

Digital transformation as a sociological challenge is reshaping the roles of university professors

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Abstract---In recent years, the higher education sector has witnessed profound technological changes, similar to those occurring across various institutional fields in Algeria. This article aims to shed light on the phenomenon of technostress as a defining feature of the contemporary era, particularly in the context of rapid digital transformations affecting multiple domains, especially higher education. Technostress has become one of the most prominent psychological and professional challenges within the modern university environment. This study is guided by the following central question: How does digital transformation contribute to the emergence of technostress among university professors, and what strategies can be adopted to mitigate its impact? The article begins by clarifying the concept of technostress, its main causes, manifestations, and coping strategies, drawing on a corpus of recent studies. The theoretical insights indicate that technostress arises from a mismatch between the demands of the digital environment and users' capabilities, and it manifests in various forms. Among its most significant causes are communication overload and the blurring of boundaries between personal and professional life resulting from continuous technological advancements. Conversely, the study identifies a set of preventive mechanisms to limit the spread of this phenomenon. The article concludes that addressing technostress requires a comprehensive approach that integrates organizational, psychological, and technical support, ensuring that university professors can adapt to the demands of digital transformation without compromising their mental well-being or professional effectiveness.

Keywords---Technostress, Digital Transformation, University Environment, Professional Effectiveness.

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Introduction

Contemporary technologies have generated new social structures that have imposed themselves on educational and pedagogical arenas. The emergence of digital software has triggered a revolution in everyday life across all social environments. Despite its numerous benefits, it has also produced a range of harms that have raised serious concerns. The very communication opportunities created by these technologies have paved the way for the rise of their negative consequences in society.

Nevertheless, these technologies carry latent risks, the most prominent of which is the constant burden placed on Internet users as a result of social expectations to respond to online communication, the massive volume of digital content that must be managed, and the habitual tendency to combine Internet use with other simultaneous activities. All of these factors expose users to a form of stress known as technostress, which undermines their psychological well-being, affects their cognitive processes, and weakens their real-life social resources beyond the digital space.

Contemporary studies have increasingly focused on this concept as a hallmark of the digital age. Among these is the study by Wang & Li (2019), which indicates that university professors are facing rising levels of technostress due to the accelerating digital transformation of higher education institutions. The study adopts the Person–Environment Misfit Theory to explain this type of stress, emphasizing that the mismatch between institutional technological demands and the capabilities of faculty members represents the primary source of technostress. The findings show that such tension leads to decreased job satisfaction and academic performance, especially when professors feel that technological requirements exceed their skills or the institutional support available to them.

Accordingly, this article seeks to examine the concept of technostress, identify its major causes and various manifestations, and present preventive strategies to mitigate its impact.

1. The Concept of Technostress

The term has been referred to by several labels, including technostress, technophobia, techno-addiction, and even techno-eustress (Zhao et al., 2020, p. 32). Multiple definitions have been proposed, including: Craig Brod (1984)—the first to introduce the term—defined technostress as a “modern disease resulting from the inability of individuals to cope healthily with new technologies.”

It is a phenomenon emerging from the stress experienced by employees due to their use of information and communication technologies, with institutions increasingly recognizing its negative effects on their workforce (Brod, 1984, p. 31).

Tarafdar et al. (2007) define it as a negative psychological response arising when technological demands exceed an individual’s ability to cope.

It may also manifest as stress caused by computer use, appearing in the form of fear, confusion, anxiety, or apprehension (Brod, 1984, p. 10).

Rademaker et al. (2023) describe it as the inability of individuals or organizations to adapt to or operate newly introduced technologies.

It results from individuals’ inability to manage computer technologies safely or effectively (Khan & Mahapatra, 2017, p. 40).

It is a term referring to the overload of stressors in technology-intensive workplaces, particularly knowledge-based environments, where ICT increases productivity yet simultaneously becomes a major source of tension (Zhao et al., 2020, p. 60).

Salanova et al. (2013) define it as a state of mental fatigue and anxiety caused by continuous exposure to digital technologies in work settings.

From these definitions, technostress can be understood as a form of psychological and mental strain resulting from excessive or complex use of digital technologies, reflected in feelings of anxiety, fear, and

cognitive exhaustion due to continuous reliance on ICT tools in the workplace—ultimately harming employees' psychological and physical health and reducing their productivity.

2. Causes of Technostress

a. Communication Overload

Communication overload arising from the use of ICT in the workplace places employees under considerable pressure, leading to stress, reduced well-being, and impaired mental health. Managing vast streams of digital information causes cognitive fatigue, lower productivity, and sometimes resignation.

According to McGovern (2021, p. 28), this stress appears when technologies amplify the volume and complexity of cognitive tasks. This is consistent with Tarafdar et al. (2007) who identified communication overload as a key component of their five-factor model of technostress creators.

Shirley et al. (2021) emphasize the need for timely organizational interventions to mitigate long-term health consequences. ICT exposes individuals to immense volumes of information from diverse sources, overwhelming their processing capacity and pushing them to work faster—often resulting in reduced performance and elevated stress.

b. Intrusion into Personal Life

The spread of digital networks, mobile devices, and wireless connectivity has created an “always-connected” culture in which individuals feel they have lost control over their personal time and private space. Continuous exposure to emails, calls, and online platforms creates a sense of being unable to disconnect. Employees often find themselves managing endless streams of communication, causing workdays to extend and overlap with personal life.

c. Technological Complexity

Technological capabilities, interfaces, and terminology have grown increasingly complex in recent years. Institutions frequently adopt rapid cycles of technological upgrades, leaving employees struggling to keep pace. As previous knowledge becomes obsolete, individuals feel overwhelmed and incompetent—especially without adequate training (McGovern, 2021, p. 32).

