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Technostress and Productivity: Evidence from Business Process Outsourcing (BPO) Workers

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Abstract

Technostress in Kenya's Business Process Outsourcing sector significantly reduced productivity, increased turnover, and posed mental health challenges. This study examined primary factors contributing to technostress among BPO workers and their influence on employee productivity. The study was anchored on Job Demands-Resources (JD-R) Model and Transactional Model of Stress and Coping. The Job Demands-Resources (JD-R) Model. The study employed sequential explanatory mixed-methods design. Using Krejcie and Morgan's formula, 369 participants were selected through stratified random sampling from 8,000-10,000 BPO employees across 14 Nairobi service providers, with 15-20 purposively selected for qualitative phase. SPSS version 28 analyzed quantitative data through descriptive statistics, correlation and regression. The study found primary technostress factors negatively correlated with productivity at r = -0.403 and explained 16.2 percent variance with coefficient B = -0.435. The study concludes that primary factors contributing to technostress significantly and negatively influence employee productivity in Kenya's BPO sector. Technology insecurity emerged as the most severe stressor, with employees expressing substantial concerns about job displacement due to automation and AI integration, followed closely by technology overload manifesting through overwhelming digital task volumes and constant notification streams. Technology complexity, invasion, and uncertainty demonstrated moderate prevalence, indicating that BPO employees experience multiple simultaneous technostressors creating cumulative strain affecting work performance. The study recommends that BPO organizations in Kenya should implement comprehensive technostress mitigation strategies addressing all five primary stressor dimensions simultaneously rather than isolated interventions targeting single factors. Organizations should prioritize addressing technology insecurity concerns by providing transparent communication about automation implementation plans, offering clear career development pathways demonstrating how AI enhances rather than replaces human roles, and establishing job security assurances coupled with reskilling programs preparing employees for evolving technological landscapes.

1. Introduction

Kenya's business process outsourcing (BPO) sector has grown rapidly due to Vision 2030 government initiatives and affordable broadband infrastructure (Ministry of Labour and Social Protection, 2024). The variety of services offered by Kenyan call centers like Call Center International, Techno-brain, C&R Group, Tele-Sky Limited, and Safaricom supports the growing BPO sector (Larsen et al., 2023). A youthful workforce and the establishment of both local and multinational companies have also contributed to this substantial growth (Zone, 2024). According to industry reports, the sector has seen a rapid annual growth rate of approximately 15%, with services ranging from customer support and data entry to more advanced functions like IT services and financial processing (KENIA, 2024). Kenya was projected to generate $254 million in revenue between 2023 and 2025, making it a major BPO hub in Africa (Pichette, 2023). The report predicts that Eastern Africa's BPO market will reach $1.62 billion by 2024 and grow 8.63% from 2024 to 2029.

With over 44% of workers in particular regions experiencing flexible work arrangements and facing digital overload, the importance of addressing technostress is heightened by its economic and psychological costs, which are estimated to significantly affect global productivity (Sharma & Gupta, 2023). This rapid growth underscores the sector's potential to contribute to the country's economic development. However, challenges such as technostress a form of stress experienced due to the demands of using and adapting to technology—pose significant risks to employee well-being and productivity. Brod (1982), coined the term "technostress" to describe the negative psychological and physiological effects of technology. Tarafdar et al. (2019) examined technostress types that affect worker productivity. Techno-invasion, where constant connectivity blurs work-life boundaries; techno-overload, where ICT demands force employees to work longer and faster; and techno-complexity, where users struggle to use complex ICT systems : Arenas et al. (2023), Borle et al. (2021), V. Kumar et al. (2022), Nisafani et al. (2020) , and Sasidharan (2022) , have shown how important technostress mitigation is for worker productivity in various industries. Technostress is now considered a global phenomenon that includes technology stress and cognitive overload (Bondanini et al., 2020).

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If not addressed, technostress significantly impacts organizational performance, increases employee turnover, and reduces worker productivity (Bondanini et al., 2020). Zhao et al. (2024), found that technostress causes burnout, depression, and concentration issues in the work place. Other studies have shown its negative effects on career performance (Tarafdar et al., 2024a), lower engagement (van der Merwe & Armitage, 2019), the intrusion of technology into personal life has resulted in higher rates of conflict between work and family (Z. Wang et al., 2023).

The causes of this ever growing concern and how they affect stress levels in different employee demographics and industries, especially in developing countries, are poorly studied (Dutta et al., (2024b). Several technostress scales have been developed to assess context-specific techno-stress, including the Technostress Creators and Inhibitors Scale (Tarafdar et al., 2007, 2019) , Technostress Questionnaire (Ragu-Nathan et al., 2008) and Work-Related Technostress Questionnaire (WRT-Q) (Porcari et al., 2023) . Tech-overload, techno-complexity, and coping mechanisms stress scales measure worker productivity, job satisfaction, and performance. A sample of Italian banking workers used the (WRT-Q) technostress, which was highly reliable to measure stress in the banking sector (Porcari et al., 2023).

Jimy et al. (2023) conducted a cross-sectional quantitative analysis of 141 employees at a Sarawak, Malaysia, telecommunications firm to examine the effects of five main technostress creators—techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty—on employee well-being. The results showed that techno-overload and techno-insecurity were the biggest stressors for employees. The study stressed the need for technostress treatments for technology-oriented workers. Another Indian BPO study found that workload, night shifts, and performance targets stress workers (Padma et al., 2015).

While studies from developing countries like India, Malaysia and the Philippines highlight similar challenges, limited research has been done on technostress in Kenya's BPO industry, which emphasizes the need to investigate mitigation techniques, especially in contexts which relies a lot on technology. Although insightful, majority of existing studies' have relied on cross-sectional studies to examine short-term perceptions and impacts hindering their capacity to evaluate changes over time or document the long-term effects of interventions (X. Wang et al., 2020).

User-centered artificial intelligence designs are widely known essential techniques for mitigating technostress and enhancing productivity in this domain (Lee et al., 2021). A Brazilian bank study found that integrating AI with IBM's Watson reduced technostress by automating repetitive tasks, speeding up service, and freeing up human agents to solve harder problems. By lowering cognitive load, this change helped employees feel less stressed (I. M. De Andrade et al., 2022) . By developing user-friendly systems that are suited to agents' requirements, user-centered design (UCD) helps call centers reduce technostress. According to (Kwon et al., 2021a), user-centered design principles, when adopted, streamline interfaces, automate processes, and offer customization by incorporating users into the design process. This promotes a healthier work environment, increases employee well-being, expedites workflows, and improves usability.

