DOI: 10.53469/jerp.2025.07(05).01

Technostress Among Graduate Students in the Post-COVID-19 Era

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Abstract: ***The COVID-19 pandemic has significantly transformed the educational landscape, forcing graduate students to rapidly adapt to online learning. This transition has led to the emergence of technostress—stress caused by excessive use of technology. Graduate students, already burdened by academic and research responsibilities, face challenges such as digital platform overload, virtual communication fatigue, information overload, time management difficulties, and increased performance pressure. The consequences of technostress include mental health issues, reduced productivity, and physical health problems. This article explores the causes and consequences of technostress in graduate students and discusses potential strategies to mitigate its impact in the post-COVID era.***

Keywords: Technostress, post covid era, graduate students

1. Introduction

The COVID-19 pandemic essentially converted the educational landscape worldwide, forcing institutions to rapidly adapt to online learning models. Before the pandemic, graduate students thrived in traditional, in-person academic settings, where they could engage directly with professors and peers, work in labs, and collaborate on research projects. But when COVID-19 hit, everything changed, and students were suddenly pushed into a fully virtual world. Graduate programs, which had relied on face-to-face interactions, quickly had to move to online platforms. This shift forced students to use new digital tools, navigate virtual classrooms, and communicate through unfamiliar online channels. For many graduate students, who had become accustomed to in-person discussions and mentorship, this sudden change was overwhelming. The move to remote learning made it harder to build strong academic relationships and receive the immediate feedback from professors and classmates that they were used to.

In addition, the technological requirements of online learning placed an added burden on graduate students, many of whom were already juggling demanding coursework, research, and teaching responsibilities. The increased dependence on virtual platforms such as Zoom, Microsoft Teams, and Google Meet, as well as academic management systems, created new layers of complexity and stress. Graduate students were expected to master multiple software programs simultaneously, all while managing their own research projects, coursework deadlines, and in some cases, the added pressures of teaching or working as teaching assistants. This rapid transition left many feeling unprepared and ill-equipped, especially those who were not well-versed in using certain technologies.

As the world moves toward a "new normal, " these students are not only grappling with the impact of the pandemic but are also contending with an evolving educational experience defined by constant connectivity, digital distractions, and the pressure to adapt to an ever-changing technological environment. In this new reality, graduate students are facing a unique and multifaceted form of stress—**technostress**. This form of stress, born out of the challenges of using technology to engage in academic work, research, and communication, has become one of the most pervasive issues for students in the post-COVID era. The digital divide, information overload, and constant virtual presence have exacerbated the sense of burnout, mental fatigue, and anxiety. This article delves deeper into the emergence of technostress among graduate students, exploring its causes, consequences, and the strategies that can be employed to mitigate its impact

The COVID-19 pandemic fundamentally altered the educational landscape worldwide, forcing institutions to rapidly adapt to online learning models. Graduate students, typically accustomed to in-person interactions, found themselves navigating the complex world of virtual platforms, digital tools, and remote communication. As the world shifts toward a "new normal, " these students are facing a new set of challenges – specifically technostress. This article explores the emergence of technostress in graduate students in the post-COVID era, its causes, consequences, and potential solutions.

1.1 What is Technostress?

Technostress is a term coined by clinical psychologist *Craig Brod* in the early 1980s to describe the negative psychological and physical effects caused by the constant exposure to and use of technology. Initially, the focus was primarily on the stress experienced by individuals due to the rapid advances in information technology, especially computers. However, as digital tools expanded to all areas of work and life, the scope of technostress broadened to include the effects of smartphones, social media, artificial intelligence, and online communication platforms.

Technostress refers to the negative psychological and physical effects resulting from the excessive use of technology, or the inability to adapt to new technologies. This phenomenon has gained prominence in recent years, particularly due to the rapid proliferation of digital tools in academic and professional environments. While technology brings numerous benefits, it also introduces stressors such as information overload, constant connectivity, and difficulty managing the pace of technological change.

