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Abstract: This systematic literature review (SLR) explores technostress among educators in post-COVID-19 education. While technostress—stress caused by technology use—has been extensively studied in non-educational settings, its impact on educators remains underexamined, particularly as the pandemic accelerated digital adoption in teaching. This review addresses this gap by analysing the key stressors associated with technology, their underlying causes, their effects on educators, and potential mitigation strategies, including the role of counselling. We used the PRISMA guidelines to search six academic databases (Emerald Insight, ProQuest, Taylor & Francis, SAGE, ScienceDirect, and Scopus) for peer-reviewed studies published between 2020 and 2025 that look specifically at tech-related stress among teachers. The search initially yielded 1,142 articles, with 23 meeting the inclusion criteria for in-depth analysis. The findings reveal that excessive digital workloads, the complexity of new technological tools, work-life imbalance, and inadequate institutional support are primary contributors to technostress. These challenges are further exacerbated by limited training and resources. Additionally, individual factors such as digital competence, self-efficacy, and Technological Pedagogical Content Knowledge (TPACK) play a significant role in determining educators' ability to cope with technology-related stressors. This review provides valuable insights into the challenges of technostress and outlines strategies for intervention. The findings offer practical recommendations for educational institutions, policymakers, and counsellors to create more sustainable and supportive digital learning environments.

Key Words: Technostress; Educators; Digital Competence; Work-life Imbalance; Counseling Intervention; Post-Covid-19

INTRODUCTION

In the 21st century, technology has become an integral part of education, transforming teaching methods and learning experiences. The widespread adoption of digital tools has revolutionised the way educators engage with students, develop instructional materials, and assess learning outcomes. Graham et al. (2009) noted that integrating technology into education has driven significant changes in the teaching profession, influencing both learning approaches and instructional methods. Adedoyin and Soykan (2020) reported that the COVID-19 pandemic accelerated technological advancements in education, forcing institutions to adopt online and hybrid learning models. During the pandemic, classroom teaching shifted rapidly from in-person instruction to remote and hybrid formats. Schools and

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universities had to quickly adapt to digital platforms, online collaboration tools, and virtual classrooms to ensure learning continuity despite widespread restrictions (Trust & Whalen, 2021). This period of "forced innovation" was not a voluntary shift but a necessary adaptation to sustain education during school closures and social restrictions (González et al., 2023; Howard et al., 2022). However, the role of technology in education extends beyond the pandemic. Wekerle et al. (2022) explain that technology is not just a substitute for traditional learning but also enhances interaction quality and engagement in the learning process. Zhang (2022) also highlights its crucial role in educators' professional development, providing access to a wider range of resources and enabling more innovative teaching approaches. The rapid shift toward digitalisation has increased reliance on technology-based platforms such as learning management systems (LMS), video conferencing tools like Zoom, and collaborative applications like Google Classroom (Joo et al., 2016; Markowitz et al., 2018). These platforms have facilitated remote and hybrid learning while also improving communication, resource sharing, and assessment processes, ensuring learning continues despite external disruptions.

Research has shown that technology significantly enhances teaching effectiveness and learning outcomes. Metaria and Cahyono (2024) found that technology increases student engagement in academic tasks such as attendance, assignment completion, and class discussions. Salhab & Daher (2023) also found that technology-based learning enhances student engagement by providing flexible access and a more personalised learning experience through active interactions with instructors and peers. This increased engagement ultimately leads to improved learning outcomes. For example, a study on blended learning with animated videos demonstrated a significant improvement in students' understanding of mathematics (Puspaningtyas & Ulfa, 2020). Additionally, Wekerle, Daumiller, and Kollar (2022) found that technology-driven learning activities that actively engage students are more effective than passive learning.

The integration of digital technology in education offers several advantages, including reducing educators' workload. Research suggests that technology facilitates fair grading and feedback while minimising administrative tasks (Huang et al., 2024; Nguyen-Tat et al., 2024), ultimately leading to more efficient teaching (Royle et al., 2024). Additionally, digital training programmes have transformed collaboration among educators by fostering professional learning and knowledge sharing. These programmes help develop learning communities where educators exchange ideas, enhance teaching methods, and design lesson plans across institutions (Mulkerrins et al., 2025). They also provide mentorship, allowing experienced educators to guide newcomers in refining their teaching and research skills (Abdelghaffar & Eid, 2025). Furthermore, technology eliminates geographical barriers, enabling educators to collaborate and create more inclusive learning experiences (Ferencik, 2024). Learning Management Systems (LMS) facilitate real-time collaboration, allowing educators to engage in discussions, provide feedback, and improve lesson delivery (Jacobson-Wright, 2025). Peer-reviewed assessment tools further promote cooperation by enabling both educators and students to review each other's work, fostering a culture of constructive feedback (Koshiry et al., 2025).

As a result, both government and non-government organisations have encouraged educators to develop strong digital competencies to meet educational needs (Dunn & Kennedy, 2019). The rapid and ongoing changes in education, along with the numerous benefits technology offers, have heightened the demand for educators to continuously enhance their knowledge and skills to effectively integrate information technology into their teaching (Hew & Brush, 2007). Munyengabe et al. (2017) asserted that educators must actively and effectively utilise information and communication technology (ICT) in all facets of learning. However, despite these expectations, not all educators are able to keep pace with these demands.

According to Kologrivaya and Shleifer (2022), despite the distribution of over one million laptops through the Digital Literacy Program, only 10% of educators in Kenya were able to use the technology effectively. A survey by ETDP SETA across 26 universities in South Africa also found that 41% of academic staff were unaware of emerging technologies (as cited in Govender & Mpungose, 2022). Howard et al. (2021), in their study of educators from 20 countries, found varying levels of technology readiness, ranging from low to high. In Indonesia, the Ministry of Education and Culture (Kemendikbud, 2018) reported that only 40% of educators were prepared to use technology. The report also noted that 1,420 schools had received internet services, and 10,000 educators were trained annually. However, less than half of these educators were considered ready to integrate technology into their teaching. Liputan6

(Makdori, 2021) further reported that Kemendikbud acknowledged 60% of educators still had limited proficiency in using information technology.

Even though the primary goal of integrating technology is to enhance educational practices, Tarafdar et al. (2007) noted that the constant demand to learn and master new technologies can cause considerable pressure. In practice, the inability to use technology can create stress among educators due to the additional pressure to adapt and develop new technology skills, which increases anxiety and stress (Etuah et al., 2024; Khlaif et al., 2023; Pozo-Rico et al., 2020). This pressure may stem from an increased workload with tight deadlines, high expectations regarding the effective use of Information and Communication Technology (ICT) in teaching, and the requirement for educators to participate in training sessions despite their already demanding responsibilities (Sadiq, 2024; Wang, 2024).

Studies have reported that the pandemic crisis led to increased stress among educators due to a heavier workload and the lack of clear boundaries between personal life and work. The transition to online teaching required them to quickly adapt to new teaching methods, further exacerbating stress levels (MacIntyre et al., 2020; Sokal et al., 2020; Truzoli et al., 2021). While educators generally have a positive attitude toward technology, many still feel anxious about using digital tools in their teaching (Adeyele, 2024). This anxiety is common across different subjects, including mathematics and language courses such as English (Wulantina et al., 2021; Resmini et al., 2021). Furthermore, the constant pressure to engage with online learning platforms contributes to burnout among educators, potentially leading to a sense of isolation that negatively affects their mental well-being and job performance (Matthes, 2020; Tarafdar, 2011; Panisoara et al., 2020). Hakami et al. (2023) add that collaborative learning can sometimes increase stress among educators due to technical difficulties, time consumption, and lack of training.

