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Analysis of Technostress and Its Impact on Lecturer Performance in Technology-Based Learning

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Abstract

This study investigates technostress among lecturers in private universities under LLDIKTI Region III Jakarta and examines its impact on lecturer performance in technology-based learning environments. Employing a qualitative case study approach, data were collected through semi-structured in-depth interviews with 15 lecturers from various academic ranks, supported by observation and document analysis. Data were analyzed using the interactive model of Miles, Huberman, and Saldaña, involving data condensation, data display, and conclusion drawing. The findings reveal that lecturers experience multiple dimensions of technostress, including techno-overload, techno-invasion, techno-complexity, and psychological strain. Techno-overload emerges as the most dominant form, characterized by increased workload and continuous digital demands. Techno-invasion reflects the erosion of work–life boundaries due to constant digital connectivity, while techno-complexity highlights adaptation challenges to rapidly evolving technologies. These conditions collectively contribute to psychological outcomes such as stress, fatigue, and emotional exhaustion. Although technology enhances instructional flexibility and learning innovation, it simultaneously generates a paradox of increased cognitive and emotional burden. The study further finds that technostress influences lecturer performance in both enabling and constraining ways, depending on individual digital competence and institutional support. Lecturers adopt various adaptive strategies, including peer collaboration, self-directed learning, and participation in training programs, to mitigate technostress. The study concludes that technostress is not merely an individual issue but an organizational phenomenon embedded within digital transformation in higher education. The findings provide implications for developing sustainable digital policies and strengthening institutional support systems to enhance lecturer well-being and performance.

Keywords:
Technostress; Lecturer performance; Digital learning; Higher education; Qualitative study; LMS.

1. INTRODUCTION

The development of information and communication technology has brought significant changes to the implementation of higher education. Universities today do not only utilize technology as a learning support tool, but also as an integral part of academic processes, ranging from learning planning, lecture delivery, learning assessment, academic administration management, to research and community service activities. The increasingly massive digital transformation, particularly following the COVID-19 pandemic, has pushed lecturers to adapt to various digital learning platforms such as Learning Management Systems (LMS), video conferencing tools, online collaboration applications, and even the use of Artificial Intelligence (AI) in learning processes.

On the one hand, the use of technology provides various conveniences for lecturers in improving the effectiveness and flexibility of learning. However, on the other hand, the demand to continuously keep up with the rapidly evolving technology also creates considerable psychological pressure. This condition is known as technostress, namely stress experienced by individuals due to the inability or difficulty in adapting to the continuous development of information technology. Technostress can appear in various forms such as increased workload due to technology (techno-overload), disruption of personal life due to constant connectivity (techno-invasion), complexity in using technology (techno-complexity), fear of losing competence due to rapid technological development (techno-insecurity), and uncertainty caused by continuous system changes (techno-uncertainty).

The phenomenon of technostress is becoming increasingly relevant in the context of higher education because lecturers are among the professional groups required to adapt quickly to various digital innovations. Research by Wang and Yao (2025) shows that intensive use of technology in academic environments can affect lecturers' psychological well-being through various dimensions of technostress. The study emphasizes that although technology provides benefits in terms of efficiency and work flexibility, excessive use of technology also has the potential to cause work–family conflict, mental exhaustion, and a decline in academics' psychological well-being.

In the Indonesian context, the issue of technostress is also becoming increasingly important. A study by Amalia, Rimayanti, and Syahdan (2023) on university lecturers in Indonesia shows that several dimensions of technostress, particularly techno-overload, techno-insecurity, and techno-uncertainty, influence lecturer performance. The findings indicate that technology use can have both positive and negative impacts on performance, depending on lecturers' ability to manage technological demands.

Furthermore, research by Rafsanjani et al. (2023) reveals that the implementation of online learning in Indonesia still faces various challenges such as limited digital infrastructure, gaps in technological competence, and the demand to use multiple learning platforms simultaneously. These conditions have the potential to increase the level of technostress experienced by lecturers in carrying out their academic duties.

