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Technostress Creators, Technostress Inhibitors, and Transformational Leadership among Academic Administrators: Evidence from Preah Sihamoniraja Buddhist University, Cambodia

Sarom Mok[1], Bora Khath[1], Sothea Lim[1], Sereyrath Em[1], Darath Khim[1], Sokha Morn[1], Saravuth Um[1]
[1]Graduate School, Preah Sihamoniraja Buddhist University, Phnom Penh, Cambodia

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ABSTRACT

Purpose of the study: This study aimed to examine whether and to what extent Technostress Creators (TSC) and Technostress Inhibitors (TSI) predict the level of Transformational Leadership (TRL) among academic administrators at the Preah Sihamoniraja Buddhist University (PSBU) in Cambodia.

Methodology: The study used a quantitative predictive correlational design with 123 PSBU academic administrators (e.g., rectors, deans, and department heads) selected through total population sampling. Data were collected using two instruments: the Technostress Creators and Inhibitors scale (TSC/TSI) and the Multiple-Factor Leadership Questionnaire (MLQ 5X) for transformational leadership. The instruments were back-translated and validated for clarity and reliability. Data were analyzed using descriptive and inferential statistics with computer-based methods.

Main Findings: The findings revealed that techno-insecurity (T-INS) was the only statistically significant predictor, negatively associated with TRL. Other TSC and TSI variables were not statistically significant predictors. Overall, regression models for TSC and TSI did not significantly explain variation in TRL levels.

Novelty/Originality of this study: This study is significant at the theoretical and practical levels. Theoretically, this study broadens the understanding of technostress and transformational leadership style. Practically, this study can be used to examine how academic administrators in higher education perceive technostress and its effects.

Corresponding Author:
Sarom Mok,
Dean of Graduate School, Preah Sihamoniraja Buddhist University,
Russian Federation Boulevard, Phnom Penh, 12000, Cambodia
Email: moksaromddg@gmail.com

1. INTRODUCTION

In recent decades, the integration of Information and Communication Technologies (ICT) has become a defining feature of modern organizations, including higher education institutions. Universities worldwide increasingly rely on digital technologies to support administrative coordination, academic communication, data management, and decision-making processes. This transformation enables institutions to enhance efficiency, accessibility, and institutional performance [1], [2]. As a result, ICT is no longer optional but essential for maintaining competitiveness and achieving organizational goals in higher education [3]-[5]. Consequently,

institutions are continuously investing in technological innovations to remain relevant in a rapidly evolving digital landscape.

Despite its benefits, the rapid adoption of ICT has introduced new challenges, particularly in the form of technostress. Technostress refers to the stress experienced when individuals struggle to cope with technological demands that exceed their capabilities [2]. This condition may arise from factors such as increased workload, continuous system updates, digital connectivity, and perceived technological complexity. Empirical studies have shown that prolonged exposure to technostress can negatively affect job satisfaction, emotional well-being, and work performance [3]. Therefore, technostress has emerged as a critical issue in technology-driven environments, including higher education institutions [1].

In the context of these technological changes, leadership plays a crucial role in shaping how organizations and individuals respond to ICT-related demands. Transformational leadership (TRL) is widely recognized for its ability to guide organizations through change and complexity [6]-[8]. Leaders who exhibit TRL characteristics—such as idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration—are often better equipped to motivate others and foster adaptability [6], [9]-[11]. However, academic administrators themselves are not immune to technostress, especially as digital expectations continue to expand [4], [5]. Thus, understanding how leadership traits relate to technostress is essential for effective institutional management.

Although research on technostress has grown significantly, most existing studies have focused on employees, teachers, or students rather than institutional leaders [8], [9]. This imbalance limits the understanding of how leadership roles influence the experience of technostress in organizational settings. Furthermore, limited empirical evidence has examined the relationship between leadership traits and technostress within higher education institutions. The gap is even more evident in developing countries, where digital transformation is accelerating but research remains limited. Consequently, there is a need for studies that specifically explore technostress among academic leaders.

Cambodia provides a relevant context for examining technostress, as higher education institutions in the country are actively strengthening their digital infrastructure. Preah Sihamoniraja Buddhist University (PSBU), established in 2004, has increasingly integrated ICT into its academic and administrative systems. Academic administrators at PSBU, including rectors, vice-rectors, deans, and department heads, are required to balance leadership responsibilities with ongoing technological demands. This dual responsibility increases the likelihood of experiencing technostress in their professional roles. Therefore, PSBU represents an appropriate setting for investigating the relationship between leadership traits and technostress.

