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# The Impact of Technostress on Employees' Psychological Well-being, with Digital Leadership as a Moderating Variable

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**Abstract**

Digital transformation within educational institutions has altered the work patterns of teachers and administrative staff, enhancing efficiency while simultaneously triggering new psychological pressures known as "technostress." This study aims to empirically examine the impact of technostress on employee psychological well-being and to analyze the role of digital leadership as a moderating variable. A quantitative approach was employed, utilizing a total sampling technique (census sampling) that encompassed the entire workforce at Primary Plus Sutomo 1 Medan, consisting of 56 respondents. Primary data were collected via a 5-point Likert-scale questionnaire and analyzed using Moderated Regression Analysis (MRA) based on mean-centering, with the support of IBM SPSS Statistics. The partial hypothesis testing (t-test) results indicate that technostress has a significant negative impact on employee psychological well-being ($\beta1 = -13.164$; $t = -11.224$; $p < 0.001$), whereas digital leadership has a significant positive impact ($\beta2 = 9.168$; $t = 6.853$; $p < 0.001$). Furthermore, the MRA interaction test confirms that digital leadership serves as a "buffering moderator," mitigating the negative influence of technostress on employee psychological well-being ($\beta3 = +8.057$; $t = 5.858$; $p < 0.001$). An Adjusted R-square value of 0.783 indicates that the research model accounts for 78.3% of the variance in employee psychological well-being. The implications of this study underscore the importance of implementing empathetic digital leadership, providing technical training, and establishing healthy guidelines for digital communication outside of working hours (digital detachment) to safeguard the mental well-being of employees in the digital era.

**Keywords** Digital Leadership; Employee Psychological Well-being; Moderated Regression Analysis; Technostress.

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## INTRODUCTION

The rapid development of digital technology has brought significant changes to organizational activities across various sectors, including education. Educational institutions increasingly rely on digital systems such as learning management systems (LMS), online communication platforms, and smartboards to improve operational efficiency and effectiveness. However, intensive technology use also

triggers technostress, namely psychological pressure that arises when employees experience difficulty adapting to technological demands in the workplace (Kumar, 2024).

Technostress can manifest in the forms of techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty (Kumar, 2024; Ragu-Nathan et al., 2008). These excessive technological demands act as job demands that can deplete employees' physical and emotional resources, thereby reducing employee psychological well-being (Wang et al., 2023). Employee psychological well-being encompasses six main dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (Ryff, 1989; Zheng et al., 2015).

To mitigate the negative effects of technostress, organizations need digital leadership, defined as leaders' ability to guide, support, and facilitate employees in responding to digital change (Farmanesh et al., 2025; Tigre et al., 2023). Based on Job Demands-Resources (JD-R) Theory and Conservation of Resources (COR) Theory, digital leadership acts as a vital job resource that can provide psychological safety and mitigate declines in well-being (Alkhayyal & Bajaba, 2024; Rademaker et al., 2025).

At Primary Plus Sutomo 1 Medan, a preliminary survey indicated low levels of environmental mastery (23.3%) and employee self-acceptance (20.0%), associated with high levels of techno-invasion (86.7%) and techno-overload (80.0%). This study aims to analyze the effect of technostress on employee psychological well-being, with digital leadership serving as a moderating variable.

## METHODS

This study was conducted at Primary Plus Sutomo 1 Medan using a quantitative approach. The study population comprised all active employees, consisting of 52 teachers and 4 administrative staff members (N = 56). The sampling technique used was saturated sampling (total sampling), in which all 56 members of the population served as respondents (Sugiyono, 2023).

Data were collected using a 5-point Likert-scale questionnaire (1 = Strongly Disagree to 5 = Strongly Agree). The Technostress variable (X) was measured using five indicators (techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty). Employee Psychological Well-being (Y) was measured using six indicators (self-acceptance, positive relations, autonomy, environmental mastery, purpose in life, and personal growth). Digital Leadership (Z)

was measured using five indicators (digital mindset, digital competence, digital communication, innovation support, and digital transformation awareness).