Consequently, educators who feel they lack sufficient digital skills and knowledge may become reluctant to use technology in the classroom, especially when inadequate institutional support and limited professional training exacerbate these challenges (Makdori, 2021). This situation can trigger technology-induced stress, commonly known as technostress (TS), among educators (Joo et al., 2016). The effects of technostress can lead to reduced productivity, pose health risks, and impair performance (Ayyagari et al., 2011; Fuglseth & Sørebø, 2014; Setyadi & Taruk, 2019; Pradani et al., 2022). Additionally, technostress has been linked to decreased organisational commitment (Ahmad et al., 2014; Odoh et al., 2013) and lower job satisfaction (Jena, 2015; Suh & Lee, 2017).

Technostress has become a growing concern in various professional fields, including education. Technostress refers to the stress individuals experience due to the use of technology. The concept was first introduced by Brod (1984), who defined it as a modern adaptation disorder resulting from an inability to effectively use available computer technology. Lyon (1985, as cited in La Torre et al., 2019) further explained that excessive technology use could diminish individuals' ability to engage in meaningful real-world interactions. Later, Weil and Rosen (1997) described technostress as the negative impact of technology on an individual's attitudes, thoughts, behaviours, or physiological state, either directly or indirectly. Over time, the concept of technostress has evolved. It is now widely recognised as a state of stress and discomfort triggered by the use of information technology (Berger et al., 2016; Tarafdar et al., 2007). In summary, technostress can be understood as a negative consequence of technology use, affecting individuals' psychological, physical, and behavioural well-being (Brod, 1984; Clark & Kalin, 1996; Salanova et al., 2013).

One of the most widely used theoretical models to explain technostress is the Transaction-Based Model of Stress, developed by Lazarus and Folkman (Ragu-Nathan et al., 2008). Lazarus and Folkman (1984) conceptualised stress as a dynamic interaction between individuals and their environments. Building on this, Tarafdar et al. (2007) proposed the Technostress Framework, which categorises Technostress into creators (stressors), antecedents (individual differences), inhibitors (mitigation strategies), and outcomes (effects on both individuals and organisations). These theoretical perspectives provide a structured approach to understanding how educators experience, respond to, and manage technostress in educational settings.

Ragu-Nathan et al. (2008) elaborated that technostress arises from multiple factors, primarily categorised as creators and antecedents. Techno-stressors are the specific parts of technology use that cause stress. Some examples are techno-overload (too much work due to technology), techno-complexity (difficulty understanding new digital tools), techno-invasion (blurring of work-life

boundaries due to constant connectivity), techno-insecurity (fear of losing your job or becoming professionally obsolete due to technological advances), and techno-uncertainty (stress caused by the constant introduction of new technologies, which requires constant adaptation). In contrast, antecedents are the pre-existing individual or contextual factors that influence an educator's susceptibility to technostress, including demographics, digital competence, and self-efficacy (Salanova et al., 2013; Joo et al., 2016).

Technostress inhibitors, on the other hand, help mitigate the negative effects of technostress. These mechanisms enable individuals to manage technology-induced stress and enhance their adaptability to rapid technological changes (Ragu-Nathan et al., 2008). Ragu-Nathan et al. (2008) named three main barriers: literacy facilitation (institutional programs that encourage and support teachers sharing knowledge about technology), technical support provision (efforts to help end-users deal with ICT-related problems), and involvement facilitation (making sure that employees stay informed about why new technologies are being used). By acting as a counterbalance to techno-stressors, inhibitors play a crucial role in reducing workplace stress (Tarafdar, 2011).

The interaction between technological stressors and antecedents leads to various outcomes at both the individual and organisational levels. Ragu-Nathan et al. (2008) explain that the interplay between technostressors, antecedents, and inhibitors results in strain, which encompasses the psychological, cognitive, and behavioural consequences of technology-induced stress. If not properly managed and mitigated by inhibitors, strains can lead to negative outcomes at both the individual and organisational levels. At the individual level, strain may reduce job satisfaction and psychological well-being, while at the organisational level, it can increase turnover intention, lower organisational commitment, and decrease work productivity (Ragu-Nathan et al., 2008).

Through several literature reviews conducted for this systematic literature review (SLR), researchers found that since the introduction of the concept of technostress, numerous studies have explored its causes, consequences, and mitigation strategies. However, research on technostress has predominantly focused on office settings (Shropshire & Kadlec, 2012; Shih et al., 2013; Eckhardt et al., 2016; Sasidharan, 2022), the medical field (Califf, 2022; Kasemy, 2022; Liu et al., 2019), and the banking sector (Owusuh-Ansah, 2016; Shahid & Khalid, 2024; Vijayalakshmi & Arulkumar, 2024). In contrast, studies on technology in education primarily highlight its effectiveness as a learning tool, while the psychological impact of technology on educators remains underexplored and limited.

The limited amount of literature on technostress in the educational sector highlights the urgent need for this literature review. This urgency stems from the fact that technology integration has now become a fundamental necessity for enhancing the quality of the educational process, especially after COVID-19, which has further emphasised the role of technology in education. Researchers have identified several critical research gaps, including the pressing need for a literature review on technostress to explore this phenomenon among educators (Chou & Chou, 2021; Zheng et al., 2024). A literature review conducted by Jain et al. (2024) highlights the necessity of examining the interaction between various technostressors and their relationship with antecedents to gain a deeper understanding of the causes of technostress and its predictive variables. Similarly, a literature review by Ballangan et al. (2024), which discusses technostress across various fields, underscores the need for a more in-depth review of the impact of technostress on specific domains, including education. Furthermore, the literature review by Seberini et al. (2022), which examines the rise of technostress during and after the pandemic, states that it is necessary to write a literature review about technostress among educators to develop effective interventions against its impact. A comprehensive understanding of technostress among teachers is essential for designing effective mitigation strategies. These insights can help teachers develop coping strategies and guide school administrators in crafting policies for digital well-being. School counsellors also play a crucial role by implementing psychosocial support and technology stress interventions. This study is expected to contribute by identifying effective approaches for addressing technostress among educators and shaping future research directions.

Thus, this paper aims to explore the concept of technostress more deeply, particularly in the context of teachers. The following research questions guide the analysis of this Systematic Literature Review (SLR): (1) How does technostress affect educators in educational settings, and what factors contribute to its development? (2) What factors help educators manage or reduce technostress? (3) What is the impact of technostress on educators?

METHOD

This study employs the Systematic Literature Review (SLR) method, which, as defined by Paul et al. (2021), involves systematically collecting, organising, and evaluating existing literature in a specific research field. According to Moher et al. (2010), a systematic review follows a structured and transparent approach to answering a research question by carefully identifying, selecting, and critically assessing relevant studies. This study adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological transparency and standardisation. PRISMA enhances the accuracy, comparability, and reliability of findings by providing a clear framework for conducting systematic reviews (Albhirat et al., 2024).