Despite the growing reliance on ICT in higher education, there is a lack of empirical research examining how leadership traits relate to technostress among academic administrators. This limitation restricts the ability of institutions to design effective leadership development programs and organizational strategies. In particular, the relationship between transformational leadership and technostress remains underexplored in higher education contexts. Without sufficient empirical evidence, institutions may struggle to address technology-related stress effectively. Therefore, this study seeks to address this gap by focusing on academic administrators in a developing country context.

This study aims to investigate the relationship between transformational leadership (TRL) and technostress among academic administrators at PSBU. Specifically, it examines how Technostress Creators (TSC) and Technostress Inhibitors (TSI) influence administrators' self-perceived levels of transformational leadership. By analyzing these relationships, the study seeks to provide a more comprehensive understanding of leadership dynamics in technology-driven environments. Accordingly, this study addresses two main research questions. First, to what extent do TSC collectively and individually explain variation in TRL levels? Second, to what extent do TSI collectively and individually explain variation in TRL levels?. This study contributes to the existing body of knowledge in several important ways. First, it extends the literature on technostress and transformational leadership by focusing on academic administrators, a group that has received limited research attention [7], [8]. Second, it provides empirical evidence from a developing country context, thereby enriching the global understanding of technostress in higher education. Third, the findings offer practical implications for institutions in developing strategies to mitigate technology-related stress [12]–[16]. Ultimately, this study supports efforts to enhance leadership effectiveness and organizational resilience in digital environments.

To provide a strong theoretical foundation, this study integrates the technostress model and the transformational leadership model. Technostress is conceptualized through two dimensions: Technostress Creators (TSC) and Technostress Inhibitors (TSI). TSC includes techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, and techno-invasion, while TSI includes literacy facilitation, technical support provision, and technology involvement facilitation [9], [17]. Transformational leadership is measured using the Multifactor Leadership Questionnaire (MLQ), which captures four key dimensions [11]. In this study, TRL serves as the criterion variable, while TSC and TSI function as predictive variables.

2. RESEARCH METHOD

The current study employed a quantitative design to examine the relationship between TSC, TSI, and TRL among academic administrators at PSBU in Cambodia. The methodology was selected to determine the extent to which TSC and TSI collectively and individually predict variations in transformational leadership levels.

2.1. Research Design

This study employed a quantitative predictive correlational research design to examine the extent to which technostress creators (TSC) and technostress inhibitors (TSI) predict transformational leadership (TRL) among academic administrators. Quantitative methodology is appropriate because it enables the systematic examination of relationships among variables through statistical procedures, allowing findings to be generalized and compared using structured measurement tools [14], [15]. Transformational leadership has been widely associated with organizational change, trust, and innovation [16], whereas technostress refers to stress arising from the use of information technologies in professional contexts [18]. The predictive correlational design was selected because it allows the researcher to determine the direction and strength of relationships between independent variables (TSC and TSI) and the dependent variable (TRL) [19], as well as to estimate the predictive contribution of each variable without implying causal relationships [20]-[23]. Consequently, this approach provides empirical evidence to better understand leadership dynamics in technology-rich higher education environments such as PSBU.

2.2. Research Participants

The research population of this study consisted of academic administrators working at Preah Sihamoniraja Buddhist University (PSBU), Cambodia, where information technology has increasingly become an essential component of teaching, learning, and administrative management. In higher education settings, organizational management of training and IT support related to technological use has been shown to have a greater impact on technostress experienced by higher education professionals than the mere introduction of new technologies [5]. Moreover, the use of information technology has expanded significantly and continues to increase in higher education, as digital tools have become integral to instructional delivery and institutional management [24]-[26]. Given this context, examining leadership in relation to technostress is important, particularly as administrators play key roles in guiding technological adaptation and organizational change.

This study employed a total population sampling technique, in which all 123 academic administrators at Preah Sihamoniraja Buddhist University (PSBU) were invited to participate, and all agreed to join the study. The research population and sample were therefore identical, consisting of administrators who held leadership responsibilities across different faculties and organizational levels, including positions such as rectors, vice rectors, deans, vice deans, department heads, and other academic administrators involved in technology-related administrative tasks. Total population sampling was considered appropriate because the study focused on a specific and accessible group whose professional roles required regular interaction with information technologies, making them highly relevant to the investigation of technostress creators (TSC), technostress inhibitors (TSI), and transformational leadership (TRL).