While certain call centers in Kenya have yet to embrace AI-driven tools for management, majority have fully integrated AI-powered chatbots, automated workflows, and real-time performance monitoring systems (Kleibert et al., 2020). These advancements have the potential to either exacerbate or alleviate technostress. Organizations can successfully reduce technostress by incorporating AI algorithms into designing intuitive or adaptable call center systems. In addition to automating repetitive tasks and streamlining operations, AI algorithms, when integrated into interface design, help agents deliver better customer service, which raises overall productivity, lowers burnout, and improves job satisfaction (Zhen et al., 2021). In call centers, an AI-driven, user-centered design approach produces a more efficient and supportive working environment that promotes a more sustainable and healthy work culture.

Numerous other studies have demonstrated that demographic factors, transformational leadership, ongoing training in emerging technologies, management policies, work-life balance, and a supportive work environment are also essential in minimizing technostress (J. M. Andrade et al., 2023; Pham Thi & Duong, 2024; Tzu et al., 2016; Z. Wang et al., 2023). These organizational factors boost employee adaptability, mitigate stressors, and cultivate a digitally inclusive work environment, hence enhancing productivity and well-being in digital workplaces.

Task-Technology Fit (Goodhue & Thompson, 1995), Person-Environment Fit (Edwards, 2008b), Job Demands-Resources (Bakker & Demerouti, 2007), Transactional Stress and Coping (Lazarus & Folkman, 1987), and User Centered Design (Norman & Draper, 1986) theories guide this study to reduce technostress in Kenya's BPO sector. This research addressed these gaps by examining the primary factors contributing to technostress among BPO workers. By emphasizing practical and implementable solutions, the study provided actionable guidance for enhancing task performance, strengthening employee well-being, and supporting sustainable growth in Kenya's expanding BPO sector. The main objective of the study is to examine the primary factors contributing to technostress among BPO workers and their influence on employee productivity.

2 Literature Review

2.1 Theoretical Foundations

The study was anchored on Job Demands-Resources (JD-R) Model and Transactional Model of Stress and Coping. The Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2007) provides the most directly relevant theoretical lens for examining primary technostress factors among BPO workers and their influence on productivity. The model distinguishes between job demands, which are physical, psychological, social, or organizational aspects requiring sustained effort, and job resources, which buffer against the negative effects of those demands. When applied to Kenya's BPO sector, the JD-R model identifies specific technostress triggers including poorly designed AI interfaces, constant performance monitoring, overwhelming data volumes, and complex digital workflows that collectively impair employee health and reduce productivity. Scholze et al. (2024) reinforced this by demonstrating how digital job demands in AI-intensive environments generate significant technostress, making the model particularly suited to understanding productivity losses among BPO employees.

The Transactional Model of Stress and Coping (Lazarus & Folkman, 1987) further explains how BPO workers cognitively process and respond to primary technostress factors. The model operates through primary appraisal, where employees evaluate whether a technological demand constitutes a threat, and secondary appraisal, where they assess their available coping resources. When employees perceive techno-stressors such as techno-overload, techno-complexity, and techno-invasion as exceeding their coping capacity, stress escalates and productivity deteriorates. Saleem et al. (2023) demonstrated comparable outcomes among university educators, where techno-complexity and techno-overload significantly reduced work quality and performance, suggesting analogous effects in high-pressure BPO environments where rapid technology adoption is constant.

Together, these two theories form a complementary framework for understanding how primary technostress factors translate into measurable productivity losses among BPO workers. The JD-R model identifies and categorizes the structural workplace demands that generate technostress, while the Transactional Model explains the psychological mechanisms through which employees perceive and respond to those demands. Their integration allows the study to examine both the organizational origins of technostress and the individual-level processes that determine whether such stressors ultimately diminish or

sustain employee productivity. This dual-theory approach justifies the study's regression model, specified as $Y = \beta_0 + \beta_1$ (Primary Technostress Factors) + ε, which statistically tests the directional influence of primary technostress factors on employee productivity outcomes.

2.2 Review of Related Work

Technostress among BPO workers is fundamentally rooted in the inability to cope with workplace technology demands, a condition that directly diminishes employee productivity and organizational effectiveness (Pullins et al., 2020). Tarafdar et al. (2007) identified five primary technostress creators — techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty — that collectively increase cognitive and emotional workload, leading to burnout, job dissatisfaction, and reduced performance. In Kenya's BPO sector specifically, these stressors are compounded by poor infrastructure, shortage of skilled workers, unreliable local system support, and limited incentives, all of which intensify the negative influence of technology-induced stress on worker output. These foundational findings establish that primary technostress factors do not operate in isolation but interact with contextual workplace conditions to produce measurable productivity losses among BPO employees.

Techno-overload emerges as one of the most pervasive primary factors contributing to technostress among BPO workers, characterized by pressure to manage heavy workloads generated by ICT systems. Camacho et al. (2022) demonstrated that work overload and work-home conflict were the two strongest techno-stressors, directly reducing employees' perceived job performance and satisfaction with their work arrangements. In BPO environments, employees are compelled to multitask across multiple platforms simultaneously to meet performance targets, creating unsustainable cognitive demands. Padma et al. (2015) corroborated these findings in a study of Indian IT and BPO workers, revealing that workload, night shifts, and performance targets were primary stress drivers, with stress scores directly correlating with health deterioration including depression, anxiety, and hypertension, all of which further suppressed productivity outcomes.

Techno-complexity represents another critical primary factor, particularly affecting BPO workers with low technological self-efficacy or insufficient technical training. Salazar-Concha et al. (2022) established that workers overwhelmed by elaborate systems requiring continuous learning experienced significantly elevated stress levels that translated into diminished work quality and efficiency. Bondanini et al. (2020) reinforced this finding by demonstrating that inadequate training in new technologies created anxiety and unpreparedness among BPO employees, directly impairing their capacity to handle complex systems effectively. In the Kenyan context, this challenge is intensified by infrastructure deficiencies such as unstable internet connectivity, which compounds system-related frustration and drives further inefficiency among workers already struggling to adapt to rapidly evolving digital tools and platforms.

Techno-invasion constitutes a third major primary factor, blurring the boundaries between professional and personal life by requiring employees to remain constantly connected beyond regular working hours. Wang et al. (2024) identified technological intrusion alongside overload, complexity, and insecurity as key stressors that harm mental health, job satisfaction, and productivity, ultimately causing absenteeism and high employee turnover in technology-intensive workplaces. Akif et al. (2022), studying call center workers in Turkey, found that 45.8% of employees were at risk for mental health problems directly attributable to excessive workload, rapid technology changes, and the constant connectivity demands of their roles. These findings are particularly relevant to Kenya's BPO sector, where international client service level agreements require employees to maintain perpetual availability, significantly increasing stress-related burdens and reducing sustained productive capacity.