Procedures

In the data collection process, the researcher utilised the official flowchart published on the PRISMA website, which outlines four steps for filtering the selected articles: identification, screening, eligibility, and inclusion. According to Moher et al. (2010), during the identification stage, researchers identify all relevant articles or studies related to the research topic by searching through selected databases. Next, in the screening stage, researchers conduct an initial review to ensure the articles meet the established criteria. During the eligibility stage, researchers assess whether the articles are suitable for inclusion based on more specific inclusion and exclusion criteria. In the final stage, articles deemed relevant are thoroughly reviewed, while those considered irrelevant are excluded. These steps help researchers identify and select literature that aligns with their objectives in a systematic and organised manner.
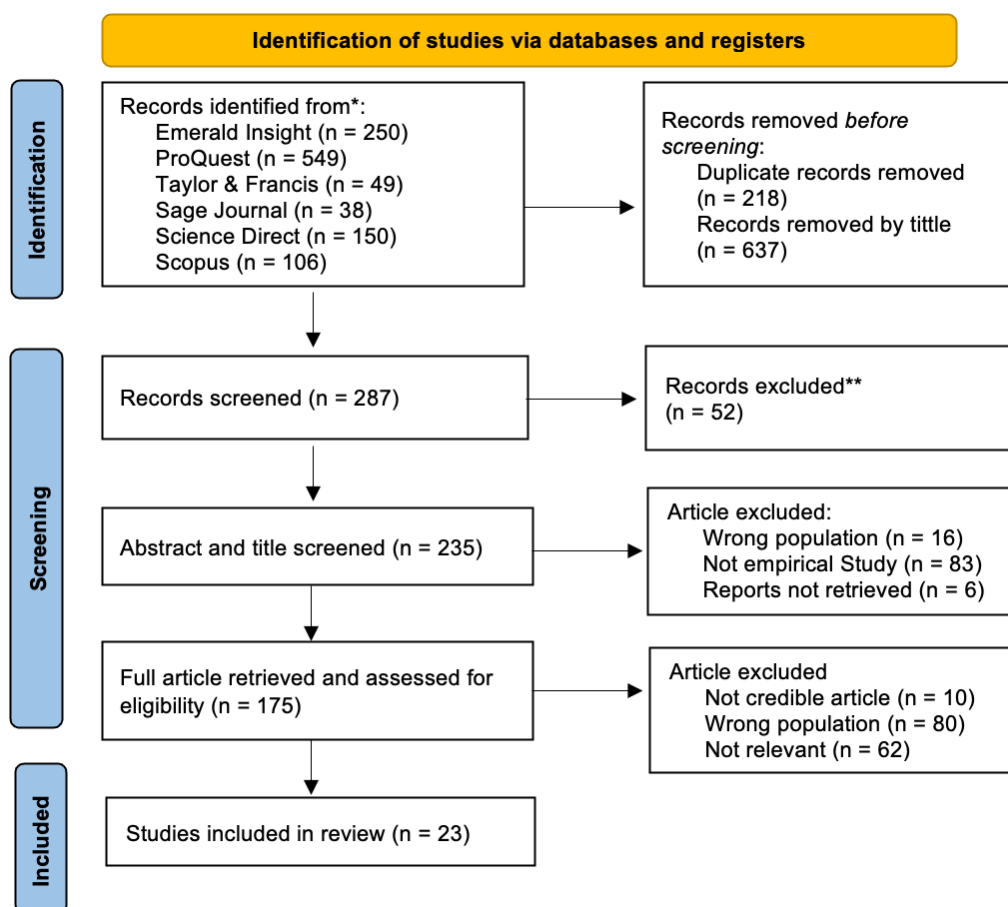

Figure 1. Flowchart PRISMA in Article Selection

Materials

In this study, the reviewers selected several databases with a wide range of research on technostress that were accessible to them, including Emerald Insight, ProQuest, Taylor and Francis, SAGE Journals, ScienceDirect, and Scopus. These databases were selected because they have a broad and relevant scope in the study of technostress in education, include highly reputable journals in the field of education, and cover recent research on technostress, digital workload, and digital education. Only articles published between 2020 and 2025 were included to ensure the use of the most recent findings. We must write the selected articles in English and subject them to scholarly peer review. The search process utilised keywords such as 'technostress AND/OR techno-stressor AND teachers AND/OR lecturers AND/OR educators.

This study applied the following inclusion criteria: first, the selected articles must be empirical studies or primary research. Second, the articles must specifically address technostress among educators. Third, the studies must be published in international, peer-reviewed journals, with full-text availability and written in English. Fourth, the articles must be published between 2020 and 2025. Fifth, the participants in the studies must be educators at any educational level.

The exclusion criteria are as follows: first, articles that are not empirical studies or primary research. Second, articles focusing on technostress among students rather than educators. Third, articles written in languages other than English, published in non-international or non-peer-reviewed journals, or lacking full-text access. Fourth, studies published before 2020. Fifth, studies in which the participants are not educators.

Data Analysis

Figure 1 illustrates the initial retrieval of 1,142 articles from the selected databases, followed by the application of inclusion and exclusion criteria. Based on these criteria, we filtered the articles and deemed 23 eligible for full examination. These selected studies specifically focus on technostress among educators, exploring its contributing factors and the variables influencing its impact. We then used thematic synthesis to analyse the final set of articles.

According to Thomas and Harden (2008), thematic synthesis is a qualitative method commonly used in systematic literature reviews or evidence-based synthesis research. This method aims to identify, categorise, and interpret key themes or patterns in the collected data. Thomas and Harden (2008) further outline that thematic synthesis typically follows three main stages:

1. The process involves free coding of text, which involves identifying and marking recurring concepts or keywords within the text.
2. The process of developing descriptive themes involves grouping the initial keywords based on conceptual or semantic similarities.
3. The process of generating analytical themes involves analysing the relationships between themes to develop new insights.

In this study, we adopted thematic synthesis to categorise the findings into four main themes: techno-stressors, antecedents, inhibitors, and impacts.

RESULTS

As presented in Table 1, the findings from the reviewed literature on technostress among educators have been categorised into four key themes: technostress creators (techno-stressors), individual factors (antecedents), inhibitors, strain & outcomes (as impact), following the theoretical framework proposed by Ragu-Nathan (2008). Each subsection provides a detailed analysis of the factors contributing to technostress, the underlying conditions that influence it, strategies for mitigation, its impact on educators, and the broader consequences within educational settings.

Technostress Creator

Technostress creators, also referred to as techno-stressors, are various technology-related factors, such as stimuli, events, or demands that individuals perceive as potential sources of stress. These factors can induce feelings of tension and pressure associated with technology use. In academic literature, Tarafdar et al. (2007) were the first to identify five distinct types of technostress through a cross-sectional study. These include techno-overload, techno-complexity, techno-invasion, techno-insecurity, and techno-uncertainty. Later, Ragu-Nathan et al. (2008) expanded on these categories by providing a more comprehensive understanding of the nature of techno-stressors, such as:

1. Techno-overload: technology increases work pressure, making employees work faster and handle more tasks than before.
2. Techno-complexity: the fast-changing and complicated nature of technology makes employees feel unprepared and in constant need of learning new skills.
3. Techno-invasion: the need to always stay connected through technology blurs the line between work and personal life, making employees feel their privacy is disrupted.
4. Techno-insecurity: employees worry about losing their jobs due to automation or being replaced by others with better technological skills.
5. Techno-uncertainty: the frequent updates and changes in technology create uncertainty, forcing employees to continuously adjust and learn new systems.