The sample size of 123 participants was considered adequate for quantitative statistical analysis, particularly for Multiple Linear Regression (MLR), which requires a sufficient number of cases to ensure statistical stability and meaningful interpretation of relationships among variables. Since all members of the target population were included, sampling bias was minimized, and the representativeness of the data was strengthened. Consequently, the use of total population sampling supported the predictive correlational research design, enabling the study to examine the extent to which technostress creators (TSC) and technostress inhibitors (TSI) predict transformational leadership (TRL) among PSBU academic administrators.

2.3. Research Instruments and Data Collection

Data were collected using a structured questionnaire survey administered to 123 academic administrators at Preah Sihamoniraja Buddhist University (PSBU), Cambodia, employing a self-report method. The questionnaire consisted of standardized instruments measuring technostress creators (TSC), technostress inhibitors (TSI), and transformational leadership (TRL). The Consequences for End Users in Organizations Scale, developed by [9], was used to measure technostress, while the Multifactor Leadership Questionnaire (MLQ) Form 5X was used to measure transformational leadership [11], [28]. The use of structured questionnaires was appropriate for quantitative predictive correlational research because it allows consistent measurement of variables across participants and facilitates statistical comparison using numerical data. Responses to all construct items were measured using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Mean scores were calculated for each construct to represent participants' perceived levels of technostress and transformational leadership.

The technostress instrument consisted of eight sub-constructs, including five technostress creators (techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty) and three technostress inhibitors (literacy facilitation, technical support provision, and involvement facilitation) [10]. Earlier

work [18] identified the five TSC sub-constructs using factor analysis to confirm the underlying structure and establish convergent validity, [10] later extended the instrument by introducing three TSI sub-constructs and validated the measurement model using confirmatory factor analysis. The instrument contained 36 items, with each sub-construct measured using four to five items.

Transformational leadership (TRL) was measured using the MLQ Form 5X, which captures leadership behaviors across several dimensions, including idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration [11], [28]. The MLQ is widely used in leadership studies and has demonstrated acceptable psychometric properties, although some scholars have critically examined aspects of its validity [29]-[31]. In addition, the questionnaire included demographic questions, specifically gender and years of experience in higher education, to describe the characteristics of the participants.

Internal consistency reliability of all scales was examined using Cronbach's alpha in SPSS. All retained variables demonstrated acceptable reliability values, indicating that the instruments were appropriate for statistical analysis.

Table 1. Outline of Research Instruments

Variable	Instrument	Sub-constructs	No. of Items	Scale
Technostress Creators (TSC)	Consequences for End Users in Organizations Scale [9]	Techno-overload, Techno-invasion, Techno-complexity, Techno-insecurity, Techno-uncertainty	20 Items	5-point Likert
Technostress Inhibitors (TSI)	Consequences for End Users in Organizations Scale [9]	Literacy facilitation, Technical support provision, Involvement facilitation	16 Items	5-point Likert
Transformational Leadership (TRL)	Multifactor Leadership Questionnaire (MLQ) Form 5X [10], [21]	Idealized influence, Inspirational motivation, Intellectual stimulation, Individualized consideration	Multiple Items	5-point Likert
Demographic Variables	Self-report	Gender, Years of experience in higher education	2 Items	Categorical

Table 2. Validity and Reliability of Instruments

Construct	Sub-construct	Reliability (Cronbach's α)	Source
TSC	Techno-overload	0.89	[16]
TSC	Techno-invasion	0.81	[16]
TSC	Techno-complexity	0.84	[16]
TSC	Techno-insecurity	0.84	[16]
TSC	Techno-uncertainty	0.82	[16]
TSC	Techno-overload	0.82	[9]
TSC	Techno-invasion	0.80	[9]
TSC	Techno-complexity	0.77	[9]
TSC	Techno-insecurity	0.78	[9]
TSI	Literacy facilitation	0.85	[9]
TSI	Technical support provision	0.86	[9]
TSI	Involvement facilitation	0.87	[9]
TRL	Charisma/Inspirational	0.92	[21]
TRL	Intellectual stimulation	0.83	[21]
TRL	Individualized consideration	0.79	[21]
TRL	Contingent reward	0.80	[21]
TRL	Active management-by-exception	0.63	[21]
TRL	Passive avoidant	0.84	[21]

The reported reliability coefficients from prior studies indicate acceptable to high internal consistency. In addition, previous validation studies support the construct validity of the technostress and MLQ instruments [10], [18], [28]. In the current study, reliability was further examined using Cronbach's alpha before conducting the main analysis. Cronbach's alpha values computed in SPSS confirmed that all variables met acceptable reliability thresholds and were retained for further statistical analysis.

