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Navigating Digital Challenges: The Role of Self-Efficacy in Coping with Technostress in Remote Regions

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ABSTRACT

The rapid expansion of digital technologies has reshaped higher education, creating both opportunities and pressures for lecturers, particularly in resource-constrained regions. This study explores the phenomenon of technostress and its impact on lecturers' self-efficacy in *Terdepan, Terluar, dan Tertinggal* (3T) regions. Based on the Person–Environment Fit Theory and self-efficacy theory, the research investigates how lecturers experience and respond to digital demands amid infrastructure limitations. Using a qualitative phenomenological design, nine lecturers from diverse disciplines participated in in-depth interviews. Thematic analysis revealed five interrelated dimensions: techno-overload, techno-complexity, techno-uncertainty, the mediating role of self-efficacy, and institutional and cultural support. Digitalisation intensified workloads, platform complexity challenged senior lecturers lacking formal training, and unstable systems increased uncertainty. Higher self-efficacy fostered adaptive coping, whereas lower self-efficacy encouraged avoidance strategies. Findings highlight that technostress in underdeveloped higher education settings is not only an individual struggle but also a systemic issue shaped by weak infrastructure, inconsistent institutional support, and cultural dynamics. While self-efficacy strengthens resilience, it cannot offset structural inequities. The study extends the technostress literature in underdeveloped regional contexts and highlights the need for sustained infrastructure investment, structured training, and culturally grounded mentors to support inclusive digital transformation.

KEYWORDS *Technostress, Self-Efficacy, Higher Education, Phenomenology, 3T Regions, Indonesia*

INTRODUCTION

Information and communication technology (ICT) has experienced rapid growth and is significantly changing life in higher education globally (Bagde et al., 2021; Pegu, 2014; Zafar, 2019). This means that online platforms, digital learning environments, and collaborative tools are now essential for academic instruction, research, and university administration (Alenezi, 2023; Samoylenko et al., 2022). Among other benefits, these technologies streamline institutional processes, broaden access to education, and connect people across the world (Al-Samarraie & Saeed, 2018; Rafiq et al., 2024). However, these changes also present new challenges for educators, particularly those in under-resourced areas. A prevalent concern is technostress, which arises when the demands of technology exceed an individual's capacity to meet them—a condition grounded in the Person-Environment (P-E) fit model, which holds that stress emerges when there is a mismatch between environmental demands and an individual's capabilities. For teachers, technostress may manifest as navigating multiple digital platforms, experiencing frustration with technical failures, being required by institutions to adopt new online tools, or feeling overwhelmed by the rapid pace of technological change. Such pressures can diminish engagement and motivation and, most critically, erode teachers' sense of self-efficacy—their confidence in their ability to perform effectively in digital environments.

Drawing on Bandura's social cognitive theory, self-efficacy plays a central role in how individuals perceive their capabilities and approach technology use. Teachers with high technological self-efficacy are more likely to adopt new tools, persist through technical difficulties, and view digital change positively. Conversely, those with low self-efficacy may experience heightened stress, avoid technology, and struggle to teach effectively. This underscores the reciprocal relationship between technostress and self-efficacy as a critical determinant of how teachers respond to digital transformations in the classroom. Most existing studies on technostress and self-efficacy have been conducted in well-resourced or urban contexts, such as those in Europe, North America, and East Asia. These studies often highlight issues such as platform overload, data privacy, and digital surveillance. However, comparatively little attention has been paid to teachers in lower-income or low-resource regions, where inadequate internet connectivity, limited access to devices, insufficient training, and inadequate institutional support compound the experience of technostress.

Cultural, social, and generational factors also shape how teachers perceive and cope with these pressures. Indonesia presents a compelling context for examining these issues, particularly in its 3T regions (*Terdepan, Terluar, Tertinggal*—frontier, outermost, and underdeveloped areas). Papua Barat, including Manokwari, has critically limited digital infrastructure. Data from the Badan Pusat Statistik (BPS, 2023) indicate that only approximately 26.3% of households in Papua have reliable internet access, highlighting the significant extent of the digital divide. For local educators, digital transformation entails not only adapting to new curricula and pedagogical approaches but also navigating the fundamental challenges that amplify the psychological burden of technology use. Their experiences offer important perspectives on how technological constraints, institutional pressures, and individual resilience intersect. Investigating teacher experiences in Manokwari allows this study to address the considerable impact of technostress on teachers' confidence and their efficacy in teaching with technology. Employing a phenomenological approach, this research seeks to uncover how teachers understand their challenges and the strategies they employ to manage them. Unlike quantitative approaches focused on broad trends, this methodology emphasises the specificity of individual accounts within their lived contexts. The study thereby contributes to the broader discourse on technostress and technological self-efficacy, with relevance to communities where digital transformation unfolds amid conditions of limited resources.