Techno-stressors identified by Tarafdar et al. (2007) have been widely recognised as primary contributors to technology stress among educators across numerous studies. All five of these stressors were found to be contributing factors to technostress among educators (Bou Reslan & El Hokayem, 2023; Boyer-Davis, 2020; Califf & Brooks, 2024; Can-Yalçin et al., 2022; Decataldo & Fiore, 2022; Li & Wang, 2021; Li et al., 2024; Muslimin et al., 2023; Mushtaque et al., 2022; Pace et al., 2022; Pagán-Garbín et al., 2024; Saleem & Malik, 2023; Shaukat et al., 2022; Wang & Yao, 2023; Willermark et al., 2023).

The study conducted by Boyer-Davis (2020) reported an increase in all five factors of technostress among educators following the COVID-19 pandemic. This rise indicates that educators felt pressured to work at a faster pace and handle a greater workload due to technological demands while simultaneously adapting to newly required technologies. Such pressures exacerbated their concerns regarding technological uncertainty, ultimately affecting their balance between personal and professional life. Based on what Bou Reslan and El Hokayem (2023) found, techno-overload was the most common issue among educators (43%), followed by techno-insecurity (38%), techno-invasion (35%), techno-complexity (29%), and techno-uncertainty (7%).

Beyond their teaching responsibilities, educators also experience stress due to the demands of adapting course materials across multiple digital platforms (Califf & Brooks, 2024). Many perceive technology not as a tool for efficiency but as an additional burden (Li et al., 2024). They must master various software applications, update digital content, and manage virtual student interactions (Li & Wang, 2021). Moreover, digital administrative tasks such as grading, learning platform management, and online communication further intensify their workload (Decataldo & Fiore, 2022; Can-Yalçin et al., 2022).

Differences in digital skills among colleagues, along with fears that technology may replace educators' roles, are key contributors to technostress. Those who lack confidence in their digital abilities often worry about falling behind in technological advancements and perceive themselves as less competent than their more tech-savvy peers (Muslimin et al., 2023). This insecurity is further worsened by the growing use of technology in education, leading to uncertainty about their professional future (Pagán-Garbín et al., 2024). As a result, many educators spend additional hours outside their working schedules learning new technologies, which only heightens their stress (Saleem & Malik, 2023).

The rapid evolution of digital systems further intensifies anxiety, particularly because educators are expected to quickly learn and implement new tools with minimal support (Li & Wang, 2021; Saleem & Malik, 2023). Insufficient training increases their reluctance to adopt new technology in their teaching practices (Wang & Yao, 2023). Additionally, technology blurs the boundaries between work and

personal life, as educators remain connected to their jobs beyond working hours, increasing the risk of burnout (Pace et al., 2022; Pagán-Garbín et al., 2024; Shaukat et al., 2022). The expectation to remain available for digital communication after working hours adds further psychological pressure, especially among university lecturers who struggle to separate work and personal time due to constant emails, student messages, and virtual meeting invitations (Saleem & Malik, 2023). Moreover, institutions frequently update or replace digital platforms without prior notice or sufficient training, further escalating educators' stress levels (Willermark et al., 2023).

Antecedents of Technostress

Ragu-Nathan (2008) explains that antecedents are factors that contribute to the development of technostress in individuals. These antecedents shape the extent to which individuals experience technostress by influencing their interaction with technology. Several factors that lead to digital literacy have been found. These include socio-demographic factors (age, gender, and level of education), computer self-efficacy, Technological Pedagogical and Content Knowledge (TPACK), how accessible people think ICT is, and digital literacy.

The research findings on some of these antecedents vary. Some studies indicate that older educators tend to experience higher levels of technostress compared to younger educators (Estrada-Araoz et al., 2023; Özgür, 2020; Pagán-Garbín et al., 2024; Shaukat et al., 2022). However, this is contradicted by the findings of Bou Reslan and El Hokayem (2023), who argue that younger educators experience higher levels of technostress. The study by Estrada-Muñoz et al. (2020) also claimed that there was no significant relation between age and technostress.

The same inconsistency is observed in gender-related findings. Some studies suggest that female educators are more vulnerable to technostress than their male counterparts (Bou Reslan & El Hokayem, 2023; Decataldo & Fiore, 2022; Estrada-Araoz et al., 2023; Shaukat et al., 2022; Solís et al., 2023). However, the study by Estrada-Muñoz et al. (2020) instead suggests that male educators experience higher levels of technostress than female educators. While other studies show no significant difference in technostress levels between male and female educators (Li & Wang, 2021; Özgür, 2020; Pagán-Garbín et al., 2024), an educator's level of education is also considered a potential factor influencing technostress. Studies indicate that educators with a PhD degree tend to experience lower levels of technostress compared to those with lower educational qualifications (Shaukat et al., 2022; Siddiqui et al., 2023; Solís et al., 2023). Other than demographic factors, several other antecedents have been identified. Solís et al. (2023) found that the type of school also influences educators' levels of technostress, explaining that teachers in urban schools experience higher technostress than those in rural schools. Technological Pedagogical and Content Knowledge (TPACK) is also considered a crucial factor in determining the level of technostress among educators (Maipita et al., 2023; Özgür, 2020).

Bou Reslan and El Hokayem (2023) stated that self-efficacy also plays a significant role in influencing educators' technostress. Educators who have higher confidence in using technology tend to experience lower levels of technostress, which is also directly linked to their intention to continue online teaching (Chou & Chou, 2021). This is supported by the findings of Siddiqui et al. (2023), who explain that educators capable of overcoming digital challenges experience lower levels of technostress. Similarly, digital literacy and resilience are also identified as antecedents of technostress. Research findings indicate that educators with sufficient digital literacy (Muslimin et al., 2023) and resilience (Pagán-Garbín, 2024) tend to experience lower levels of technostress.

Another identified antecedent is the way educators perceive the availability of resources, services, or support systems, which also impacts their technostress levels (Decataldo & Fiore, 2022). Having access to adequate resources and support can help reduce the technostress they experience. Lastly, educators with a strong perception of meaningful work are reported to have lower levels of technostress (Pace et al., 2022).

Technostress Inhibitors

Technostress inhibitors are organisational mechanisms designed to mitigate the impact of stress caused by technology use on individuals. In the study conducted by Ragu-Nathan et al. (2008), these

inhibitors function as situational factors that can reduce users' stress levels while enhancing job satisfaction and commitment to their institutions. There are three main factors: (1) literacy facilitation, which means that the company tries to get employees to share their knowledge about technology, which could be done through a training program or workshop; (2) technical support provision, which means that the company directly helps end users with ICT problems by setting up help desks that are easy to reach and have professionals on hand; and (3) involvement facilitation, which means that the company tries to keep users informed about why new technologies are being used.