2.4. Data Analysis and Statistical Procedures

The research questions were addressed, and the underlying hypotheses were tested using the survey data collected from study participants. After data cleaning and coding, mean scores were calculated for each participant across the five technostress creators (TSC) sub-constructs, three technostress inhibitors (TSI) sub-constructs, and

transformational leadership (TRL) items derived from the Multifactor Leadership Questionnaire (MLQ). Composite scores for each construct were obtained by averaging responses to the items representing each sub-construct. The dataset was screened for missing values, and each participant was assigned a unique identification number before the data were entered into SPSS version 27 for statistical analysis.

To test the research hypotheses, Multiple Linear Regression (MLR) analysis was conducted to examine the extent to which TSC and TSI predict TRL. Prior to conducting hypothesis testing, the assumptions of MLR were examined to ensure the appropriateness of the analysis. Visual inspection of scatterplots indicated that the relationships were approximately linear and that the residuals were reasonably homoscedastic. Histogram and normal P–P plot inspection suggested that the residuals were approximately normally distributed. The Durbin–Watson statistics were 1.785 for the TSC model and 1.595 for the TSI model, indicating acceptable independence of errors. Multicollinearity was not a concern because all tolerance values were above 0.10 and all VIF values were below 5.00. In addition, Cook's distance values were below 1.00, indicating no influential outliers. Therefore, the assumptions for multiple linear regression were considered adequately met.

The analysis first evaluated the overall model fit, which was determined using the multiple correlation coefficient (R), the coefficient of determination (R^2) representing the proportion of variance explained, and the statistical significance of the regression model [33]. The decision-making criterion for hypothesis testing was based on the p-value, where $p < 0.05$ indicates statistical significance [33]. In addition, the regression coefficients (β values) were examined to determine the direction and strength of the relationships between the independent variables (TSC and TSI sub-constructs) and the dependent variable (TRL). The purpose of the analysis was to determine the extent to which technostress factors collectively and individually predict transformational leadership among the PSBU academic administrators, as well as to identify whether each predictor demonstrates a positive or negative influence within the regression model [33].

2.5. Ethical Considerations

To safeguard participants, no personal information about them was gathered during the survey. While the survey link was disseminated via email, the link provided did not reveal who the participant was, nor did the link provide IP address information on participants, so as to maintain participants' anonymity. Data was kept on a password-protected PC and on a jump drive placed in a safe box. After three years, the data will be destroyed.

The survey was sent electronically, which could cause technostress. Being cognizant of this potential hazard, the survey was designed with few distractions and was designed to be finished as soon as feasible [34] discovered that visuals and pictures inside surveys increase the time required to complete questionnaires. The time it takes to complete the survey was taken into account; the survey was designed in such a way that participants could progress through it while remaining on time.

3. RESULTS AND DISCUSSION

The results of this study were divided into two main parts: (1) Descriptive Results (Mean and Standard Deviation); and (2) Multiple Linear Regression (MLR) employing both Research Questions.

3.1. Descriptive Results

The study's problem statement was that it is not known whether and to what extent the TSC dimensions of Techno-overload (T-OVE), Techno-invasion (T-INV), Techno-complexity (T-COM), Techno-insecurity (T-INS), and Techno-uncertainty (T-UNC), as well as the TSI dimensions of Literacy Facilitation (LIF), Technical Support Provision (TSP), and Involvement Facilitation (INF), collectively and individually explain variation in TRL among PSBU academic administrators.

Table 3. Mean and Standard Deviation of TRL, TSC, and TSI Dimensions (n = 123)

Variable	M	S.D.
TSC	2.89	0.81
T-OVE	3.23	0.95
T-INV	3.19	1.04
T-COM	2.60	0.75
T-INS	1.75	0.58
T-UNC	3.67	0.74
TSI	3.23	0.84
LIF	3.40	0.82
TSP	3.50	0.99
INF	2.81	0.72
TRL	3.10	0.41

This study included nine variables, eight of which were predictor variables. The criterion variable, TRL, had a mean score of 3.10, which suggests that, on average, respondents reported a relatively high level of transformational leadership. Meanwhile, the eight predictor variables ranged from 1.75 to 3.67 on a five-point Likert scale. As presented in Table 3, additional descriptive data for the variables are provided. In relation to this, the study's problem statement was that it is not known whether and to what extent the TSC dimensions of Techno-overload (T-OVE), Techno-invasion (T-INV), Techno-complexity (T-COM), Techno-insecurity (T-INS), and Techno-uncertainty (T-UNC), as well as the TSI dimensions of Literacy Facilitation (LIF), Technical Support Provision (TSP), and Involvement Facilitation (INF), collectively and individually explain variation in TRL among PSBU academic administrators.