Beyond individual technostress dimensions, the cumulative influence of these primary factors on employee productivity has been consistently demonstrated across multiple research contexts. Nastjuk et al. (2024), synthesizing data from 102 articles, confirmed that technostress creators produce significant negative impacts on both psychological and behavioral outcomes, with productivity emerging as one of the most consistently affected performance indicators. Sanjeeva Kumar (2024) was similarly found through a comprehensive systematic literature review spanning 2007 to 2023 that prolonged exposure to technostress leads to health consequences including headaches, sleep disturbances, and fatigue, all of which progressively erode an employee's productive capacity over time. In the BPO sector specifically, where performance metrics are rigidly monitored and efficiency is paramount, these cumulative health and psychological effects translate directly into measurable declines in output quality and quantity.

In the Kenyan context, local studies have begun to illuminate how these primary technostress factors manifest distinctly within the country's workforce. Ogada Hongo et al. (2019) identified exhaustion, headaches, anxiety, and social isolation as prominent technostress symptoms among Kenyan technology users, attributing these to rapid technological advancements and inadequate ergonomic workplace support. Oboko (2016) further confirmed that techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty collectively produced anxiety, irritability, and diminished productivity among Kenyan workers, underscoring the urgent necessity for sector-specific mitigation strategies. However, both studies focused on academic and general youth populations rather than BPO environments, creating a significant research gap that the present study addresses by examining how these same primary technostress factors operate within Kenya's high-pressure, technology-driven BPO sector and quantifying their specific influence on employee productivity outcomes.

2.3 Conceptual Framework

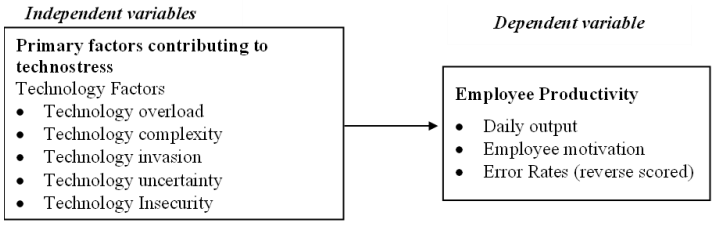

Figure 1: Conceptual Framework

3 Research Methodology

The study was philosophically grounded in interpretivism and pragmatism, which together provided a balanced foundation for examining primary technostress factors among BPO workers in Kenya. The interpretivist stance enabled an in-depth exploration of how employees personally experienced

stressors such as workload pressure, digital tool complexity, and constant connectivity demands, while the pragmatist orientation ensured findings remained practically applicable to real workplace conditions (Goldkuhl, 2012; Ramanadhan et al., 2021). This dual philosophical approach aligned with Bondanini et al. (2020), who argued that understanding technostress in work settings requires both quantitative rigor and qualitative depth. A sequential explanatory mixed-methods design was adopted, beginning with a quantitative cross-sectional phase that captured technostress levels, AI interaction experiences, and productivity outcomes across diverse employee groups, followed by qualitative interviews that provided richer contextual explanations of observed patterns.

The study drew its target population from approximately 9,000 BPO employees across 14 major Nairobi firms. Participants regularly interacted with technostress-inducing digital environments, including CRM systems like Salesforce and Zendesk, AI-powered chatbots, automated call routing, predictive dialers, and real-time performance monitoring platforms. These technological demands were consistently identified as primary drivers of technostress across the BPO sector (Ahmad et al., 2021). Stratified random sampling ensured representation across job roles, experience levels, service departments, and organizational sizes, yielding a final sample of 369 respondents calculated using Krejcie and Morgan's (1970) formula at a 95% confidence level with a 5% margin of error.

Data were collected using a structured questionnaire adapted from the validated Technostress Creators Scale (Tarafdar et al., 2007, 2019) and the Work-Related Technostress Questionnaire (Porcari et al., 2023), which specifically measured technostress dimensions including techno-overload, techno-complexity, and techno-invasion. Qualitative semi-structured interviews with 15–20 purposively selected participants further explored how these stressors manifested in daily work experiences. Analytically, SPSS version 28 was used to run descriptive statistics and inferential tests, with Model 1 specified as $Y = \beta_0 + \beta_1$ (Primary Technostress Factors) + ε to quantify the predictive relationship between primary technostress factors and employee productivity. A p-value threshold of 0.05 governed hypothesis testing, enabling statistically grounded conclusions about how technostress factors influenced productivity outcomes among Nairobi's BPO workforce.

4 Results and Findings

4.1 Response Rate

The study achieved a response rate of 94.21 percent, with 309 completed questionnaires collected from the target sample of 328 participants. The initial sample size was 369 respondents, calculated using Krejcie and Morgan's formula based on the accessible population of 9,000 BPO employees across Nairobi. However, Flexi Personnel, which comprised 41 respondents, was excluded from the main data collection because this organization had been utilized during the pilot study. This exclusion reduced the final sample size to 328 participants. According to Mugenda and Mugenda (2003), a response rate of 50 percent is adequate for analysis, 60 percent is good, and 70 percent and above is excellent. Babbie (2016) indicates that response rates above 70 percent are acceptable for generalizing findings. The achieved response rate of 94.21 percent exceeded these thresholds, demonstrating strong participant engagement and ensuring adequate statistical power for subsequent analyses.

4.2 Qualitative Findings

Participants identified multiple primary sources of technostress among BPO workers in Kenya, with constant digital connectivity emerging as a pervasive stressor creating an always-on culture that erodes work-life boundaries and drives exhaustion. Respondents emphasized that expectations remain available across multiple platforms and devices simultaneously prevent psychological detachment from work demands, contributing to chronic fatigue and burnout. The rapid introduction of new software tools and frequent system updates without adequate training time surfaced as another critical stressor, with employees expressing feelings of overwhelm when required to master unfamiliar technologies quickly while maintaining performance standards. Information overload was consistently mentioned, with agents describing bombardment by continuous notification streams, dashboard alerts, and messages that fragment attention and disrupt cognitive flow necessary for quality customer interactions. Participants noted that complex and unintuitive technology systems with poorly designed interfaces make routine tasks unnecessarily difficult, diminishing confidence and creating frustration that accumulates throughout workdays. The lack of adequate digital training emerged as a significant concern, with many workers feeling abandoned to figure out evolving technologies independently without structured guidance or support mechanisms.

Additional technostress sources included excessive monitoring through automated performance tracking systems that make employees feel scrutinized and anxious about meeting metrics, creating pressure that undermines autonomous work engagement. The constant pressure to meet high performance targets amplified by real-time analytics was described as particularly stressful because workers perceive little control over work pace and feel unable to manage competing demands effectively. Fear of job insecurity due to increasing automation and AI integration created ongoing anxiety about employment prospects, with workers expressing concern that technological advancement threatens their roles rather than supporting their work. Frequent technical disruptions, slow system performance, and unreliable legacy platforms added daily frustrations that compound stress levels and reduce productivity.