The findings from the literature review extraction illustrate the three key factors described by Ragu-Nathan et al. (2008). The study by Özgür (2020) explains that support in the form of technical assistance, training, and policies that facilitate technology integration has a significant impact on educators' technostress. This is supported by Li and Wang (2021), who report that involvement facilitation and technical support provision significantly help reduce techno-stressor. However, the same study found that literacy facilitation exacerbates the severity of those who create technostress (Li & Wang, 2021). The study by Chou and Chou (2021) also found that institutional support does not have a direct relationship with technostress. This finding is reinforced by Califf and Brooks (2024), who argue that literacy facilitation is ineffective in reducing workload caused by technology and instead disrupts educators' personal lives by keeping them constantly connected. Therefore, according to Solís et al. (2023), educators' perceptions of institutional support should also be considered. Educators who view institutional support positively tend to experience lower levels of technostress compared to those who perceive it negatively.

Beyond these key factors, several other inhibitors have been identified, such as organisational flexibility. The ability of an institution to efficiently and effectively adapt to changes in both internal and external environments can help mitigate the negative effects of technostress on work-life quality. Additionally, Willermark et al. (2023) highlight another inhibitor in the form of coping mechanisms, specifically problem-focused coping and emotion-focused coping. Problem-focused coping refers to efforts to seek technical support from colleagues or IT staff within the institution, while emotion-focused coping involves adopting a mindset that frames challenges as learning opportunities.

Impact

Ragu-Nathan et al. (2008) explain that technostress can lead to strain, which is defined as the psychological, cognitive, and behavioural consequences experienced by individuals due to prolonged exposure to technology-induced stress. If this strain is not addressed through proper intervention, it can result in negative outcomes and the long-term consequences of technostress at both the individual and organisational levels. Technostress-related strain can manifest as stress, burnout, and anxiety, which ultimately lead to decreased job performance, lower productivity, and reduced intention to continue using online learning (Tarafdar et al., 2007). The literature review identifies several strains and outcomes of technostress, aligning with the proposed framework by Ragu-Nathan et al. (2008).

Research indicates a negative correlation between technological stress and psychological well-being, suggesting that higher technostress levels are linked to increased fatigue, anxiety, scepticism, and ineffectiveness, as well as reduced self-acceptance, autonomy, social relationships, and motivation to achieve professional goals (Estrada-Araoz et al., 2023; Estrada-Muñoz et al., 2020). Exposure to technology-related stress not only affects educators' perception of their own effectiveness but also contributes to severe psychological strain. Studies highlight that technostress is closely linked to burnout, emotional exhaustion, and depersonalisation, with these effects increasing as technostress levels rise (Pagán-Garbín et al., 2024). Additionally, the physiological impact of technostress is evident, as educators experiencing high technostress report symptoms such as insomnia, anxiety, headaches, and screen fatigue due to excessive screen exposure (Govender & Mpungose, 2022; Willermark et al., 2023).

Technostress also has a strong influence on job satisfaction and motivation. Educators who perceive technostress as disruptive to their professional environment often experience lower job satisfaction (Wang & Yao, 2023). The complexity of technology, combined with the constant pressure to adapt to digital tools, leads to frustration and reduced enthusiasm for teaching. Moreover, technostress has been found to diminish the intrinsic pleasure educators derive from their work (Pace et al., 2022), further exacerbating dissatisfaction. Work-life balance is also affected, as excessive technology use

makes it difficult for educators to separate professional responsibilities from personal life. Studies have shown that technostress increases work-family conflict, making it harder for educators to maintain a healthy balance between work and personal obligations (Shaukat et al., 2022; Decataldo & Fiore, 2022).

In terms of professional performance, technostress presents substantial challenges for educators' effectiveness in the classroom. The study by Chou and Chou (2021) shows that technostress has a negative impact on teachers' intention to continue using online learning. This is supported by Muslimin et al. (2023), who explain that lecturers experiencing high levels of technostress tend to use technology only during the initial stages of integration and do not continue its adoption. This lack of continued use in turn affects their teaching performance. Research by Can-Yalçin et al. (2022) highlights that high levels of technostress contribute to organisational cynicism, a phenomenon where educators develop negative attitudes toward their institutions and the broader educational system. This cynicism can diminish their motivation and engagement, ultimately reducing productivity. Furthermore, the complexity and rapid evolution of digital tools create an environment where educators struggle to keep up with technological advancements, leading to a decline in teaching quality (Li & Wang, 2021). Techno-complexity and techno-insecurity have been identified as major contributors to reduced performance among educators. However, in some cases, techno-overload can lead to increased productivity (Li & Wang, 2021). This finding is also supported by Wang and Yao (2023), who state that the relationship between technostress and job satisfaction is influenced by educators' perspectives on technostress itself. If they perceive techno-stressors as challenges, they are more likely to seek technical assistance, which ultimately enhances their job satisfaction. However, if technostress is viewed as a threat, job satisfaction tends to decline, particularly when educators feel overwhelmed by the complexity of technology or when work-related technological demands interfere with their personal lives (Li & Wang, 2021; Wang & Yao, 2023). This inconsistent effect suggests that while technostress can hinder performance, it may also drive efficiency in certain conditions.

Another critical impact of technostress is its role in turnover intention, or educators' inclination to leave the profession. Burnout resulting from technology-related stress significantly increases teachers' desire to resign (Califf & Brooks, 2024). Educators facing ongoing digital challenges, such as difficulties in adapting to online teaching and a lack of adequate technical support, are more likely to consider leaving their profession. The study by Siddiqui et al. (2023) provides empirical support for this trend, demonstrating a statistically significant relationship between technostress and teachers' intent to quit ($\beta = 0.583$, $p < 0.001$). The study by Saleem and Malik (2023) also shows that technostress has a negative impact on educators' quality of work life, which directly affects their job performance.

Table 1. Summary of articles included.

No.	Author(s)	Sample	Findings about Technostress	Relevance to Technostress and Counseling Practice
1.	Bou Reslan & El Hokayem (2023)	379 teachers in Lebanon	Married women with low computer self-efficacy experience higher technostress; Family life is significantly impacted.	Technology training is essential for teachers to enhance their self-efficacy skills and to design strategic educational policies that support educators' well-being, particularly for women.
2.	Boyer-Davis (2020)	307 university professors in U. S	Lecturers experienced higher technostress during the COVID-19 pandemic compared to before. The increased use of ICTs led to role overload and burnout.	Institutions must provide better technical support in terms of training and resources to promote educators' mental well-being.
3.	Califf & Brooks (2024)	392 K-12 educators in the U.S.	Identified five techno-stressors (complexity, insecurity, invasion, overload, uncertainty); Literacy facilitation helps reduce stress.	Enhancing technological literacy can be an effective strategy for mitigating technostress. Schools can develop sustainable professional development programs.