3.2. Multiple Linear Regression (MLR) Results of both Research Questions

To ensure the appropriateness of the regression analysis in answering the research questions, several key assumptions of multiple linear regression were first evaluated. These include normality, linearity, multicollinearity, and homoscedasticity. The results of these assumption tests are summarized in Table 4.

Table 4. Main Assumptions of Multiple Linear Regression (MLR)

Assumption	Purpose	Common Statistical Test	Acceptable Criteria
Linearity	Ensures a linear relationship between predictors and outcome	Scatterplot, Partial regression plot	The relationship appears approximately straight-line
Normality of residuals	Residuals (errors) should be normally distributed	Histogram, P-P Plot, Shapiro–Wilk test	$p > 0.05$ (normal distribution)
Homoscedasticity	Equal variance of residuals across predicted values	Scatterplot of residuals vs predicted values	Residuals evenly spread (no funnel shape)
Independence of errors	Residuals should not be correlated	Durbin–Watson statistic	1.5 – 2.5 acceptable
Multicollinearity	Predictors should not be highly correlated	VIF, Tolerance	VIF < 10 (preferably < 5); Tolerance > 0.10
Outliers / influential cases	Extreme values should not distort the model	Cook's Distance, Mahalanobis distance	Cook's Distance < 1
Sample size adequacy	Sufficient cases to ensure stable estimates	Rule of thumb	$N \geq 50 + 8m$ (m = predictors)

Prior to conducting multiple linear regression, the assumptions of linearity, normality of residuals, homoscedasticity, independence of errors, multicollinearity, and outliers were examined. Visual inspection of scatterplots indicated that the relationships were approximately linear and that the residuals were reasonably homoscedastic. Histogram and normal P–P plot inspection suggested that the residuals were approximately normally distributed. The Durbin–Watson statistics were 1.785 for the TSC model and 1.595 for the TSI model, indicating acceptable independence of errors. Multicollinearity was not a concern because all tolerance values were above 0.10 and all VIF values were below 5.00. In addition, Cook's distance values were below 1.00, indicating no influential outliers. Therefore, the assumptions for multiple linear regression were considered adequately met.

3.2.1. Results of the First Research Question

The first research question asked: "*To what extent do the TSC collectively and individually explain the variation in the PSBU academic administrator's level of TRL?*"

The first research question examined whether TSC collectively and individually predicted TRL.

Table 5. Model Summary of the TSC Regression Model

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Durbin-Watson
1	0.260[a]	0.069	0.069	0.41138	1.785

As shown in Table 5, the TSC predictors did not significantly explain variation in the PSBU administrators' level of TRL, $F(5, 117) = 1.83$, $p = 0.113$, $R^2 = 0.069$. In other words, the predictor variables explained 6.9% of the variance in the model, indicating a small effect size. Similarly, for research question 1, TSC jointly and TRL style produced the following F test, $F(5, 117) = 1.83$, $p = 0.112$, adjusted $R^2 = 0.069$. These findings show that the TSC variables explained only 6.9% of the variance in TRL style level. Nevertheless, it is well established that leaders who provide resources to their employees and followers experience less burnout and disengagement inside their organization [35]-[38]. Furthermore, when compared to the leadership dimensions of

transactional and laissez-faire leadership styles, the TRL style was found to be the most effective at dealing with technostress. However, there has been little research on technostress and transformative leadership in higher education academic administrators, as the majority of studies focus on students and teachers/faculty [9], [13].

Table 6. ANOVA for the TSC Regression Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.548	5	0.310	1.830	0.113
	Residual	21.323	118	0.169		
	Total	22.871	123			

As revealed in Table 6 above, the overall statistical significance of the model must also be examined. Generally, a p-value less than 0.05 implies a statistically significant outcome [23]-[37]. Based on this criterion, according to the ANOVA results from SPSS, the predictor variables T-UNC, T-INS, T-INV, T-COM, and T-OVE did not significantly predict the PSBU administrators' TRL style level ($F(5, 117) = 1.830$, $p = 0.113$, adjusted $R^2 = 0.069$). Therefore, the ANOVA table below demonstrates that technostress generators do not statistically significantly explain the variation in the PSBU administrator's level of TRL.