Despite this, limited empirical research has examined the impact of technostress on self-efficacy among lecturers in Indonesia's 3T higher education institutions. Accordingly, this study focuses on Manokwari, Papua Barat, contributing to scholarship on this specific regional context and addressing a contextual gap left by prior studies, which have largely been confined to urban, economically developed settings with a singular focus on technostress.

This article makes three primary contributions. First, it provides empirical evidence of how technostress manifests in higher education settings in resource-poor communities with limited infrastructure and inadequate institutional support. Second, it examines the role of self-efficacy as both a moderating factor and an outcome of technostress, demonstrating the critical importance of psychological resilience under digital pressures. Third, it offers practical recommendations for more inclusive planning and policy that can facilitate digital

transformation in higher education, particularly in 3T contexts. The study also addresses both the challenges and opportunities presented by technostress to advance understanding of equity and possibility in digital higher education. The article proceeds by reviewing the existing literature on technology-related anxiety and self-efficacy in education, situating the discussion within the broader context of unequal access to technology. It then outlines the specific methodological approaches employed, presents key findings from interviews conducted with educators in Manokwari, and discusses their theoretical, practical, and policy implications. The article concludes with recommendations for institutions and policymakers aimed at strengthening self-efficacy and reducing technology-related stress in less developed regions.

METHOD

This study employed a qualitative phenomenological approach to explore the lived experiences of lecturers experiencing technostress in Manokwari. This approach was particularly appropriate given that technostress extends beyond technical or cognitive dimensions to encompass emotional and personal dimensions, providing a suitable foundation for examining that subjective reality. Rather than quantifying outcomes, this methodology enabled the researcher to gain insight into how lecturers in resource-poor areas made sense of the demands of digital transformation, the pressures they encountered, and the impact of those pressures on their competence and self-efficacy. This outlook examined not only the surface manifestations of stressors but also their deeper meanings, coping mechanisms, and cultural dimensions.

The study was conducted in Manokwari, Papua Barat, Indonesia, which is classified as one of the *Terdepan, Terluar, dan Tertinggal* (3T) regions. Higher education institutions in this context faced specific challenges, including erratic internet connectivity, limited ICT capacity, and insufficient institutional support. This location was selected purposively as a comparatively under-researched setting in which the impact of technostress on self-efficacy was likely to be compounded by systemic structural inequalities. While universities in Manokwari were in the process of pursuing digital transformation, they remained significantly constrained by structural barriers, providing a valuable context for examining how lecturers adapted—or struggled to adapt—to technological demands under conditions of scarcity.

Purposive sampling was employed to recruit nine lecturers from two universities in Manokwari. Inclusion criteria were as follows: (1) currently employed as a lecturer at a higher education institution in Manokwari; (2) using digital technology in academic activities; (3) experiencing difficulties with technology; and (4) willing to participate in an in-depth interview. The sample comprised both junior and senior lecturers from diverse disciplinary backgrounds, including education, social sciences, and natural sciences. This diversity enabled the study to capture a range of technostress experiences across varying levels of age, digital skills, and professional background. All participants were informed of the study's purpose, provided informed consent, and were assured of confidentiality through full anonymisation of their responses.

Data were collected through semi-structured in-depth interviews conducted in both face-to-face and online (Zoom) formats. Each interview lasted between 45 and 70 minutes. Interview themes included: (1) perceived changes in the technological environment at their institution; (2) sources of technology-related stress, such as workload, complexity, and

uncertainty; (3) the impact of technology on teaching confidence and competence; (4) strategies employed to manage technostress; and (5) institutional and peer support. Open-ended questions invited participants to narrate their experiences, with probing follow-up questions used to deepen reflection and allow for flexible exploration based on participant responses.