No.	Author(s)	Sample	Findings about Technostress	Relevance to Technostress and Counseling Practice
4.	Can-Yalçin et al. (2022)	237 teachers in Malatya, Turkey	Technostress negatively impacts job performance; organizational cynicism mediates this relationship.	Teachers experiencing organizational cynicism due to technostress require psychological intervention.
5.	Chou & Chou (2021)	488 teachers in Taiwan	Privacy concerns, self-efficacy, and school support influence technostress and willingness to continue online teaching.	Institutions should offer technical support and policies that reduce teachers' workload while also providing emotional support for teachers.
6.	Decataldo & Fiore (2022)	481 university lecturers in Milan Bicocca, Italy	Techno-insecurity and techno-overload impact work-family balance; Gender and family status influence stress levels.	Psychosocial support is needed for lecturers to reduce stress caused by excessive digital connectivity
7.	Estrada-Araoz et al. (2023)	169 teachers in Peru	Technostress negatively correlated with psychological well-being; significant inverse relationships with anxiety, inefficacy, and fatigue.	Programs promoting healthier technology use, such as implementing digital disconnection and psychological counseling interventions, are essential to help teachers manage technostress.
8.	Estrada-Muñoz et al. (2020)	428 primary and secondary teachers in Chile	12% experience techno-fatigue, 13% experience techno-anxiety; male teachers report higher technostress levels.	Institutions must provide technical support, flexible policies, and psychological interventions to mitigate technology-induced stress.
9.	Govender & Mpungose (2022)	13 lecturers from South African	Identified significant technostress among lecturers due to unpreparedness for online teaching	Lecturers need counseling programs to develop coping strategies and receive emotional support.
10.	Li & Wang (2021)	312 university lecturers in China	Techno-insecurity and techno-complexity reduce work performance; literacy facilitation can both inhibit and create technostress.	Institutions should establish programs to support the enhancement of lecturers' digital literacy.
11.	Li et al. (2024)	500 Teachers in Hunan, China	Identified five technostress factors including new technology adoption; Clustered teachers into five groups.	Emphasizing the need for support for teachers in coping with technostress through the development of more targeted technology training programs.
12.	Maipita et al (2023)	419 pre-service teachers in Indonesia	Technostress exists but does not critically impact teacher performance; organizational support and TPACK are key predictors.	Programs for managing technostress, such as coping strategies and teacher well-being programs, must be developed.
13.	Mushtaque et al. (2022)	260 educators in Pakistan	Technostress negatively impacts willingness to use online teaching; job insecurity worsens this effect.	Training and technical support are essential to reducing technostress.
14.	Muslimin et al. (2023)	18 EFL lecturers in Indonesia	Strong negative correlation between digital literacy competence and technostress; minimal tech use in EFL teaching.	Digital literacy training and programs aimed at reducing technostress are necessary.

No.	Author(s)	Sample	Findings about Technostress	Relevance to Technostress and Counseling Practice
15.	Özgür (2020)	349 high school teachers in Turkey	Higher school support and TPACK knowledge reduce technostress; lack of tech skills increases it.	Institutions are expected to provide technostress reduction programs, such as TPACK training and enhanced collaboration initiatives
16.	Pace et al. (2022)	219 teachers in Italy	Technostress reduces work-related well-being; meaningful work perceptions can alleviate this stress.	Institutions must provide a platform for teachers to enhance their perception of work meaning, which can serve as a mitigation strategy for technostress.
17.	Pagán-Garbín et al. (2024)	168 teachers in Murcia, Spain	Technostress is linked to burnout; resilience is a key factor in reducing technostress.	Programs or training to strengthen teachers' resilience need to be developed.
18.	Saleem & Malik (2023)	199 university teachers in Pakistan	Techno-overload, complexity, and invasion reduce quality of work life; organizational flexibility moderates these effects.	Educational institutions should establish policies that enhance work flexibility to improve lecturers' quality of work life.
19.	Shaukat et al. (2022)	292 educators in Pakistan	Technostress positively correlates with work-family conflict and life satisfaction; gender differences found in technostress levels.	Policies supporting work-life balance for lecturers and the provision of psychological support are needed to mitigate the impact of technostress.
20.	Siddiqui et al. (2023)	242 teachers in Pakistan	Technostress contributes to motivation to leave the teaching profession; self-efficacy in technology use mitigates stress.	Training is required to enhance teachers' self-efficacy, along with technology training programs and mental well-being initiatives to prevent burnout and turnover.
21.	Solís et al. (2023)	711 teachers in Spain	Higher perceived organizational support reduces technostress; private school teachers reported higher support.	Schools must consider better organizational support and develop strategies to address technostress.
22.	Wang & Yao (2023)	304 teachers in China	Technostress creators impact job satisfaction: technical help-seeking mediates stress effects.	Teachers need training in coping strategies and technical support to help them manage technostress effectively.
23.	Willermark et al. (2023)	286 teachers in Swedish	Technostress strains were identified during rapid digitalization; coping strategies included 'techno-shields' and 'techno-security'.	A more flexible approach to technology adoption is needed to balance the benefits of digitalization and technostress through effective management.

DISCUSSION

The findings of this systematic literature review (SLR) provide a more comprehensive understanding of how technostress works. Technostress is not an isolated phenomenon but rather the result of a complex interplay between multiple factors. These factors include the causes of the stress (creators), individual characteristics that shape how they respond to stress (antecedents), and institutional support mechanisms that can mitigate the negative effects of technostress (inhibitors). The dynamic interaction of these elements directly influences the level of stress experienced by educators and their ability to adapt to technological changes.

Techno-stressors as the Primary Triggers

Technostress in the educational context is a phenomenon that arises from the challenges educators face in adapting to technology in the learning process. The findings from this literature review indicate that the techno-stressors model proposed by Ragu-Nathan et al. (2008) is the most frequently referenced framework in technostress research. This model identifies five main types of techno-stressors: techno-overload (more work to do because of technology), techno-complexity (hard time understanding new technology systems), techno-invasion (work-life boundaries being broken by constant digital connectivity), techno-insecurity (fear of losing a job because of technological advances), and techno-uncertainty (anxiety caused by frequent changes and updates to technology). This framework primarily focuses on how technology directly induces stress in individuals within the workplace.

This literature review agrees with other research that shows that the lack of clear boundaries between work and personal life caused by technological invasion is a major cause of anxiety, burnout, and job dissatisfaction (Gaudioso et al., 2017; Ragu-Nathan et al., 2008). The persistent expectation for educators to remain digitally connected beyond working hours—whether through emails, online platforms, or virtual communication—diminishes personal time and heightens emotional exhaustion. Some studies have also shown that adding technology to the classroom, which is meant to make teaching more effective, often makes things harder because teachers have to change lesson plans, fix technical problems, and keep track of many digital tools at once, which makes things more stressful (Hassan et al., 2019; Wang et al., 2024; Wang et al., 2020). In addition, techno-complexity and techno-insecurity have been found to play a significant role in shaping educators' technostress, as rapid technological advancements demand continuous adaptation, leaving many educators feeling overwhelmed or inadequately prepared. This directly affects the effectiveness of classroom management, where difficulties in navigating new systems can disrupt the learning process and reduce teaching efficiency (Amin et al., 2024; Çar et al., 2022; Q. Wang et al., 2024). Also, techno-uncertainty makes things even more stressful because new technologies are often updated and digital platforms are added without enough training or time to get used to them (Ariani et al., 2022). This makes it harder for teachers to keep up with all the changes.

Research on technostress among educators in Indonesia indicates that the primary triggers of this condition include infrastructure disparities, unequal access to technology, and inadequate training for educators. A study by Wahyuni & Kurniawati (2021) revealed that the COVID-19 pandemic increased the demand for technology use, exacerbating technostress among educators. They were required to complete more tasks in a shorter period while simultaneously adapting to new technologies without the necessary support (Magistra et al., 2021; Mudrikah et al., 2022). In addition, research by Bestiara, Cahyanda, & Sugiarto (2021) found that educators experience technostress due to unhealthy technology use and increased usage intensity. This issue is further aggravated by technological infrastructure limitations across various regions in Indonesia, leading to unequal internet access and inadequate software, which often results in technical failures and system incompatibilities (Andriono, 2024; Pradani et al., 2022). Situmorang (2020) emphasised that the use of technology without adequate support can overwhelm educators and heighten stress levels, particularly in areas with limited resources.