In this context, Nastjuk et al. [18], investigated how stress affects user role stress and individual productivity using sociotechnical theory and role theory, respectively. Accordingly, TSC classifies sources of technostress into five categories [8]. Furthermore, TSC identifies the elements that cause stress in the user and categorizes the stress [39]-[41]. Subsequently, each TSC category will be discussed in length in the paragraphs below. For instance, users of information technology who are concerned about not being able to keep up with changes or missing an update suffer technological uncertainty [16]. In particular, these upgrades include both hardware and software modifications [42]-[44]. Consequently, when people are confused about the ITs they utilize, they may experience technostress.

Table 7. Regression Coefficients for TSC Predictors

Model		Standardized Coefficients Beta (β)	Sig.	95.0% Confidence Interval for β	
				Lower Bound	Upper Bound
1	(Constant)		< 0.001	2.731	3.538
	T-OVE	0.054	0.685	-0.088	0.135
	T-INV	0.093	0.435	-0.058	0.132
	T-COM	-0.128	0.207	-0.184	0.041
	T-INS	-0.204	0.045	-0.288	-0.004
	T-UNC	0.104	0.278	-0.047	0.165

Table 7 displays the standardized beta for the TSC predictor variables. Each predictor variable in research question 1 was examined individually for statistical significance. Although the bulk of the null hypotheses were not rejected, the predictor variable T-INS had a p-value of 0.04, thus showing statistical significance. Specifically, T-INS had a negative influence ($\beta = -0.204$) on TRL, indicating that higher levels of techno-insecurity were associated with lower levels of transformational leadership

On the other hand, T-OVE, T-INV, T-COM, and T-UNC were not statistically significant predictor variables for the PSBU administrator's TRL level. As shown in Table 4, the statistical significance of each predictor variable is presented individually. The 95% confidence interval can also be used to assess statistical significance. In particular, when the slopes of the Lower and Upper Bound Confidence intervals intersect, the slope coefficient is not statistically significant [33]. In this case, all four predictor variables had *p* values greater than 0.05, and their 95% confidence intervals crossed zero.

Overall, the results for the first research question showed that TSC did not collectively predict TRL significantly, although techno-insecurity emerged as a significant negative individual predictor.

3.2.2 Results of the Second Research Question

The second research question asked: "*To what extent do the TSI collectively and individually explain the variation in the PSBU academic administrator's level of TRL?*"

The second research question examined whether TSI collectively and individually predicted TRL.

Table 8. Model Summary of the TSI Regression Model

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Durbin-Watson
1	0.132[a]	0.018	-0.006	0.4196	1.595

As shown in Table 8 above, the predictor variables for TSI did not statistically significantly explain the variation in a higher education academic administrator's level of TRL, F(3, 128) = 0.726, p = 0.538, adjusted R^2 = 0.018. The regression model yielded an R^2 of 0.018, indicating that the three TSI predictor variables together explained 6.9% of the variance in TRL style level, representing a very small effect size.

Similarly, for research question 2, examining TSI and transformational leadership (TRL) style, the multiple linear regression produced the following result: F (3, 128) = 0.726, p = 0.538, adjusted R^2 = 0.018. These findings indicate that the TSI variables accounted for only a very small proportion of the variance in TRL. Because the overall regression model was not statistically significant, TSI cannot be considered a significant predictor of TRL in this study. In other words, there is no evidence of a significant collective association between TSI and TRL level in this study. Although prior literature suggested that further research on TSI and TRL is needed, the present findings indicate that TSI did not emerge as a significant predictor of TRL style in this sample.

Table 9. ANOVA for the TSI Regression Model

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.384	5	0.129	0.725	0.537
	Residual	22.487	118	0.175		
	Total	22.872	123			

Table 9 reveals that the overall statistical significance of the model must also be examined. Generally, a p-value less than 0.05 implies a statistically significant outcome [23]. Based on this criterion, according to the ANOVA results from SPSS, the predictor variables of Involvement Facilitation (INF), Technical Support Provision (TSP), and Literacy Facilitation (LIF) do not statistically significantly predict a higher education academic administrator's TRL style level, F(3, 128) = 0.725, p = 0.537, adjusted R^2 = 0.018. Therefore, the ANOVA results indicate that TSI did not significantly explain variation in the PSBU administrators' level of TRL.