4.3 Correlation Analysis

Correlation analysis was conducted to examine the association between independent variables and the dependent variable, employee productivity. The correlation matrix presented in Table 1 displays correlation coefficients and their corresponding significance levels for all study variables. Correlation values range from -1 to +1, where values closer to -1 indicate strong negative relationships, values closer to +1 indicate strong positive relationships, and values near zero suggest weak or no linear relationships. Statistical significance was determined at the 0.05 level, with asterisks denoting significant correlations.

Table 1: Correlation Matrix

		Employee Productivity	Primary Factors Contributing to Technostress
Employee Productivity	Pearson Correlation		
	Sig. (2-tailed)		
Primary Factors Contributing to Technostress	Pearson Correlation	-.403**	1.000
	Sig. (2-tailed)	0.000	

The study found that primary factors contributing to technostress were negatively and significantly correlated with employee productivity (r = -.403, p = 0.000). This reveals that as technostress factors such as technology overload, complexity, invasion, uncertainty, and insecurity increase, employee productivity declines correspondingly. The moderate negative correlation indicates that employees experiencing higher levels of technology-related demands, system complexity, work-life boundary erosion, skill obsolescence fears, and job displacement concerns demonstrate diminished work performance. This finding aligns with theoretical expectations that excessive technological pressures impair employee functioning.

4.4 Primary Factors Contributing to Technostress

The study examined primary factors contributing to technostress among BPO workers in Kenya. This section includes descriptive analysis, factor loading analysis, and regression analysis.

Descriptive Analysis

This section presents descriptive statistics for the five dimensions of primary technostress factors measured on a five-point Likert scale. The results displayed in Table 2 include frequencies, percentages, means, and standard deviations for each statement item measuring technology overload, technology complexity, technology invasion, technology uncertainty, and technology insecurity. Higher mean scores indicate stronger agreement with technostress experiences, while standard deviations reflect response variability across participants.

Table 2: Descriptive Statistics for Primary Factors Contributing to Technostress

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Technology Overload							
I receive more digital tasks than I can handle within my work hours.	1.90%	2.90%	4.50%	69.30%	21.40%	4.05	0.74
Constant notifications (emails/chats/alerts) make it hard to focus on my work.	11.00%	10.00%	4.20%	64.10%	10.70%	3.53	1.15
The volume of information I need to process through technology is overwhelming.	11.00%	6.10%	10.40%	59.20%	13.30%	3.58	1.14
I am forced by technology to work much faster than is comfortable for me.	10.00%	10.40%	10.00%	50.20%	19.40%	3.59	1.20
Technology Complexity							
Our work systems are unnecessarily complicated.	8.70%	10.70%	16.50%	42.40%	21.70%	3.58	1.19
I need frequent help to use required software/tools effectively.	12.00%	11.70%	15.50%	36.20%	24.60%	3.50	1.30
I find new technologies complex and difficult to understand.	10.00%	14.20%	20.40%	33.00%	22.30%	3.43	1.26
I spend too much time learning about new technology features.	11.70%	9.40%	19.40%	35.60%	23.90%	3.51	1.27
Technology Invasion							
I feel pressured to respond to work messages after working hours.	11.70%	14.20%	13.60%	36.60%	23.90%	3.47	1.31
Workplace technology blurs my work-life boundaries.	7.10%	17.50%	16.80%	35.30%	23.30%	3.50	1.22
I am in touch with my work even during my vacation due to technology.	12.90%	15.20%	15.90%	35.30%	20.70%	3.36	1.32
I feel my personal life is being invaded by work technology.	13.90%	14.90%	15.90%	37.50%	17.80%	3.30	1.31
Technology Uncertainty							
Frequent software updates disrupt my workflow.	8.10%	19.40%	15.90%	40.80%	15.90%	3.37	1.20
I worry my current digital skills will become obsolete.	12.30%	12.90%	15.20%	39.20%	20.40%	3.42	1.29
There are constant changes in computer software in our organization.	10.70%	15.50%	16.20%	44.00%	13.60%	3.34	1.21
I feel uncertain about whether the systems I use will be replaced soon.	11.30%	14.90%	15.20%	38.50%	20.10%	3.41	1.28
Technology Insecurity							
I fear losing my job due to automation.	7.80%	12.90%	15.50%	40.80%	23.00%	3.58	1.20
I worry that AI will replace my role in the organization.	8.70%	10.40%	15.20%	43.70%	22.00%	3.60	1.19
I feel threatened by colleagues who have better technology skills than me.	6.50%	9.40%	15.20%	41.10%	27.80%	3.74	1.15
New technologies make me feel that my job is at risk.	11.30%	8.10%	12.00%	30.70%	37.90%	3.76	1.34
Average						**3.53**	**1.21**

Technology overload demonstrated high stress levels among BPO employees. The statement on receiving more digital tasks than can be handled within work hours recorded the highest mean of 4.05, with 90.7 percent (69.30+21.40) of respondents agreeing that excessive task volume characterizes their work experience. Only 4.80 percent (1.90+2.90) disagreed with this statement, while 4.50 percent remained neutral. Being forced by technology to work faster than comfortably showed a mean of 3.59, with 69.6 percent (50.20+19.40) agreeing and 20.4 percent (10.00+10.40) disagreeing. The volume of information needing processing through technology being overwhelming recorded a mean of 3.58, with 72.5 percent (59.20+13.30) expressing agreement and 17.1 percent (11.00+6.10) disagreeing. Constant notifications making it hard to focus recorded a mean of 3.53, with 74.8 percent (64.10+10.70) agreeing and 21.0 percent (11.00+10.00) disagreeing.

Technology complexity presented notable stress levels across all measurement items. The statement on work systems being unnecessarily complicated recorded a mean of 3.58, with 64.1 percent (42.40+21.70) of respondents agreeing that their workplace systems are overly difficult to navigate, while 19.4 percent (8.70+10.70) disagreed and 16.50 percent remained neutral. Spending too much time learning new technology features showed a mean of 3.51, with 59.5 percent (35.60+23.90) agreeing and 21.1 percent (11.70+9.40) disagreeing. Needing frequent help to use required software or tools effectively showed a mean of 3.50, with 60.8 percent (36.20+24.60) agreeing and 23.7 percent (12.00+11.70) disagreeing. Finding new technologies complex and difficult to understand recorded the lowest mean of 3.43, with 55.3 percent (33.00+22.30) expressing agreement and 24.2 percent (10.00+14.20)

disagreeing.