However, findings from this literature review also indicate that institutional support does not have a direct correlation with technostress (Califf & Brooks, 2024; Chou & Chou, 2021). Some studies highlight that institutional technical support can significantly assist educators in adapting to technology. Nevertheless, policymakers also need to play a role in implementing appropriate policies that do not place excessive burdens on educators (Drossel et al., 2017; Eickelmann et al., 2017; Porter & Graham, 2016). Joo et al. (2016) stressed that a lack of training, infrastructure, and adequate policies can further discourage educators from continuing to use technology in the classroom. Lam et al. (2010) also stated that educators are more likely to integrate technology into their teaching if they feel that school support enhances their competence and autonomy.

Furthermore, other studies have also highlighted that social support among educators plays a significant role in reducing stress caused by an increased workload (Dong et al., 2020; Joo et al., 2016; Li & Wang, 2021; Özgür, 2020). Research by Sadaf & Johnson (2017) found that social support is positively associated with educators' intention to continue integrating technology in the classroom. This finding aligns with previous studies, which suggest that educators are more likely to integrate technology

into their teaching when various forms of technical and social support are available (Khlaif, 2018; Porter & Graham, 2016; Sadaf & Johnson, 2017; Scherer et al., 2021). This explains why educators in private schools experience lower levels of technostress, as they receive adequate and sufficient institutional support. (Solís et al. 2023). Therefore, it is crucial for stakeholders in the education sector to provide adequate technical and social support while also developing policies that consider educators' well-being. This approach can help minimise technostress and enhance the effectiveness of technology-based learning.

Misfit in Technostress Variables

It is also believed that socio-demographic factors significantly influence how much educators experience technostress. This literature review identifies factors such as age, gender, education level, teaching experience, and digital competencies as being associated with variations in technostress levels among individuals. However, findings on these socio-demographic influences are not always consistent. Some studies suggest that older educators tend to experience higher levels of technostress due to lower adaptability to technology compared to their younger counterparts (Estrada-Muñoz et al., 2020; Özgür, 2020; Pagán-Garbín et al., 2024; Shaukat et al., 2022). However, other research indicates that younger educators also face high levels of stress due to technological demands (Bou Reslan & El Hokayem, 2023). Conversely, some studies have found no significant relationship between age and technostress (Estrada-Araoz et al., 2023).

Similarly, findings on gender differences in technostress are mixed. Some studies suggest that female educators experience technostress more frequently than their male colleagues (Bou Reslan & El Hokayem, 2023; Decataldo & Fiore, 2022; Estrada-Araoz et al., 2023; Solís et al., 2023). However, Estrada-Muñoz et al. (2020) argue the opposite, claiming that male educators experience higher levels of technostress. Meanwhile, several other studies report that gender does not have a significant influence on technostress (Li & Wang, 2021; Özgür, 2020; Pagán-Garbín et al., 2024).

The inconsistency in these findings suggests that socio-demographic factors are not the sole variables influencing educators' technostress. Instead, internal factors such as resilience, self-efficacy, digital competence, and Technological Pedagogical Content Knowledge (TPACK) also play a significant role (Bou Reslan & El Hokayem, 2023; Maipita et al., 2023; Muslimin et al., 2023; Özgür, 2020; Pagán-Garbín et al., 2024).

Qi (2019) explains that stress often arises due to a misfit between job demands and an individual's competencies. In their study, Tarafdar et al. (2015) found that computer self-efficacy is significantly associated with technostress among technology users in the workplace. This is further supported by Scherer et al. (2021), who explain that educators with high self-efficacy are better prepared for online teaching. Additionally, Tondeur et al. (2019) reported that educators with strong computer self-efficacy achieve higher success rates in integrating technology into their classrooms. Sokal et al. (2020) also found that educators who feel confident in delivering engaging online instruction tend to experience lower levels of technostress. Previous studies further suggest that teachers with high self-efficacy are more likely to continue using technology-based teaching methods (Kwon et al., 2019; Petko et al., 2018). Resilience has also been found to have a positive relationship with educators' intention to continue online teaching. Lassri (2023) explains that teachers' efforts to overcome challenges when using technology contribute to their overall well-being, which in turn enhances the quality of their teaching.

Furthermore, digital literacy and TPACK have been shown to have a significant relationship with technostress. Zeng et al. (2022) reported that many educators struggle to integrate technology effectively into their teaching materials due to low levels of digital literacy and TPACK. This finding is supported by Muslimin et al. (2023), who found that educators in Indonesia tend to have stronger content knowledge and pedagogical knowledge than technological knowledge, making it difficult for them to incorporate digital media into the classroom. Özgür (2020) also emphasises that educators' technological competence and skills are key factors in determining stress levels associated with information and communication technology use. This discussion is reinforced by previous studies, which suggest that enhancing educators' TPACK and digital literacy can reduce stress related to the use of technological tools in the teaching and learning process (Dong et al., 2020; Joo et al., 2016). The

differences in individual factors among educators will have varying impacts on their levels of technostress.

Mitigating Technostress

A significant finding from this SLR highlights the essential role of technostress inhibitors—both organisational and personal support systems— that help mitigate the impact of technology-related stress on educators. Ragu-Nathan et al. (2008) say that institutional efforts like training (literacy facilitation), responsive technology assistance (technical support), and letting teachers have a say in technology decisions (involvement facilitation) are good ways to stop people from using technology. These support systems serve to reduce educators' stress levels while enhancing their job satisfaction and commitment (Jain et al., 2024; Seberini et al., 2022).

Our review found that several studies support this idea, showing that strong school support can greatly reduce technostress. For example, offering enough technical support, regular training, and clear guidelines on technology use has been shown to significantly lower teachers' stress in various situations (Chou & Chou, 2021; Wang et al., 2024). Li and Wang (2021) observed that when schools kept educators informed and supported during new technology implementations (high involvement facilitation), technostress was mitigated, leading to lower stress levels. Li and Wang (2021) found that when schools kept teachers well-informed and provided support during the introduction of new technology, technostress decreased, resulting in lower stress levels.

These findings align with a common pattern in research: strong institutional support and resources help protect educators from technostress, while a lack of support increases their risk of experiencing it (Pagán-Garbín et al., 2024). Previous studies have identified inadequate school support as a major cause of technostress (Qi, 2019), whereas sufficient support can help reduce its effects. A recent study on primary teachers in China confirmed this, showing that when educators felt well-supported by their schools, the negative impact of heavy technology use on work–life balance and mental health was significantly reduced (Zheng et al., 2023). In other words, teachers working in supportive school environments faced fewer disruptions in their personal lives and reported better overall well-being compared to those in schools with minimal support.

However, this SLR also emphasises that not all forms of support are equally effective, highlighting the importance of quality and proper implementation. Some studies indicate that poorly designed support programmes can have unintended negative effects. For example, basic IT training sessions without practical application may increase technostress if teachers see them as an additional burden (Califf & Brooks, 2023). Moreover, Chou and Chou (2021) found that surface-level institutional support alone did not significantly reduce stress. Solís et al. (2023) highlighted that teachers' perceptions of school support play a crucial role in their stress levels; educators who viewed school policies and IT training as genuinely helpful experienced lower technostress, while those who found them ineffective or overly bureaucratic continued to struggle. This underscores that effective support must be responsive to teachers' actual needs rather than just fulfilling administrative requirements.