Data were processed using IBM SPSS Statistics. Instrument testing (Pearson Product-Moment validity and Cronbach's Alpha reliability) and classical assumption tests (Kolmogorov-Smirnov normality, VIF/Tolerance multicollinearity, and Glejser heteroscedasticity tests) were conducted before hypothesis testing. The moderation regression model was formulated as follows (Hayes, 2018):

$$Y = a + \beta_1 X_c + \beta_2 Z_c + \beta_3 (X_c Z_c) + e$$

## FINDINGS AND DISCUSSION

### Respondent Characteristics

The respondents were predominantly female (66.07%), aged 25–35 years (33.93%), held a bachelor's degree (85.71%), and had more than 10 years of work experience (37.50%).

### Instrument and Classical Assumption Test Results

The validity test showed that all statement items for variables X, Y, and Z had calculated r-values greater than 0.263, with p-values < 0.001. The reliability test produced Cronbach's Alpha values of 0.988 (X), 0.992 (Y), and 0.981 (Z), all exceeding the minimum threshold of 0.70. The regression model residuals were normally distributed (Kolmogorov-Smirnov p = 0.200 > 0.05), showed no multicollinearity (Tolerance > 0.10; VIF < 10.0), and showed no heteroscedasticity (Glejser p > 0.05).

### Moderated Regression Analysis (MRA) Results and Hypothesis Testing

The MRA results are presented in Table 1 below:

**Table 1. MRA Test Results**

| *Coefficients*[a] | | | | | | |
|---|---|---|---|---|---|---|
| | | *Unstandardized Coefficients* | | *Standardized Coefficients* | | |
| *Model* | | B | *Std. Error* | *Beta* | t | *Sig.* |
| 1 | (Constant) | 56.879 | .909 | | 62.551 | <.001 |
| | Xc | -13.164 | 1.173 | -.749 | -11.224 | <.001 |
| | Zc | 9.168 | 1.338 | .504 | 6.853 | <.001 |
| | XcZc | 8.057 | 1.375 | .424 | 5.858 | <.001 |
| a. Dependent Variable: Y | | | | | | |

Source: Data processed from IBM SPSS (2026)

The regression model was found to be highly adequate (F-test: F = 67.326; p < 0.001), with an Adjusted R Square of 0.783.

## Discussion

### 1. The Effect of Technostress on Employee Psychological Well-being

The t-test results demonstrate that technostress has a negative and statistically significant partial effect on employee psychological well-being ($\beta1 = -13.164$; $t = -11.224$; $p < 0.001$); therefore, H1 is accepted. Based on the descriptive statistics, the greatest sources of stress were techno-complexity (the additional effort required to master new technologies) and techno-insecurity (anxiety about falling behind in technological capabilities). This is consistent with the findings of Alkhayyal and Bajaba (2024) and Wang et al. (2023). From the perspective of JD-R Theory, technostress depletes employees' cognitive and emotional energy when operating LMS platforms and smartboards, thereby undermining environmental mastery.

### 2. The Effect of Digital Leadership on Employee Psychological Well-being

The t-test results demonstrate that digital leadership has a positive and statistically significant effect on employee psychological well-being ($\beta2 = 9.168$; $t = 6.853$; $p < 0.001$); therefore, H2 is accepted. Leaders with an open digital mindset who support innovation serve as a job resource that provides psychological safety for teachers and staff. These findings reinforce the studies by Rademaker et al. (2025) and Tigre et al. (2023).

### 3. The Moderating Role of Digital Leadership

The interaction coefficient XcZc is positive ($\beta3 = +8.057$; $t = 5.858$; $p < 0.001$), which is opposite in direction to the technostress coefficient ($\beta1 = -13.164$). This demonstrates that H3 is accepted, with digital leadership functioning as a buffering moderator and a quasi-moderator that mitigates the adverse effect of technostress on psychological well-being. Leaders who facilitate technical guidance and demonstrate

digital empathy can transform perceptions of technological barriers from threats into manageable challenges (Farmanesh et al., 2025).

## CONCLUSION

This study concludes that: (1) technostress has a negative and significant effect on employee psychological well-being at Primary Plus Sutomo 1 Medan; (2) digital leadership has a positive and significant effect on employee psychological well-being; and (3) digital leadership empirically functions as a moderating variable that weakens the negative effect of technostress on employees' psychological well-being.

School management is advised to: (1) establish internal regulations separating digital communication from non-working hours (digital detachment) to reduce techno-invasion; (2) provide empathy-oriented digital leadership training for supervisors; and (3) offer technical assistance (an IT helpdesk) and practical guidance for adapting to new applications. Future research is encouraged to use longitudinal survey methods and incorporate mediating variables such as work exhaustion or burnout.

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