Technology invasion revealed moderate prevalence across four measurement items. The statement on workplace technology blurring work-life boundaries recorded the highest mean of 3.50, with 58.6 percent (35.30+23.30) of respondents agreeing that technology erodes separation between professional and personal spheres, while 24.6 percent (7.10+17.50) disagreed and 16.80 percent remained neutral. Feeling pressured to respond to work messages after working hours showed a mean of 3.47, with 60.5 percent (36.60+23.90) agreeing and 25.9 percent (11.70+14.20) disagreeing. Being in touch with work even during vacation due to technology recorded a mean of 3.36, with 56.0 percent (35.30+20.70) agreeing and 28.1 percent (12.90+15.20) disagreeing. Feeling that personal life is being invaded by work technology showed the lowest mean of 3.30, with 55.3 percent (37.50+17.80) agreeing and 28.8 percent (13.90+14.90) disagreeing.

Technology uncertainty displayed moderate stress levels across all four items. The statement on worrying that current digital skills will become obsolete recorded the highest mean of 3.42, with 59.6 percent (39.20+20.40) of respondents agreeing and 25.2 percent (12.30+12.90) disagreeing. Feeling uncertain about whether systems in use will be replaced soon showed a mean of 3.41, with 58.6 percent (38.50+20.10) agreeing and 26.2 percent (11.30+14.90) disagreeing. Frequent software updates disrupting workflow showed a mean of 3.37, with 56.7 percent (40.80+15.90) agreeing and 27.5 percent (8.10+19.40) disagreeing. Constant changes in computer software in the organization recorded the lowest mean of 3.34, with 57.6 percent (44.00+13.60) agreeing and 26.2 percent (10.70+15.50) disagreeing.

Technology insecurity emerged as a significant stressor across all measurement items. The statement on new technologies making employees feel that their jobs are at risk recorded the highest mean of 3.76, with 68.6 percent (30.70+37.90) of respondents agreeing that technological advancement threatens employment security, while only 19.4 percent (11.30+8.10) disagreed and 12.00 percent remained neutral. Feeling threatened by colleagues who have better technology skills showed a mean of 3.74, with 68.9 percent (41.10+27.80) agreeing and 15.9 percent (6.50+9.40) disagreeing. Worrying that AI will replace roles in the organization recorded a mean of 3.60, with 65.7 percent (43.70+22.00) agreeing and 19.1 percent (8.70+10.40) disagreeing. Fearing job loss due to automation showed a mean of 3.58, with 63.8 percent (40.80+23.00) agreeing and 20.7 percent (7.80+12.90) disagreeing.

Factor Loading Analysis for Primary Factors Contributing to Technostress

Factor analysis was conducted on the statements for each variable contributing to technostress. This was done by subjecting the statements to dimension reduction in SPSS, where any sub variable with an eigenvalue less than 0.4 is dropped. The results are presented in Table 4.3.

Table 3: Factor Analysis for Primary Factors Contributing to Technostress

Statements	Factor Loadings
I receive more digital tasks than I can handle within my work hours.	0.800
Constant notifications (emails/chats/alerts) make it hard to focus on my work.	0.831
The volume of information I need to process through technology is overwhelming.	0.890
I am forced by technology to work much faster than is comfortable for me.	0.755
Our work systems are unnecessarily complicated.	0.667
I need frequent help to use required software/tools effectively.	0.634
I find new technologies complex and difficult to understand.	0.641
I spend too much time learning new technology features.	0.686
I feel pressured to respond to work messages after working hours.	0.747
Workplace technology blurs my work-life boundaries.	0.770
I am in touch with my work even during my vacation due to technology.	0.608
I feel my personal life is being invaded by work technology.	0.752
Frequent software updates disrupt my workflow.	0.663
I worry my current digital skills will become obsolete.	0.781
There are constant changes in computer software in our organization.	0.698
I feel uncertain about whether the systems I use will be replaced soon.	0.621
I fear losing my job due to automation.	0.780
I worry that AI will replace my role in the organization.	0.738
I feel threatened by colleagues who have better technology skills than me.	0.771
New technologies make me feel that my job is at risk.	0.730

The results in Table 3 show that all statements under technology factors had eigenvalues greater than 0.4, indicating strong construct validity. The highest factor loading was for the volume of information needing processing through technology being overwhelming at 0.890, strongly representing technology overload. Constant notifications making it hard to focus recorded 0.831, while receiving more digital tasks than can be handled showed 0.800, both demonstrating strong loadings for overload dimensions. Being forced by technology to work faster than comfortable recorded 0.755. Items related to technology complexity showed adequate loadings, with work systems being unnecessarily complicated recording 0.667, spending too much time learning new technology features showing 0.686, finding new technologies complex and difficult to understand at 0.641, and needing frequent help to use required software or tools effectively recording 0.634. All complexity items exceeded the minimum threshold, confirming their contribution to measuring this dimension.

Technology invasion was adequately captured through multiple measurement items. Workplace technology blurring work-life boundaries recorded a strong loading of 0.770, while feeling that personal life is being invaded by work technology showed 0.752. Feeling pressured to respond to work messages after working hours recorded 0.747, and being in touch with work even during vacation due to technology showed 0.608. All invasion items demonstrated satisfactory factor loadings above the 0.4 threshold, confirming their relevance in measuring how workplace technology penetrates personal spheres. Technology uncertainty was reflected through worrying that current digital skills will become obsolete at 0.781, constant changes in computer software in the organization at 0.698, frequent software updates disrupting workflow at 0.663, and feeling uncertain about whether systems in use will be replaced soon at 0.621. These loadings confirmed that uncertainty items effectively captured employee concerns about technological unpredictability and skill obsolescence.

Technology insecurity emerged through strong factor loadings across all measurement items. Fearing job loss due to automation recorded 0.780, feeling threatened by colleagues who have better technology skills showed 0.771, worrying that AI will replace roles in the organization recorded 0.738, and new technologies making employees feel that jobs are at risk showed 0.730. All insecurity items demonstrated factor loadings substantially above the minimum threshold, confirming their effectiveness in measuring employment security concerns related to technological advancement and automation. The

consistently high loadings across all insecurity items indicated that this dimension was particularly salient for BPO employees, reflecting widespread anxiety about job displacement and skill-based competition. These strong psychometric properties validated the inclusion of technology insecurity as a critical component of the technostress measurement framework. Therefore, all statements were retained for final data collection.