1.2 Technostress in the Pre-and Post-COVID Context

Before the pandemic, technostress was already a concern among professionals and students. However, the transition to online education during COVID-19 exacerbated these issues. Graduate students, who typically juggle academic responsibilities, research, and teaching assistant roles, were suddenly required to master various digital platforms. Virtual classrooms, video conferencing, and collaborative tools became the new norm, with little preparation or support to navigate these changes. This shift not only intensified the prevalence of technostress but also changed the nature of it.

1.3 Technostress Causes Post – COVID

1) Overload of Digital Platforms

One of the main causes of technostress in graduate students is the overwhelming number of digital platforms they must use. From learning management systems (LMS) like Canvas and Blackboard to communication tools like Zoom, Microsoft Teams, and Slack, the sheer variety of platforms required for assignments, communication, and meetings can be exhausting. Students often struggle to manage multiple logins, track notifications, and meet deadlines spread across different systems.

2) Virtual Communication Fatigue

Video conferencing became a primary mode of communication during the pandemic, and while it helped maintain academic engagement, it also led to "Zoom fatigue. " Graduate students find themselves spending long hours in virtual meetings or discussions, which can lead to burnout. The lack of physical presence and body language cues, the pressure to remain engaged, and the mental strain of maintaining focus can all contribute to stress.

3) Information Overload

The constant influx of emails, messages, lectures, and digital resources in online learning environments can overwhelm students. The need to absorb large volumes of information quickly and the pressure to respond to emails and discussion posts promptly can result in cognitive overload. Graduate students are particularly vulnerable to this because they often juggle multiple responsibilities such as research, coursework, and professional development.

4) Difficulty in Time Management and Self – Regulation

Online learning requires a higher degree of self-discipline and time management. Graduate students are often expected to independently manage their schedules, prioritize tasks, and meet deadlines without direct supervision. For many, the lack of structured routines and the blurring of boundaries between work and personal life lead to stress and anxiety. Procrastination, a common issue in the digital age, exacerbates this challenge.

5) Increased Expectations and Pressure to Perform

The post-COVID era has seen an increase in academic and career expectations. With the transition to digital platforms, students are expected to demonstrate proficiency with a range of digital tools. Graduate students, already under pressure to excel academically, now face the added stress of mastering new technologies while maintaining their academic and research productivity.

1.4 Consequences of Technostress on Graduate Students

1) Mental Health Struggles

Technostress is strongly linked to mental health issues such as anxiety, depression, and burnout. Graduate students already face high levels of stress due to the demanding nature of their work. The added burden of adapting to technology, constant connectivity, and the overwhelming amount of digital content can exacerbate these issues. Chronic stress can lead to feelings of isolation, frustration, and a sense of being overwhelmed.

2) Reduced Productivity and Performance

Ironically, while technology is designed to increase productivity, it can have the opposite effect when it leads to stress. Graduate students who experience technostress may struggle to focus, retain information, and produce quality work. Research and writing, which require deep focus and attention, can suffer due to the distraction of constant digital notifications, multitasking, and fatigue.

3) Physical Health Issues

The prolonged use of digital devices can result in physical health problems. Students may experience eye strain, headaches, poor posture, and disrupted sleep due to extended hours in front of screens. The lack of physical movement, as well as the sedentary nature of online learning, can lead to musculoskeletal discomfort and exacerbate stress-related physical symptoms.

4) Impaired Social and Academic Relationships

Graduate students often rely on collaboration and networking for academic success. However, the lack of face-to-face interactions in the post-COVID era can strain social and academic relationships. Technostress can lead to feelings of disconnection, loneliness, and difficulty building rapport with peers and professors. These challenges are particularly relevant in research settings, where collaboration is essential.

1.5 Technostress can manifest in several forms:

1) **Technophobia**: Fear or anxiety about using new technology or fear of making mistakes when using it.
2) **Information Overload**: The constant bombardment of data, notifications, and information, leading to cognitive overload.
3) **Constant Connectivity**: The expectation to be always available and responsive due to smartphones, email, and messaging apps.
4) **Role Overload**: The feeling of being overburdened by technology that demands multitasking and managing several responsibilities at once (like social media, email, academic platforms).