In this context, understanding how technostress might be blocked and perceived by employees benefits both the employee and the organization. Specifically, define TSI as organizational mechanisms that mitigate or prevent the impacts of the TSC [45]-[47]. Although TSI will differ based on the organization, this variation does not diminish its value. Accordingly, TSI will take on numerous forms depending on the circumstances and company culture. Furthermore, the distinction is significant since education level, IT use, and age all influence how successful the TSI is, thereby illustrating the impact of user perception on the positive TSI. For example, this may include shared knowledge practices, training, available documentation, and other IT-related awareness resources [48]-[50]. Consequently, users have reported feeling less stressed by technology when training, documentation, and awareness are provided through organizational channels.

Table 10. Regression Coefficients for TSI Predictors

	Model	Standardized Coefficients Beta (β)	Sig.	95.0% Confidence Interval for β	
				Lower Bound	Upper Bound
1	(Constant)		< 0.001	2.542	3.295
	INF	-0.059	0.609	-0.144	0.085
	TSP	0.132	0.161	-0.022	0.132
	LIF	0.054	0.617	-0.617	0.155

Table 10 shows the statistical significance of each predictor variable individually. In this regard, each predictor variable of research question 2 was examined separately to evaluate statistical significance. Based on the results, INF, TSP, and LIF were not found to be statistically significant predictors of the PSBU administrator's TRL level. Moreover, the 95% confidence interval can also be used to assess statistical significance. Specifically, when the slopes of the lower and upper confidence intervals intersect zero, the slope coefficient is not statistically significant [33]. In this scenario, not only do the three predictor variables have p-values more than 0.05, but also their 95% confidence intervals cross zero. Building upon these findings, the following section discusses the results in relation to existing literature, theoretical perspectives, and the broader context of technostress and leadership in higher education.

Overall, the findings of this study indicate that technostress creators (TSC) and technostress inhibitors (TSI) did not significantly predict transformational leadership (TRL) among academic administrators at Preah Sihamoniraja Buddhist University (PSBU). The regression analysis showed that TSC collectively explained only 6.9% of the variance in TRL, while TSI explained 1.8%, indicating a very small predictive effect. These results suggest that although technostress exists in technology-rich higher education environments, it may not be a dominant factor influencing leadership style among academic administrators. However, one important exception was identified, as techno-insecurity (T-INS) emerged as a significant negative predictor of TRL, indicating that concerns about job security related to technology may reduce leaders' transformational behaviors. This finding is

consistent with prior studies suggesting that leadership effectiveness may decline when individuals perceive threats to professional competence or job stability [35]–[38].

From a theoretical perspective, these findings can be interpreted through sociotechnical theory and role theory, which suggest that stress arises when individuals experience misalignment between technological demands and organizational roles [18]. Technostress creators, such as overload, uncertainty, and insecurity, represent key sources of strain in digital environments [8], [39]–[41]. In particular, techno-insecurity may undermine leaders' confidence in their technological competence, thereby weakening their ability to demonstrate transformational leadership behaviors such as inspiration, innovation, and vision, as emphasized in transformational leadership theory [16], [51], [52]. However, the overall non-significant results suggest that transformational leadership may be relatively resilient to technostress, supporting the argument that such leaders possess adaptive capabilities that enable them to cope effectively with technological challenges [13], [53], [54].

When compared with previous studies, the findings are partially consistent with earlier research indicating that transformational leadership plays a role in helping organizations cope with technological challenges [9], [13]. However, while prior studies have largely focused on employees, students, or faculty members, the present study extends this line of research to academic administrators, a group that has received relatively limited attention [55], [56]. In addition, previous literature has emphasized the importance of technostress inhibitors (TSI), such as training, technical support, and knowledge sharing, in reducing stress levels [45]–[50]. In contrast, this study found that TSI did not significantly predict transformational leadership, suggesting that leadership style may be influenced more strongly by individual characteristics, organizational culture, or institutional structures rather than by perceived technological support alone.

The novelty of this study lies in its integrated examination of technostress creators (TSC), technostress inhibitors (TSI), and transformational leadership (TRL) within the specific context of higher education academic administrators. Unlike most prior research that concentrates on students or faculty members [9], [13], this study highlights the leadership dimension of technostress in administrative roles. Furthermore, by simultaneously analyzing both stress-inducing (TSC) and stress-mitigating (TSI) factors, this research provides a more comprehensive understanding of how technological environments relate to leadership behavior in higher education settings.