The Role of Counseling Practices in Mitigating Technostress

Beyond institutional support, our review highlights the role of counselling and psychosocial support practices as inhibitors that mitigate technological stress and improve educator well-being. Several studies explicitly call for mental health and counselling interventions to help teachers cope with technological pressures. For example, Estrada-Araoz et al. (2023) found that technostress was inversely related to teachers' psychological well-being, with higher technostress correlating to greater anxiety, fatigue, and feelings of inefficacy. They concluded that programs promoting healthy technology use, such as enforced digital disconnection periods and psychological counselling interventions, are essential to helping teachers manage technological stress. Estrada-Muñoz et al. (2020) also emphasise that schools should provide not just technical support and flexible IT policies but also psychological interventions to alleviate technology-related stress.

A qualitative study of South African lecturers by Govender and Mpungose (2022) revealed that educators themselves recognised the need for counselling programmes to help them develop coping

strategies and receive emotional support, especially during the rapid transition to online teaching. Their results agree with those of other studies that have linked technostress to problems between work and family and burnout. This shows how important it is to offer counselling services and programs that help people balance their work and personal lives (Hassan et al., 2019; Tondeur et al., 2019). Effectively, addressing technostress involves more than just technical solutions; it also requires human-centred support aimed at enhancing educators' emotional resilience and stress management skills.

Counselling practices offer concrete mechanisms for relieving technostress. School counsellors and related support staff can deliver interventions that bolster teachers' capacity to cope with stress. These interventions can take multiple forms, including:

1. Stress Management Training, like mindfulness-based stress reduction (MBSR) and cognitive-behavioural therapy (CBT) have been found to be effective in reducing technostress among educators (Wang et al., 2024). Workshops on mindfulness, relaxation, and time-management help educators develop healthier responses to digital overload.
2. Emotional and Peer Support Networks. Teachers benefit from structured peer support networks where they can discuss challenges and share coping strategies (Qi, 2019). Schools can integrate group counselling sessions where educators explore ways to navigate the pressures of digital teaching.
3. Digital Well-being Plans and Work-Life Boundaries. Counselling professionals can assist educators in creating personalized digital well-being plans, which may include strategies such as setting boundaries for after-hours emails, engaging in "screen-free" time, and prioritizing self-care to counteract the psychological burden of constant connectivity (Jain et al., 2024).

Implications

The implications of this systematic literature review (SLR) on technostress in educators highlight the significant psychological and professional challenges posed by the increasing integration of technology in education. Key stressors such as techno-overload, techno-complexity, techno-invasion, techno-insecurity, and techno-uncertainty are identified as major contributors to technostress, affecting educators' mental health, job satisfaction, and teaching efficiency. These stressors are intensified by inadequate training, insufficient institutional support, and technological infrastructure limitations. The findings underscore the importance of addressing these issues through targeted interventions.

Policymakers should create policies that support teacher well-being alongside technology use. This includes setting limits on after-hours communication, funding ICT training, and ensuring schools provide mental health resources. Strong policies can create a better digital work environment for educators. Educational institutions must also take steps to reduce technostress. Schools and universities should offer professional development to improve teachers' digital skills and provide ongoing technical support. Clear policies, such as designated "offline" times and reasonable limits on digital workload, can help maintain a healthy work-life balance.

Educators can also take steps to manage their own technostress. Improving digital skills, setting boundaries for after-hours emails, and taking breaks from screens can help reduce stress. Joining peer support groups allows teachers to share experiences and coping strategies. Using available counselling services can also help educators build resilience and protect their mental well-being. School counsellors and support staff play a key role in helping teachers cope with technostress. They should offer individual or group counselling, stress management workshops, and mindfulness training. Counsellors can also advocate for flexible schedules, balanced workloads, and easy access to mental health support. Creating safe spaces where teachers can discuss their challenges and seek peer support can help reduce feelings of isolation. By working together at the policy, institutional, individual, and support levels, schools can create a healthier digital work environment for educators. This approach ensures that technology enhances teaching and learning without harming teachers' well-being.

Limitations

There are several limitations to this study. First, the review only looked at articles published between 2020 and 2025. This made sure that the studies were relevant, but it may have left out early studies that gave us important information about technostress. As a result, historical perspectives and long-term trends in technostress among educators may not have been fully captured. Second, this study does not explore variations in technostress based on institutional settings. Technostress is likely to manifest differently in public versus private institutions, urban versus rural schools, and technologically advanced versus resource-limited environments. These contextual factors could significantly influence how educators experience and cope with technostress. Future research should adopt comparative studies to assess these differences in detail. Furthermore, research could be enriched through the implementation of practical interventions, such as professional development programmes and wellness initiatives, designed to reduce technostress and improve educators' overall well-being. Lastly, future studies can explore the role of institutional policies and support systems in mitigating technostress, examining how these policies can be tailored to meet the unique needs of educators in both developed and developing countries.

CONCLUSION

This systematic review confirms that technostress has become a serious concern for educators in the post-COVID-19 educational landscape. While the rapid adoption of digital tools has enabled new forms of teaching and learning, it has simultaneously introduced significant challenges for teachers. Our findings show that educators commonly experience heavy workloads from managing online platforms, difficulties with constantly evolving technological tools, blurred boundaries between work and personal life, and even feelings of insecurity about their jobs or skills due to continuous system changes. These issues are often worsened when teachers lack sufficient digital skills training, receive inadequate technical support, or work in environments without strong institutional backing, making it difficult for them to adapt to the intensified digital demands.

Importantly, the review highlights that personal and professional factors influence how well educators cope with technostress. We observed that basic sociodemographic variables (such as age or gender) alone do not explain differences in stress levels. Instead, an educator's confidence with technology, resilience, and specialised knowledge (like Technological Pedagogical Content Knowledge or TPACK) are more decisive in determining their ability to handle digital pressures. Educators who have higher self-efficacy and better training tend to manage technostress more effectively, whereas those who feel unprepared or unsupported are more prone to burnout, anxiety, and declines in teaching performance. If targeted solutions are not implemented, the ongoing digital changes in education could further increase stress levels, adversely affecting educators' well-being and job satisfaction.

To address these challenges, educational institutions need to make comprehensive changes that go beyond merely adding technology to classrooms. Schools should focus on providing structured and continuous professional development, setting clear boundaries for digital work hours, and offering immediate technical assistance to ensure technology does not add to stress. Additionally, school counsellors should actively help manage the psychological effects of technostress by providing stress management programmes and peer support initiatives.

Looking ahead, it is crucial for policymakers, administrators, and researchers to create well-rounded solutions that harmonise technological progress with the well-being of educators. Without these efforts, technostress will continue to hinder effective teaching and sustainable digital transformation in education. This study's synthesis of recent research underscores the importance of balancing technological innovation with educator well-being. Technostress is a multifaceted problem that, if left unaddressed, can undermine teaching effectiveness and the sustainability of digital integration in schools. By illuminating the key stressors and factors at play, our review provides a foundation for understanding and ultimately alleviating technostress, ensuring that advances in educational technology do not come at the expense of teacher health and productivity.

ACKNOWLEDGEMENTS

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