Data analysis followed Van Manen's phenomenological framework, comprising six analytic steps: identifying the phenomenon, collecting empirical sources, writing thematic descriptions, reflecting, maintaining closeness to the phenomenon, and formulating an essential description of the experience. Within this framework, qualitative coding proceeded in three stages. First, open coding was applied, in which significant portions of the interview transcripts related to technostress, self-efficacy, and digital literacy were identified and coded. Second, axial coding was used to group initial codes into categories and subthemes, creating a structured framework for thematic organisation. Third, selective coding was employed to construct a coherent narrative encompassing the core dimensions of lecturers' experiences. The coding process was iterative and reflective, with initial codes cross-referenced across transcripts to identify patterns, similarities, and differences. Emerging categories were refined through repeated reading and analysis, and final themes were selected based on coherence across multiple informants. NVivo software was used to facilitate coding and data organisation, while interpretation remained inductive and researcher-driven.

To strengthen the rigour of the study, source triangulation was employed by comparing responses across lecturers from different institutions in Manokwari to assess the consistency of perspectives on key themes such as technostress, self-efficacy, and digital literacy. All coding, including theme and subtheme documentation and contextual interpretation, was systematically recorded throughout the analytic process using NVivo. Interview transcripts were preserved in digital and audio formats to ensure the validity of data sources and to serve as the basis for subsequent thematic analysis, ensuring that the meanings expressed by participants were not distorted by researcher interpretation.

The study was conducted in accordance with institutional ethical guidelines. Participation was voluntary, and participants were informed of their right to withdraw at any time. All data were anonymised and securely stored to protect participant identities. Given that discussions of workplace stress can be sensitive in nature, interview questions were approached with care, and participants were permitted to decline to address topics they were not comfortable discussing. It is acknowledged that the phenomenological nature of the study means the findings are context-specific to Manokwari and are not intended to be broadly generalised. Additionally, internet connectivity challenges occasionally limited the depth of some online interviews.

RESULT AND DISCUSSION

Interviews with 9 lecturers in Manokwari in the study formed a complex picture of how technostress develops in underdeveloped higher education contexts and the impact of technostress interaction with lecturers' own self-efficacy in five major themes.

1. Techno-Overload and Work Intensification

Many lecturers said they found themselves overwhelmed by the volume and pace of tasks driven by digital media. It gave many reasons to describe how digitalization led lecturers to multiply workloads rather than diminish them. Several lectures stated:

> "What makes it difficult is the number of application types and the number of digital platform offerings on offer from various digital technology service providers. That's what overwhelms us. For instance, if you think about BKD, there is SISTER, and then there is SINTA, and then the whole host of other platforms that are brought to their organization by the ministry. Thus, we are split between uploading, teaching or doing research. And that has really become a trouble for us" (Participant 1).
>
> "I feel overwhelmed and stressed personally, because so many applications I have to learn and if I do not know how to use them, I need to ask someone that understands better." (Participant 2).

This is a real example of how lecturers felt techno-overload, the feeling that digital tools create excessive demand rather than relieve it.

2. Techno-Complexity and the Struggle for Competence

A second theme that emerged often was the difficulty of learning new systems as we are not prepared to master them without proper training. The senior lecturers reported the feeling of incompetence and anxiety when confronted with complex platforms. One of the senior lectures said:

> "I am a senior lecturer and nearly 60 years old. Even the ability to turn on Zoom correctly can sometimes be stressful for me. Younger colleagues do that perfectly easily, but for me, it makes so much energy" (Participant 6).

This feeling of inadequacy happened due to not receiving structured training. Most participants reported less formal institutional support, and most said they turned to peer support or YouTube tutorials. Furthermore, another lecturer said:

> "We were never properly trained. Typically, when I'm confused, I either ask a colleague or go to YouTube. The university only requests, use this, use this, except they do not lead us." (Participant 5).

This is a part of techno complexity, a central part of technostress, when the skills of the lecturers are at odds with the demands of the technology. Younger lecturers are often more likely to adapt quickly, but the generation gap led to tension, as senior lecturers were ashamed to admit that they struggled

3. Techno-Uncertainty and the Fear of Falling Behind

Lecturers also voiced frustration with the ever-evolving changes in both digital tools and specifications. Intermittent internet access and changes in government requirements of online reporting contributed to a climate of uncertainty.