Regression Analysis

Regression analysis was conducted to examine the relationship between primary factors contributing to technostress and employee productivity. Simple linear regression was employed because the analysis involved one independent variable predicting one dependent variable. The regression model assessed how well primary technostress factors explain variance in employee productivity, the strength of this relationship, and the statistical significance of the predictive relationship. The analysis generated three key output tables: model summary showing explained variance, analysis of variance testing model significance, and coefficients indicating the direction and magnitude of the relationship. These results address the first research objective examining how primary technostress factors influence employee productivity in Kenya's BPO sector.

Table 4: Regression Analysis of Primary Factors Contributing to Technostress on Employee Productivity

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.403a	0.162	0.159	0.222321

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.935	1	2.935	59.383	.000b
	Residual	15.174	307	0.049		
	Total	18.109	308			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.596	0.220		25.413	0.000
	Primary Factors Contributing to Technostress	-0.435	0.057	-0.403	-7.706	0.000

a Dependent Variable: Employee Productivity
b Predictors: (Constant), Primary Factors Contributing to Technostress

The model summary results show that primary factors contributing to technostress explained 16.2 percent of the variance in employee productivity, as indicated by the R Square value of 0.162. These results confirm that primary technostress factors constitute an important predictor of productivity outcomes, though other variables not included in this model also contribute to productivity variations. The analysis of variance results demonstrate that the regression model was statistically significant, with $F(1, 307) = 59.383$ and $p = 0.000$. This significance value below 0.05 indicates that primary factors contributing to technostress significantly predict employee productivity, and the observed relationship did not occur by chance.

The coefficients table reveals that primary factors contributing to technostress had a significant negative effect on employee productivity, with a coefficient B of -0.435 and significance value $p = 0.000$. This coefficient indicates that for every one-unit increase in primary technostress factors, employee productivity decreases by 0.435 units, holding other factors constant. The negative relationship confirms that higher levels of technology overload, complexity, invasion, uncertainty, and insecurity are associated with reduced productivity performance. The standardized beta coefficient of -0.403 allows comparison of effect sizes across different scales, confirming a moderate negative impact. The t-statistic of -7.706 with $p = 0.000$ demonstrates that this relationship is statistically significant, providing strong evidence against the null hypothesis of no effect. The constant term of 5.596 represents the expected productivity level when technostress factors are zero. These findings support the hypothesis that primary technostress factors significantly influence employee productivity in Kenya's BPO sector, emphasizing the need for technostress mitigation interventions.

5 Conclusion and Recommendations

5.1 Conclusion

The study concludes that primary factors contributing to technostress significantly and negatively influence employee productivity in Kenya's BPO sector. Technology insecurity emerged as the most severe stressor, with employees expressing substantial concerns about job displacement due to automation and AI integration, followed closely by technology overload manifesting through overwhelming digital task volumes and constant notification streams. Technology complexity, invasion, and uncertainty demonstrated moderate prevalence, indicating that BPO employees experience multiple simultaneous technostressors creating cumulative strain affecting work performance.

The negative correlation and meaningful variance explanation confirm that technostress creators constitute important productivity inhibitors requiring organizational attention. Qualitative insights revealed that constant connectivity expectations, rapid technology changes without adequate training, information overload, complex systems, inadequate digital skill development, excessive monitoring, and automation anxiety collectively undermine employee capacity to perform effectively. The prominence of job insecurity concerns in Kenya's BPO workforce suggests unique contextual factors in developing economy contexts where employment alternatives remain limited and social safety nets prove inadequate, distinguishing this population from workers in developed nations with stronger labor protections and more robust welfare systems.

5.2 Recommendations

The study recommends that BPO organizations in Kenya should implement comprehensive technostress mitigation strategies addressing all five primary stressor dimensions simultaneously rather than isolated interventions targeting single factors. Organizations should prioritize addressing technology insecurity concerns by providing transparent communication about automation implementation plans, offering clear career development pathways

demonstrating how AI enhances rather than replaces human roles, and establishing job security assurances coupled with reskilling programs preparing employees for evolving technological landscapes. Management should reduce technology overload by implementing workload monitoring systems identifying unsustainable task volumes, establishing realistic performance expectations accounting for technology limitations, and creating policies limiting after-hours digital connectivity protecting work-life boundaries. Organizations should address technology complexity by investing in intuitive system design, providing comprehensive onboarding programs for new technologies, and establishing readily accessible technical support reducing navigation difficulties.

BPO firms should mitigate technology invasion by establishing clear boundaries around after-hours connectivity expectations, implementing communication policies respecting personal time, and training managers to model healthy technology boundaries. Organizations should reduce technology uncertainty by providing advance notice of system changes, involving employees in technology transition planning, and offering continuous learning opportunities building confidence in adaptation capabilities, thereby creating work environments where technology supports rather than undermines employee effectiveness and well-being.

References

Akif, M., Toker, S., & Güler, N. (2022). Archives of Environmental & Occupational Health General mental state and quality of working life of call center employees. Archives of Environmental & Occupational Health, 77(8), 628–635. https://doi.org/10.1080/19338244.2021.1986462

Andrade, I. M. De, & Tumelero, C. (2022). Increasing customer service efficiency through artificial intelligence chatbot. Revista de Gestao, 29(3), 238–251. https://doi.org/10.1108/REGE-07-2021-0120

Andrade, J. M., Plazas, E. R., Ramírez, J. C., & Castro, D. B. (2023). Technostress, transformational leadership, and academic performance of university students in South Colombia. Problems and Perspectives in Management, 21(4), 467–482. https://doi.org/10.21511/ppm.21(4).2023.36

Arenas, A., Sanclemente, F. J., Terán-Tinedo, V., & Di Marco, D. (2023). Spanish Validation of the Technostress Creators Scale. Psicothema, 35(1). https://doi.org/10.7334/psicothema2022.198

Babbie, E. (2016). The practice of social research (14th ed.). Cengage Learning.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. Journal of Managerial Psychology, 22(3), 309–328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., Demerouti, E., & Sanz-vergel, A. (2023). Job Demands – Resources Theory : Ten Years Later. 25–53.

Bondanini, G., Giorgi, G., Ariza-Montes, A., Vega-Muñoz, A., & Andreucci-Annunziata, P. (2020). Technostress dark side of technology in the workplace: a scientometric analysis. International Journal of Environmental Research and Public Health, 17(21), 1–25. https://doi.org/10.3390/ijerph17218013

Borle, P., Reichel, K., Niebuhr, F., & Voelter-Mahlknecht, S. (2021). How are techno-stressors associated with mental health and work outcomes? A systematic review of occupational exposure to information and communication technologies within the technostress model. International Journal of Environmental Research and Public Health, 18(16). https://doi.org/10.3390/ijerph18168673

Brod, C. (1982). Managing technostress: optimizing the use of computer technology. The Personnel Journal, 61(10), 753–757.