These findings also carry several important implications. Theoretically, this study contributes to the literature by suggesting that transformational leadership may not be directly shaped by technostress factors, thereby extending existing discussions in technostress and leadership research [8], [16], [51]. Instead, the results imply that leadership effectiveness may depend more on internal competencies and adaptive capacities than on external technological stressors. Practically, the results highlight the importance of addressing techno-insecurity among academic administrators. Universities should consider implementing continuous digital training programs, strengthening technical support systems, and promoting knowledge-sharing practices to reduce uncertainty and enhance confidence in technology use [45]–[50]. Such efforts may help leaders maintain transformational leadership practices in increasingly digitalized environments.

Despite these contributions, this study has several limitations. First, the sample was limited to academic administrators from a single institution (PSBU), which may restrict the generalizability of the findings to other higher education contexts. Second, the use of self-reported data may introduce response bias, as participants may overestimate or underestimate their perceptions and behaviors. Third, the cross-sectional research design does not allow for causal inferences between technostress and leadership. Future research is recommended to include multiple institutions, apply longitudinal designs, and incorporate additional variables such as organizational culture, leadership experience, and digital competence to provide a more comprehensive understanding of the relationship between technostress and leadership.

4. CONCLUSION

In this study, the extent to which technostress creators (TSC) and technostress inhibitors (TSI) both collectively and individually predict the level of transformational leadership (TRL) in academic administrators at the Preah Sihamoniraja Buddhist University (PSBU) in Cambodia was investigated. In terms of results and conclusion, it can be stated that the role of TSC in explaining variation in TRL collectively was insignificant, as only 6.9% of the variance was explained, and the model was not statistically significant. In addition, the role of TSI in explaining variation in TRL collectively was insignificant, since only 1.8% of the variance was explained. Thus, in response to the two research questions, it can be stated that neither TSC nor TSI collectively was a significant predictor of transformational leadership among academic administrators at the PSBU. However, on the individual level, techno-insecurity (T-INS) was identified as a significant negative predictor of TRL. This means that higher levels of techno-insecurity were associated with lower levels of transformational leadership among academic administrators. In conclusion, this paper has contributed to the existing research on leadership and technostress in academia by illustrating that the connection between technostress and transformational leadership among academic administrators can be less direct and intricate than had been expected before. The results of the

study indicate that the formation of transformational leadership in higher education can be determined to a greater extent by personal qualities, institutional atmosphere, and organizational environment rather than by technostressors or technorelaxers. It is worth noting that the significant impact of techno-insecurity emphasizes the need for helping academic administrators to cope with changing technologies in order not to be impeded by their fear to lose relevance or job safety. As far as future research is concerned, it would be reasonable to conduct additional studies using larger samples recruited from universities in Cambodia or another country to enhance the representativeness of results. Furthermore, scholars can apply mixed methodology or a purely qualitative design to explore academic administrators' perceptions of technostress when they work as leaders. Moreover, future research should focus on studying alternative factors explaining the development of transformational leadership among academic administrators. Longitudinal research is also recommended to determine whether the relationship between technostress and leadership changes over time as digital transformation in higher education continues to expand.

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AUTHOR CONTRIBUTIONS

Conceptualization, Sarom Mok and Sereyrath Em; Methodology, Sarom Mok; Software, Bora Khath; Validation, Sarom Mok, Bora Khath, and Sereyrath Em; Formal Analysis, Sarom Mok; Investigation, Sarom Mok and Sothea Lim; Resources, Darath Khim; Data Curation, Sarom Mok; Writing – Original Draft Preparation, Sarom Mok; Writing – Review & Editing, Sereyrath Em, Bora Khath, and Saravuth Um; Visualization, Sothea Lim, Sokha Morn; Supervision, Sereyrath Em; Project Administration, Sarom Mok; Funding Acquisition, Sarom Mok.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all participants involved in this study. Prior to participation, each individual was provided with a clear and comprehensive explanation of the study's objectives, procedures, potential risks, and anticipated benefits. Participation was entirely voluntary, and all participants provided written informed consent before taking part in the research..

CONFLICTS OF INTEREST

The authors declare no conflict of interest. The authors have no personal circumstances or financial interests that could be perceived as influencing the representation or interpretation of the research results. Furthermore, the funding sponsors had no role in the selection of the research topic; the design of the study; the collection, analysis, or interpretation of data; the writing of the manuscript; or the decision to publish the results.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI)-assisted technologies were used in the preparation, analysis, or writing of this manuscript. All stages of the research process, including data collection, data analysis, interpretation of results, and manuscript preparation, were conducted entirely by the authors without the assistance of any AI-based tools.

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