test)

Variabel	B	t	Sig	Remarks
Education (X1)	0,474	5,803	0,000	Influential
Training (X2)	0,475	4,992	0,000	Influential

Based on Table 13, the Education variable (X1) has a significance value of 0.000 (<0.05), so it can be concluded that Education has a significant effect on Employee Performance. The Training variable (X2) also has a significance value of 0.000 (<0.05), so it can be concluded that Training has a significant effect on Employee Performance.

3.6 Discussion

3.6.1 Influence of Education on Employee Performance

The results of the study show that the Education variable (X1) has a positive and significant effect on Employee Performance. This is evidenced by a significance value of 0.000 (<0.05) and a regression coefficient value of 0.474. These findings indicate that the higher the level of education possessed by employees, the better the performance produced (Miranti & Yacoub, 2016). Education plays a role in improving cognitive abilities, technical skills, and a more systematic mindset in completing work.

Theoretically, education is one of the main factors in human resource development, where individuals with higher levels of education tend to have better analytical and problem-solving skills, thus having an impact on improving performance (Usman et al., 2023).

3.6.2 Effect of Training on Employee Performance

The results of the study show that the Training variable (X2) has a positive and significant effect on Employee Performance. This is evidenced by a significance value of 0.000 (<0.05) and a regression coefficient value of 0.475.This shows that the training provided to employees is able to improve work competence both in terms of knowledge, skills, and work attitudes. Rosmayati et al., 2021 stating that targeted training will help employees in increasing effectiveness and efficiency in carrying out their duties. Thus, training is one of the organization's strategic efforts to improve the quality of human resources, so that it can support the achievement of optimal performance.

3.6.3 Influence of Education and Training on Employee Performance

Based on the results of the simultaneous test (F test), it is known that the variables of Education and Training together have a significant effect on Employee Performance, with a significance value of 0.000 (<0.05). In addition, the value of the determination coefficient (R Square) of 0.643 showed that 64.3% of the variation in Employee Performance could be explained by the Education and Training variable, while the remaining 35.7% was influenced by other factors outside the study.

This shows that a combination of a good level of education and training will make a significant contribution to improving employee performance. Therefore, organizations need to pay serious attention to improving education and implementing continuous training to improve employee performance optimally.

The results of this study are supported by previous research showing that education and training have a significant influence on employee performance. Jelatu & Ibrahim, 2024 stated that the level of education has a positive effect on the performance of government agency employees. Rahman et al., 2025 It was also found that job training was able to increase employee productivity and work quality. In addition, Noor et al., 2023 emphasized that education and training simultaneously have a significant effect on the performance of the state civil apparatus.

4. CONCLUSION

Based on the results of the research and discussions that have been carried out, it can be concluded that: Education has a positive and significant effect on employee performance. This shows that the higher the level of education of employees, the better the performance produced. Training has a

positive and significant effect on employee performance. This shows that the training provided is able to improve the competence and work effectiveness of employees. Education and training simultaneously have a significant effect on employee performance. This shows that these two variables together have a strong contribution to improving employee performance. For agencies, it is hoped that they can improve the quality of employee education through support for formal and non-formal education to improve optimal performance. Agencies are expected to be able to organize training programs that are sustainable and in accordance with job needs, so that they can improve employee competence. For the next researcher, it is recommended to add other variables that can affect employee performance, such as work motivation, leadership, and work environment, so that they can provide more comprehensive research results.

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