Although some workers may initially feel motivated to learn new tools, repeated updates eventually lead to frustration, stress, and feelings of inadequacy when facing technical malfunctions or system failures.

d. Technological Insecurity

Technological insecurity refers to the fear of professional displacement resulting from rapid technological progress. Employees may fear losing their jobs or status due to an inability to adapt to new systems. Rapid ICT updates force employees to continually adjust, while previously acquired skills become outdated. This triggers constant anxiety over losing control, being marginalized, or even being replaced (Tarafdar et al., 2005, p. 173).

3/Manifestations of Technostress

Technostress represents one of the most significant challenges in contemporary work environments. Although technology has become a fundamental component of daily tasks, it simultaneously constitutes a growing source of psychological, cognitive, and physical strain. When individuals experience difficulties adjusting to the demands of digital systems or when they overuse modern technologies, several manifestations or symptoms emerge that reflect the impact of such stress on their psychological and professional balance. These manifestations serve as indicators for assessing the degree to which workers suffer from technostress in digital work environments. (The following diagram illustrates the primary manifestations of technostress.)

Figure 1. Manifestations of Technostress

3. Strategies for Coping with Technostress

After identifying the core manifestations of technostress, it becomes essential to outline the preventive mechanisms that may mitigate its intensity. The most prominent strategies include:

a. Continuous Training

Training is not merely a process for transferring technical skills; rather, it is a means of reintegrating individuals into the new professional and social order shaped by technological change. Each digital transformation brings about shifts in work patterns, interactions, and power structures within institutions. Thus, training becomes a form of continuous professional socialization, enabling university professors to acquire new values, norms, and roles aligned with the culture of digital work. Training should not be generic; it must be tailored to the specific needs of each instructor, depending on teaching content, workload, and existing skill levels. Such individualized training reduces stress and transforms learning into a gradual process. The findings of Tarafdar and colleagues emphasize the importance of training and skill-building as moderating factors (Mahmoud et al., 2025, p. 70).

b. Enhancing Digital Competence and Self-Efficacy Through Professional Collaboration

Research by Kim and Lee (2021) shows that strengthening self-efficacy in dealing with technology reduces digital anxiety and stress while improving job performance. When individuals possess stronger technological confidence, they perceive digital tools as less threatening and are better able to adapt to rapid updates. Building digital competence through peer learning—especially from more experienced colleagues—helps diminish feelings of isolation when facing technical problems. Social support functions as a buffer against technostress (Mahmoud et al., 2025, p. 71).

c. Time Management

One of the main causes of technostress is poor organization, which leads to task overlap, creating both mental and physical exhaustion. Findings by Mahmoud et al. (2025, p. 69) recommend structuring one's time and designating specific periods for digital device use to avoid the "technological invasion" that leads to cognitive fatigue. Effective time management helps prioritize digital tasks, utilize technology purposefully, reduce anxiety and stress, and establish a healthy boundary between personal and professional life.

d. Providing High-Quality Technological Infrastructure and Technologically Supportive Leadership

This strategy is among the most critical mechanisms for mitigating technostress. Updated, user-friendly technological systems reduce technical errors and disruptions that typically cause frustration and anxiety. Frequent system failures, poor connectivity, or slow performance generate feelings of helplessness and loss of control, whereas robust digital infrastructure enhances users' technological self-efficacy and enables efficient task performance (Srivastava, Chandra, & Shirish, 2015, p. 370).

Moreover, technologically supportive leadership plays a decisive role in alleviating technostress. Leaders who understand the challenges posed by digital transformation provide ongoing emotional and technical support, encourage adaptation to new tools, and reduce fear of failure or negative evaluation. This fosters confidence and digital resilience among employees (Srivastava et al., 2015, p. 370).

General Conclusion

Through the theoretical and field components of this study—conducted using a descriptive-analytical approach—we sought to identify the level of technostress experienced by university professors in the context of ongoing digital transformation, as well as its impact on academic performance. The study sample consisted of 40 sociology professors selected through simple random sampling to assess their exposure to technostress during digital tool usage.

A semi-structured interview served as the primary data collection tool, with its guide designed to cover key dimensions of technostress, including:

- New functional burdens

- Digital skills

- Technical challenges and technological infrastructure

- Cognitive readiness for technological change

The findings revealed that:

Most professors struggle with technical challenges, particularly those stemming from weak digital infrastructure such as poor Internet connectivity, interruptions in digital platforms, and system overload. These issues impose additional burdens on instructors, particularly in hybrid teaching models (online and in-person), and institutional support often proves insufficient, thereby increasing stress instead of reducing it.

There is a significant disparity in digital skills, especially among professors with 25–35 years of teaching experience. Limited time for learning new technologies, increased workload, and rapid technological advancements create resistance to digital change due to feelings of low digital competence, failure to meet required standards, and the resulting psychological and cognitive stress that diminishes the quality of academic work.

Digital transformation requires continuous monitoring of technological tools, expanding the professor's role to include hybrid teaching, student supervision, engagement in research teams, and adaptation to electronic teaching requirements. Difficulties arise from limited technological mastery, insufficient training, or resistance to change. These combined factors have multiplied the roles expected of professors and placed substantial additional pressure on them, culminating in elevated levels of technostress.

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