

PREDICTING EMPLOYEE PRODUCTIVITY BASED ON REMOTE WORK AND TRAINING VARIABLES USING SPSS

1. Background and Problem Statement:

A multinational IT services company observed varying productivity levels across departments after adopting hybrid work policies. Despite providing training resources and manager check-ins, management lacked clarity on which factors significantly influence employee output. The company aimed to develop a statistical model to identify which controllable workplace factors (such as remote work frequency, training hours, and managerial support) predict productivity and can guide performance-enhancing interventions.

2. Objectives:

- To quantify the impact of remote work frequency, training hours, and perceived managerial support on employee productivity
- To control for demographic variables such as department and years of experience
- To develop a regression model that predicts productivity scores and supports evidence-based decision-making for HR interventions
- To identify multicollinearity issues and test model fit using SPSS diagnostics

3. Methodology:

3.1 Data Collection:

- **Sample Size:** 300 employees across 5 departments
- **Variables Collected:**
 - Dependent Variable: Employee Productivity Score (scale: 0–100)
 - Independent Variables:
 - Remote Work Frequency (days/week)
 - Training Hours/Month
 - Manager Support Rating (scale: 1–10)
 - Years of Experience

- Department (dummy-coded)

3.2 SPSS Analysis Plan:

- Descriptive statistics to explore central tendencies and distributions
- Correlation matrix to evaluate preliminary relationships between predictors
- Multiple Linear Regression using 'Enter' method with:
 - Block 1: Control variables (Department, Experience)
 - Block 2: Main predictors (Remote Work, Training Hours, Manager Rating)
- Multicollinearity check using Variance Inflation Factor (VIF)
- Residual diagnostics: normality, homoscedasticity, and outlier detection

4. Results:

Model Summary:

- $R^2 = 0.62$, Adjusted $R^2 = 0.60$
- $F(6, 293) = 79.34$, $p < 0.001$

Significant Predictors:

- Remote Work Frequency: $\beta = 4.12$, $p < 0.01$
- Training Hours: $\beta = 2.83$, $p = 0.03$
- Manager Support: $\beta = 5.76$, $p < 0.001$

Non-significant Predictors:

- Years of Experience ($p = 0.27$)
- Some department dummy variables (reference category = IT)

Diagnostics:

- VIF values < 2 for all predictors
- Residuals were approximately normal
- No evidence of heteroskedasticity or extreme outliers

5. Interpretation and Insights:

- Employees who worked remotely more frequently and received more training hours per month tended to have higher productivity scores.
- Managerial support was the strongest predictor of productivity, suggesting that soft factors are more influential than tenure.
- Department-specific effects were observed, but most became insignificant when managerial support was added.
- The model explains a substantial proportion of variance in productivity ($R^2 = 0.62$), indicating practical relevance.

6. Recommendations:

- Increase structured remote work options, especially in departments where performance remained stable
- Invest in monthly upskilling programs tied to role-specific competencies
- Prioritize leadership training for managers to improve support perceptions
- Use this regression model as a monitoring tool during quarterly performance reviews

7. Future Work:

- Include interaction terms between department and remote work to explore department-specific policy effects
- Collect data on job role complexity and team collaboration for model enhancement
- Expand analysis using hierarchical linear modeling if nested data (team within departments) becomes available

8. Stakeholder Relevance:

Academic:

- Demonstrates practical application of SPSS MLR in HR analytics
- Useful case for courses in organizational behavior, applied statistics, or workplace analytics

Corporate:

- Enables HR teams to implement evidence-based productivity initiatives
- Model can be embedded in HR dashboards for continuous insight

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