1.6 Why Does Technostress Occur?

1) The Speed of Technological Change

The pace at which technology evolves contributes significantly to technostress. Graduate students, for instance, often face the challenge of learning and adapting to new tools

and platforms as they arise. These changes, whether in research tools, data management software, or communication platforms, demand significant cognitive effort and can be overwhelming, especially when there is insufficient training or time to adapt.

2) The Demand for Constant Connectivity

The digital age has blurred the lines between work and personal life, with people, especially students, always "on. " The proliferation of mobile technology has created an environment where students feel compelled to check emails, respond to messages, and attend online meetings at all hours of the day. This constant connectivity can erode the work-life balance and lead to burnout.

3) Information Overload and Digital Distractions

Graduate students, in particular, experience a flood of information daily. They must manage an array of sources—academic journals, lecture notes, online forums, emails, and other digital content—all while trying to focus on their studies. This continuous influx of digital information can overwhelm the brain's capacity to process it all, leading to cognitive fatigue. Moreover, digital distractions, like social media, can impede concentration and productivity, further contributing to stress.

4) Lack of Face-to-Face Interaction

Technostress is exacerbated by the replacement of face-to-face interactions with digital ones. For graduate students, this means less opportunities for informal discussions, mentorship, and collaboration that happen naturally in physical spaces. Video conferencing can be a poor substitute for these interactions, leading to feelings of isolation and disengagement.

1.7 The Impact of Technostress

1) Cognitive and Emotional Strain

Technostress has been linked to a variety of cognitive issues, including difficulty focusing, trouble retaining information, and mental fatigue. Students can feel overwhelmed by the need to constantly engage with new technologies or multitask across different digital platforms. Over time, this can lead to burnout, anxiety, and a sense of diminished self-efficacy.

Research has shown that prolonged exposure to technology without adequate breaks or boundaries can increase stress levels, which in turn can affect academic performance. When students are stressed, their ability to process and recall information diminishes, which affects their learning outcomes and overall productivity.

2) Physical Health Problems

Excessive screen time, particularly when combined with poor posture, can lead to physical discomforts. Many students experience eye strain (often referred to as "computer vision syndrome"), headaches, back pain, and sleep disturbances due to prolonged use of digital devices. Furthermore, the sedentary nature of online learning and working from home increases the risk of musculoskeletal issues and may contribute to a lack of physical activity, further impacting health.

3) Social and Relational Consequences

Technostress can create a feeling of disconnection, especially among graduate students who thrive on collaboration. The lack of in-person social interactions in academic settings can lead to feelings of loneliness and isolation. This can weaken academic relationships and reduce opportunities for peer support, which is crucial during graduate studies. The inability to read body language or engage in spontaneous discussions during virtual meetings can create an emotionally distant learning environment.

4) Decreased Productivity and Academic Performance

While technology is designed to increase efficiency, it can have the opposite effect if it leads to constant interruptions and stress. When graduate students experience technostress, they may find it difficult to maintain concentration for extended periods, leading to decreased productivity. The pressure to respond to messages, complete online assignments, and participate in virtual seminars may also create a sense of constant urgency, which diminishes the quality of work.

5) Mental Health and Emotional Well – being

The pressure to keep up with technology, meet academic deadlines, and stay connected online can lead to anxiety, stress, and feelings of inadequacy. Studies have shown that tech-induced stress is strongly correlated with symptoms of depression and anxiety, particularly among students. Additionally, the expectation to be constantly engaged with digital tools can lead to emotional exhaustion, making students feel overwhelmed by their academic and personal responsibilities.

1.8 Managing Technostress: Potential Solutions

1) Institutional Support and Training

Universities and academic institutions can play a critical role in alleviating technostress by offering training and support for students. This could include workshops on effective use of digital tools, stress management techniques, and time management strategies. Providing students with technical support and resources to troubleshoot common issues can reduce frustration and increase productivity.

2) Digital Detox and Mindfulness Practices

Graduate students can benefit from digital detox practices, such as setting aside time each day to disconnect from technology. Mindfulness techniques, such as meditation, yoga, and breathing exercises, can help students manage stress and improve focus. Encouraging breaks, physical activity, and hobbies can counteract the negative effects of extended screen time.