> "When we have AI, for example, we needed to find out how to use it again. But we cannot fail if we do not learn. What presents a challenge is that of conversion of information in digital technology. In other countries it might be easier, but in Papua it's different. Without online references, we will struggle and fall behind. That's the stress that occurs here. We will be left behind as technology evolves, and we can keep up or fall behind. That is where the real stress is. (Participant 1).

Reluctant infrastructure played into this uncertainty in the 3T phase. Most of the lecturers had lost work due to unexpected power outages or unsecure internet connections.

> "I have experience teaching, but, as I said before, we reside in the eastern part of the country and there are usually internet network issues. For instance, the connection to

> the internet is either not available or unreliable when we want to find stuff. (Participant 2).
>
> "They can mean, for example, stress when, in case we like to work, our schedule is packed, but time is too short. With technology that, as a result, with advanced but not reliable internet connection, makes us even more strained. Even here in Papua, the internet has failed occasionally and that's a big barrier to finishing our assignments." (Participant 3).

This reflects techno-complexity where lecturers' skills and the demands of technology are misaligned. Younger lecturers often adapted more quickly, but this generational gap created tensions, as senior lecturers felt embarrassed to admit their struggles.

4. The Role of Self-Efficacy in Coping with Technostress

Notwithstanding these limitations, higher self-efficacy in lecturers was associated with greater resilience. They reinterpreted challenges as lessons rather than challenges to ability as mentioned by several lecturers below:

> "From us as academics, the advice is that we must always keep learning and be quick to grasp every piece of information, such as new programs. If we don't frequently update ourselves, we will fall behind. Therefore, we must be open to embracing new technologies so that they can make our system easier both for us as lecturers in teaching and for students who will later benefit from it." (Participant 3).
>
> "I feel very secure about it, as it brings me enjoyment, learning new things. It is a thrilling activity as well it expands my knowledge and views. By the very same token, those systems can occasionally simplify where we do our work." (Participant 5).

These lecturers adopted problem-solving strategies using tools like new platforms, online materials, or collaborative exercises on new systems or teaching with fellow teachers at university. On the other hand, lecturers with low self-efficacy tend to shirk technology to almost never involve it, assigning tasks or expecting minimal compliance. Younger lecturers reported significantly higher levels of self-efficacy that were somewhat correlated with previous experience of their own studies with digital tools during their practice. This may be related to some degree to prior exposure to new digital materials and resources in use during their own academic activities. But a few of the older lecturers gain confidence through practice, indicating self-efficacy isn't completely age-dependent, but can be influenced by experience and attitude.

5. Institutional and Cultural Supports as Moderators

Lastly, the results suggest that institutional and cultural support plays a crucial role in reducing technostress. At universities where even modest training was offered, the lecturers reported feeling more confident and less anxious.

> "Yes, if there is support such as guidance, training, and help from colleagues, it can reduce the pressure of technology. In other words, even if we do not fully understand at first, with that support we can come to understand" (Participant 8).

Peer collaboration was also crucial as an important form of coping behavior, which illustrates the collectivist culture of Indonesia. Youthful training also offered informal mentoring between younger and older colleagues as a route to technical instruction and emotional support.

> "Looking for solutions and then seeking help from friends who understand better how to operate the application, because honestly, I sometimes do not really master how to operate it. "(Participant 8)

The participants emphasized that institutional support was infrequent, being reactive rather than preventative. The lack of organized training programs, while infrastructural problems persisted, meant coping strategies tended to be personal and informal.