Camacho, S., & Barrios, A. (2022). Teleworking and technostress: early consequences of a COVID-19 lockdown. Cognition, Technology and Work, 24(3), 441–457. https://doi.org/10.1007/s10111-022-00693-4

Chang, P. C., Zhang, W., Cai, Q., & Guo, H. (2024). Does AI-Driven Technostress Promote or Hinder Employees' Artificial Intelligence Adoption Intention? A Moderated Mediation Model of Affective Reactions and Technical Self-Efficacy. Psychology Research and Behavior Management, 17, 413–427. https://doi.org/10.2147/PRBM.S441444

Dopp, A. R., Parisi, K. E., Munson, S. A., & Lyon, A. R. (2020a). Aligning implementation and user-centered design strategies to enhance the impact of health services: results from a concept mapping study. Implementation Science Communications, 1(1), 1–13. https://doi.org/10.1186/S43058-020-00020-W/TABLES/2

Dutta, D., & Mishra, S. K. (2024b). "Technology is killing me!": the moderating effect of organization home-work interface on the linkage between technostress and stress at work. Information Technology & People, 37(6), 2203–2222. https://doi.org/10.1108/ITP-03-2022-0169

Edwards, J. R. (2008b). 4 Person–Environment Fit in Organizations: An Assessment of Theoretical Progress. Academy of Management Annals, 2(1). https://doi.org/10.5465/19416520802211503

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. MIS Quarterly: Management Information Systems, 19(2), 213–233. https://doi.org/10.2307/249689

Graham, L. M. & M. (2018). The Domestic Turn: Business Process Outsourcing and the Growing Automation of Kenyan Organisations. Globalization, Economic Inclusion and African Workers, 68–86. https://doi.org/10.4324/9781315436494-10

Hang, Y., Hussain, G., Amin, A., & Abdullah, M. I. (2022). The Moderating Effects of Technostress Inhibitors on Techno-Stressors and Employee's Well-Being. Frontiers in Psychology, 12(January), 1–11. https://doi.org/10.3389/fpsyg.2021.821446

KENIA. (2024). Kenya Innovation Outlook (KIO) EMERGING TECHNOLOGIES EDITION. June. www.kenia.go.ke

Kleibert, J. M., & Mann, L. (2020). Capturing Value amidst Constant Global Restructuring? Information-Technology-Enabled Services in India, the Philippines and Kenya. European Journal of Development Research, 32(4), 1057–1079. https://doi.org/10.1057/s41287-020-00256-1

Kumar, A., Krishnamoorthy, B., & Bhattacharyya, S. S. (2024). Machine learning and artificial intelligence-induced technostress in organizations: a study on automation-augmentation paradox with socio-technical systems as coping mechanisms. International Journal of Organizational Analysis, 32(4), 681–701. https://doi.org/10.1108/IJOA-01-2023-3581

Kumar, V., Rajan, B., Salunkhe, U., & Joag, S. G. (2022). Relating the dark side of new-age technologies and customer technostress. Psychology and Marketing, 39(12), 2240–2259. https://doi.org/10.1002/mar.21738

Kwon, M., & Remøy, H. (2021a). User-centred design thinking: Application of UCDT theories to workplace management. A Handbook of Management Theories and Models for Office Environments and Services.

Larsen, M. M., Mkalama, B., & Mol, M. J. (2023). Outsourcing in Africa: How do the interactions between providers, multinationals, and the state lead to the evolution of the BPO industry? Journal of International Business Policy, 6(4), 432–452. https://doi.org/10.1057/s42214-023-00166-z

Laura Mann & Mark Graham. (2021). The Domestic Turn: Business Process Outsourcing and the Growing Automation of Kenyan Organisations. Globalization, Economic Inclusion and African Workers, 68–86. https://doi.org/10.4324/9781315436494-10/DOMESTIC-TURN-BUSINESS-PROCESS-OUTSOURCING-GROWING-AUTOMATION-KENYAN-ORGANISATIONS-LAURA-MANN-MARK-GRAHAM

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. European Journal of Personality, 1(3), 141–169. https://doi.org/10.1002/PER.2410010304

Lee, Z. W. Y., Chan, T. K. H., & Cheung, C. M. K. (2021). Information Technology in Organisations and Societies: Multidisciplinary Perspectives from AI to Technostress. Information Technology in Organisations and Societies: Multidisciplinary Perspectives from AI to Technostress, 1–208. https://doi.org/10.1108/9781839098123/URN:EMERALDGROUP.COM:ASSET:ID:BINARY:9781839098123.LARGECOVER.GIF

Mugenda, O. M., & Mugenda, A. G. (2003). Research methods: Quantitative and qualitative approaches. African Centre for Technology Studies.

Nastjuk, I., Trang, S., Grummeck-Braamt, J. V., Adam, M. T. P., & Tarafdar, M. (2024). Integrating and synthesising technostress research: a meta-analysis on technostress creators, outcomes, and IS usage contexts. European Journal of Information Systems, 33(3), 361–382. https://doi.org/10.1080/0960085X.2022.2154712

Nisafani, A. S., Kiely, G., & Mahony, C. (2020). Workers' technostress: a review of its causes, strains, inhibitors, and impacts. Journal of Decision Systems, 29(sup1), 243–258. https://doi.org/10.1080/12460125.2020.1796286

Norman, D. A., & Draper, S. W. (1986). User Centered System Design,New Perspectives on Human Computer Interaction. In CRC Press.

Novák, J. Š., Masner, J., Benda, P., Šimek, P., & Merunka, V. (2024). Eye Tracking, Usability, and User Experience: A Systematic Review. International Journal of Human-Computer Interaction, 40(17), 4484–4500. https://doi.org/10.1080/10447318.2023.2221600

Oboko, R. O. (2016). Techno Characteristics And Stressors Leading To Behavioural Strains Associated With Technostress Amongst Young People In Kenya.

Ogada Hongo, H., Kwanya, T., & Kiplang, J. (2019). Technostress among Technical University Librarians in Kenya. 2–10.