3) Encouraging Peer Support and Collaboration

Fostering a sense of community among graduate students is crucial. Virtual study groups, online forums, and peer mentorship programs can help alleviate feelings of isolation. Encouraging collaboration and creating spaces for students to share their challenges and solutions can promote emotional support and reduce technostress.

4) Promoting Healthy Technology Use

Graduate students should be encouraged to set boundaries with technology. This might include limiting screen time, setting "tech-free" hours, and creating designated spaces for studying and relaxation. Additionally, utilizing technology in a way that enhances productivity, rather than causing distractions, can help reduce stress.

5) Improving Time Management Strategies

Providing students with tools and resources for better time management can reduce the pressure to juggle multiple tasks. Techniques such as the Pomodoro Technique, time-blocking, and task prioritization can help students manage their time effectively, minimizing the stress associated with deadlines and academic demands.

1.9 More Strategies for Graduate Students to cope with technostress

1) Time Management and Digital Organization

One of the most effective ways to manage technostress is through better time management and digital organization. Graduate students can implement strategies like:

- **Time-blocking**: Setting aside specific times of the day for specific tasks or platforms (e. g., checking emails, attending virtual classes) can help prevent feeling overwhelmed.
- **Task prioritization**: Prioritizing tasks based on urgency and importance can prevent the feeling of being buried under a pile of digital obligations.
- **Limiting multitasking**: Focusing on one task at a time rather than jumping between platforms can reduce mental strain and improve productivity.

2) Creating Boundaries for Technology Use

Setting clear boundaries for technology use is crucial in managing technostress. Students can:

- **Designate "tech-free" times or spaces**: Establishing periods during which technology is not allowed (e. g., during meals, before bed) can help disconnect from digital overwhelm.
- **Use “do not disturb” features**: Setting up digital devices to limit notifications during focused study periods can help mitigate distractions and stress.
- **Unsubscribe from unnecessary notifications**: Unsubscribing from non-essential emails or app notifications can reduce the cognitive load of constant alerts.

3) Taking Breaks and Practicing Self – Care

Graduate students should schedule regular breaks throughout the day, especially after long periods of screen time. This helps reduce mental fatigue and improve focus. Additionally, practicing self-care routines such as physical exercise, meditation, or engaging in hobbies can provide relief from the stresses associated with technology use.

4) Seeking Peer and Institutional Support

Graduate students should not hesitate to reach out for help if they are feeling overwhelmed. Peer support networks, mentorship programs, and institutional resources like counseling services or workshops on time management can provide essential guidance and relief. Many institutions have resources that can help students manage technostress by offering training on specific technologies or mental health counseling.

5) Adopting Mindfulness Practices

Mindfulness techniques such as deep breathing, progressive muscle relaxation, or yoga can help graduate students remain present and reduce stress caused by technological demands. Mindfulness has been shown to improve concentration and decrease anxiety, making it a valuable tool for managing technostress.

6) Building Digital Literacy

Improving digital literacy is essential in reducing the stress caused by unfamiliar technologies. By familiarizing themselves with commonly used digital tools, platforms, and troubleshooting techniques, students can reduce anxiety related to the use of technology. Universities can support students by offering training programs or guides to help them develop these skills.

2. Conclusion

The post-COVID era has introduced a unique set of challenges for graduate students, with technostress emerging as one of the most significant. As technology becomes more integrated into the academic experience, it is crucial to address the psychological, physical, and academic consequences of technostress. By offering support, training, and resources, both institutions and individuals can mitigate the negative effects of technostress and help students navigate the complexities of digital learning and work environments.

As digital tools continue to shape the academic landscape, technostress is becoming an unavoidable reality for graduate students. Understanding the causes, consequences, and coping mechanisms related to technostress is crucial for mitigating its impact. By implementing strategies like effective time management, digital detox, seeking support, and enhancing digital literacy, graduate students can reduce the psychological, physical, and emotional toll that technology demands.

The post-COVID era has highlighted the need for institutions and individuals to be proactive in managing the pressures associated with technological advancement. By fostering a balanced relationship with technology, graduate students can thrive academically and personally in an increasingly digital world.

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