Discussion

The results indicate that technostress among lecturers in Manokwari is not only caused by individual problems but more by structural ones, such as a lack of infrastructural support, institutional gaps, and generational gaps. Despite an increase in self-efficacy being able to help lecturers cope with technostress, it cannot replace structural problems such as cultural norms, organizational structure, and workplace environment design (Armitage & Amar, 2021; Yoo et al., 2025). Technostress here is best understood from a person–environment fit perspective, where a mismatch between technology demands and resources leads to enduring strain. The study by Tarafdar et al. (2019) that argued the key components of technostress — techno-overload, techno-complexity, and techno-uncertainty — supports this finding. In Manokwari's case, these dimensions were not only present but intensified through infrastructural and institutional weaknesses. For example, the lecturers' experience of techno-overload aligns well with Tarafdar et al.'s (2019) conceptualization of technology-driven work intensification (see below). However, the work–life divide is further blurred in this context, compounded by culturally ingrained notions of constant availability as well as the lack of institutional frameworks. This highlights that technostress manifests differently within weak organizational support structures. In much the same way, techno-complexity, often studied in corporate environments, takes on new meaning here as it is intensified by generational divides and the absence of structured training. Senior lecturers' struggles echo previous studies that found that age and digital literacy mediate technostress, although the use of peer-to-peer mentoring underscores the salience of coping strategies in collectivist cultures. In this regard, the technological uncertainty found in this study aligns with previous studies that emphasize the stress caused by dynamic systems (Califf et al., 2020). However, in Manokwari, uncertainty is compounded by the fragility of infrastructure (power outages, unstable internet). Therefore, these findings extend the literature by demonstrating how technostress dimensions are contextually conditioned by systemic inequities in underdeveloped contexts, leading to anxiety and frustration (Huang & Haried, 2020).

In line with Bandura (1977), self-efficacy was identified as a key moderating factor in stress responses. Lecturers with higher self-efficacy engaged in more problem-focused coping and relied on their confidence to adapt. This is consistent with Wang and Li (2019), who showed decreased ICT anxiety among educators attributable to self-efficacy. However, the Manokwari case reveals that self-efficacy is not uniform. Younger lecturers tended to use many digital tools without being coached or practicing regularly, which created a gap that older lecturers found difficult to bridge. This suggests that self-efficacy is amenable to development but requires a degree of institutional scaffolding (Saleem et al., 2021). Low self-efficacy can result in avoidance behavior and disengagement, particularly in the absence of training and reinforcement (Hua & Howell, 2022). Such findings also add nuance to the literature by elucidating how self-efficacy functions under systemic limitations. Even self-

assured lecturers experienced stress when infrastructure breakdowns undercut their efforts. Thus, individual resilience cannot replace the need for organizational and structural change.

Regarding institutional and cultural norms for coping, the study suggests that institutions operate in parallel with culture to provide mechanisms for coping (Solís et al., 2023). While there was some unevenness in institutional support, even small workshops elevated the confidence of lecturers. Al-Fudail and Mellar (2008) highlighted this and further indicated that organizational support would be needed to minimize technostress in education. Collectivist cultural practices such as peer mentoring and informal knowledge-sharing also served as important buffers to these challenges (Pramudya et al., 2025). Unlike Western contexts, where coping tends to be individualized, lecturers in Manokwari relied on joint problem-solving. This suggests that programs grounded in local culture and community may perform better than Western-style approaches. Yet overreliance on colleagues' support may reinforce existing power asymmetries, and not all teachers will have access to support from professionals who understand technology (Yang et al., 2025). Solutions, however, will require systematic and deliberate steps by training departments to normalize professional development and ensure that technology functions reliably.

CONCLUSION

This study underscores that technostress is not an individual problem but a structural one, shaped by technological configurations, organizational weaknesses, and cultural traditions, particularly in remote and underserved regions such as Manokwari. While self-efficacy can help lecturers navigate digital demands, meaningful solutions must address systemic inequities and incorporate local cultural practices within formal institutional support. The study makes three key contributions to the existing literature: it centers the experiences of lecturers in lower-income, non-Western academic contexts; it illuminates how a mismatch between technology and environment intensifies stress when infrastructure is poor and institutional authority is weak; and it demonstrates how collectivist cultural values shape coping strategies in ways that are largely absent from mainstream technostress research. On a practical level, self-efficacy training should be embedded within lecturer development programs through guided practice and reflective feedback, while institutional support mechanisms such as peer-mentoring schemes, collaborative learning communities, and workshops should reinforce these efforts. At the policy level, investment in digital infrastructure must be paired with capacity-building programs to ensure that digital transformation is both equitable and sustainable. Acknowledging that the phenomenological approach and small sample of nine lecturers limits the generalizability of these findings beyond the specific context of Manokwari, future research should consider employing mixed-methods designs that combine qualitative insight with broader survey data, conducting longitudinal studies to track changes in self-efficacy as lecturers gain greater exposure to technology over time, and extending comparative analyses across different 3T regions and provinces in Indonesia to identify wider patterns and contextual variations.

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