Padma, V., Anand, N. N., Gurukul, S. M. G. S., Javid, S. M. A. S. M., Prasad, A., & Arun, S. (2015). Health problems and stress in Information Technology and Business Process Outsourcing employees. Journal of Pharmacy and Bioallied Sciences, 7, S9–S13. https://doi.org/10.4103/0975-7406.155764

Pham Thi, T. D., & Duong, N. T. (2024). Investigating learning burnout and academic performance among management students: a longitudinal study in English courses. BMC Psychology, 12(1), 1–15. https://doi.org/10.1186/s40359-024-01725-6

Pichette, M. (2023). OUTSOURCING TO AFRICA: TOP COUNTRIES FOR BPO. Nature, July. https://doi.org/10.1038/d41586-023-01687-6

Porcari, D. E., Ricciardi, E., & Orfei, M. D. (2023). A new scale to assess technostress levels in an Italian banking context: the Work-Related Technostress Questionnaire. Frontiers in Psychology, 14(September), 1–12. https://doi.org/10.3389/fpsyg.2023.1253960

Pullins, E., Tarafdar, M., & Pham, P. (2020). The dark side of sales technologies: how technostress affects sales professionals. Journal of Organizational Effectiveness, 7(3), 297–320. https://doi.org/10.1108/JOEPP-04-2020-0045

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and validation. Information Systems Research, 19(4), 417–433. https://doi.org/10.1287/isre.1070.0165

Salazar-Concha, C., Ficapal-Cusí, P., Peñarroja, V., & Enache-Zegheru, M. (2022). Validation of the Spanish version of the Technostress Creators Scale in Chilean Workers. Anales de Psicologia, 38(3), 518–529. https://doi.org/10.6018/analesps.509551

Saleem, F., & Malik, M. I. (2023). Technostress, Quality of Work Life, and Job Performance: A Moderated Mediation Model. Behavioral Sciences, 13(12). https://doi.org/10.3390/bs13121014

Sanjeeva Kumar, P. (2024). TECHNOSTRESS: A comprehensive literature review on dimensions, impacts, and management strategies. Computers in Human Behavior Reports, 16(August), 100475. https://doi.org/10.1016/j.chbr.2024.100475

Sasidharan, S. (2022). Technostress in the workplace: a social network perspective. Information Technology and People, 35(4), 1219–1238. https://doi.org/10.1108/ITP-09-2020-0649

Scholze, A., & Hecker, A. (2024). The job demands-resources model as a theoretical lens for the bright and dark side of digitization. Computers in Human Behavior, 155(October 2023), 108177. https://doi.org/10.1016/j.chb.2024.108177

Sharma, S., & Gupta, B. (2023). Investigating the role of technostress, cognitive appraisal and coping strategies on students' learning performance in higher education: a multidimensional transactional theory of stress approach. Information Technology and People, 36(2), 626–660. https://doi.org/10.1108/ITP-06-2021-0505

Tarafdar, M., Cooper, C. L., & Stich, J. F. (2019). The technostress trifecta - techno eustress, techno distress and design: Theoretical directions and an agenda for research. Information Systems Journal, 29(1), 6–42. https://doi.org/10.1111/isj.12169

Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. S. (2015). Technostress: Negative effect on performance and possible mitigations. Information Systems Journal, 25(2), 103–132. https://doi.org/10.1111/isj.12042

Tarafdar, M., Stich, J. F., Maier, C., & Laumer, S. (2024a). Techno-eustress creators: Conceptualization and empirical validation. Information Systems Journal, September 2022, 1–35. https://doi.org/10.1111/isj.12515

Tarafdar, M., Stich, J. F., Maier, C., & Laumer, S. (2024b). Techno-eustress creators: Conceptualization and empirical validation. Information Systems Journal. https://doi.org/10.1111/ISJ.12515

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. Journal of Management Information Systems, 24(1), 301–328. https://doi.org/10.2753/MIS0742-1222240109

Tarafdar, M., Tu, Q., Ragu-Nathan, T. S., & Ragu-Nathan, B. S. (2011). Crossing to the dark side: Examining creators, outcomes, and inhibitors of technostress. Communications of the ACM, 54(9), 113–120. https://doi.org/10.1145/1995376.1995403

Tzu, S., Ken, T., Habaradas, R., Wei, I., Ting, K., & Kweh, Q. L. (2016). Technostress in a Call Center in Philippines. International Journal of Business Management, 1(2).

van der Merwe, M., & Armitage, G. (2019). Towards a provisional workplace e-learning acceptance framework for developing countries. Communications in Computer and Information Science, 933. https://doi.org/10.1007/978-3-030-11235-6_15

van Velsen, L., Ludden, G., & Grünloh, C. (2022). The Limitations of User-and Human-Centered Design in an eHealth Context and How to Move Beyond Them. Journal of Medical Internet Research, 24(10), e37341. https://doi.org/10.2196/37341

Wang, X., & Cheng, Z. (2020). Cross-Sectional Studies: Strengths, Weaknesses, and Recommendations. Chest, 158(1), S65–S71. https://doi.org/10.1016/j.chest.2020.03.012

Wang, X., & Li, B. (2019). Technostress among teachers in higher education: An investigation from multidimensional person-environment misfit. Frontiers in Psychology, 10(JULY). https://doi.org/10.3389/fpsyg.2019.01791

Wang, X., & Yu, X. (2024). Art Students' Technostress, Perceived Usefulness, Satisfaction, and Continuance Intention to Use Mobile Educational Applications. SAGE Open, 14(2), 1–11. https://doi.org/10.1177/21582440241260206

Wang, Z., Zhang, L., Wang, X., Liu, L., & Lv, C. (2023). Navigating Technostress in primary schools: a study on teacher experiences, school support, and health. Frontiers in Psychology, 14(November), 1–16. https://doi.org/10.3389/fpsyg.2023.1267767

Wu, A., Roemer, E. C., Kent, K. B., Ballard, D. W., & Goetzel, R. Z. (2021). Organizational best practices supporting mental health in the workplace. Journal of Occupational and Environmental Medicine, 63(12), E925–E931. https://doi.org/10.1097/JOM.0000000000002407

Zhang, Z., Zhang, W., Zhang, S., Chen, Y., Wang, X., Fujii, Y., & Furuya, N. (2024). Person-environment fit theory in built environment: a scoping review. Journal of Asian Architecture and Building Engineering, 00(00), 1–17. https://doi.org/10.1080/13467581.2024.2373824

Zhao, G., Zhao, R., Yan, X., Conceição, S. C. O., Cheng, Z., & Peng, Q. (2024). The effects of technostress, intolerance of uncertainty, and ICT competence on learning burnout during COVID-19: a moderated mediation examination. Asia Pacific Journal of Education, 44(2), 408–426. https://doi.org/10.1080/02188791.2022.2071835

Zhen, Y., Sugasaki, M., Kawahara, Y., Tsubouchi, K., Ishige, M., & Shimosaka, M. (2021). AI-BPO: Adaptive incremental BLE beacon placement optimization for crowd density monitoring applications. GIS: Proceedings of the ACM International Symposium on Advances in Geographic Information Systems, 301–304. https://doi.org/10.1145/3474717.3483964

Zone, P. E. (2024). The Future Of Outsourcing Excellence : Welcome to TRIFIC SEZ , Africa ' s Gateway To The World ! April.