Recent developments also show that technostress challenges are no longer limited to the use of online learning platforms, but also include the emergence of new technologies such as artificial intelligence-based systems, learning analytics, and academic administrative automation. The increasing complexity of technology requires lecturers to continuously update their competencies in order to deliver effective learning. A systematic review conducted by Efnita et al. (2025) shows that techno-complexity is one of the factors that can reduce lecturer productivity if it is not balanced with organizational support and improvements in digital competence.

Although various quantitative studies have examined the relationship between technostress and lecturer performance, most of them still focus on statistical testing between variables. These studies have not been able to deeply capture lecturers' subjective experiences in dealing with technological pressure, the adaptation strategies they use, and the meanings they attach to the use of technology in learning processes. In fact, lecturers' experiences in facing digital transformation may vary depending on age, teaching experience, digital competence, institutional support, and workplace characteristics.

Therefore, a qualitative approach is essential in this study. Through a qualitative approach, researchers can deeply explore lecturers' experiences, perceptions, and interpretations of the technostress they experience in technology-based learning. This approach also allows researchers to understand how technostress affects lecturers' performance in designing, implementing, and evaluating learning, as well as to identify various strategies used by lecturers to adapt to the demands of higher education digitalization.

Based on this description, the study entitled "Analysis of Technostress and Its Impact on Lecturer Performance in Technology-Based Learning" is important to conduct in order to obtain a more comprehensive understanding of lecturers' experiences in facing digital transformation in higher education. The results of this study are expected to contribute theoretically to the development of technostress studies in academic settings and serve as a basis for universities in formulating digital competency development policies and organizational support systems that can minimize the negative impact of technostress on lecturer performance.

2. RESEARCH METHOD

This study employs a qualitative approach using a case study method. The qualitative approach was selected because the study aims to gain an in-depth understanding of lecturers' experiences, perceptions, and the meanings they attribute to the phenomenon of technostress emerging in technology-based learning implementation. According to Creswell and Poth (2023), qualitative research is used to explore and understand a social phenomenon from the perspective of individuals who directly experience it. In this study, the phenomenon under investigation is psychological stress caused by technology use (technostress) and its impact on lecturers' performance in the teaching and learning process.

The study was conducted among lecturers at private universities under the coordination of LLDIKTI Region III. The selection of this location was based on the consideration that universities under LLDIKTI Region III represent one of the regions with the largest number of private higher education institutions in Indonesia and have a relatively high level of adoption of learning technologies, including Learning Management Systems (LMS), video conferencing applications, academic information systems, and various other digital platforms supporting the implementation of the Tridharma of Higher Education.

Research informants were selected using purposive sampling, namely selecting participants based on specific criteria relevant to the research objectives. The inclusion criteria for participant selection were as follows: (1) lecturers who were actively teaching at private higher education institutions under LLDIKTI Region III Jakarta; (2) lecturers who had experience using digital learning technologies, including Learning Management Systems (LMS), video conferencing platforms, and other educational technologies; (3) lecturers who had at least two years of teaching experience in technology-based learning environments to ensure sufficient exposure to digital transformation; and (4) lecturers who voluntarily agreed to participate and were willing to share their experiences related to technostress in depth. These criteria were established to ensure that all participants possessed relevant knowledge and practical experience regarding the phenomenon under investigation. The study involved 15 lecturers from various academic ranks, including Assistant Professor, Lecturer, Senior Lecturer, and Professor. The inclusion of informants from different academic ranks was intended to obtain diverse perspectives regarding the use of technology and the challenges encountered in digital learning processes.

The research data consisted of primary and secondary data. Primary data were collected directly through in-depth interviews with the selected lecturers. The interviews were conducted using a semi-structured format, allowing the researcher flexibility to explore information more deeply based on each participant's experiences and context. The interview focused on lecturers' experiences in using learning technologies, the forms of technostress they experienced, its impact on their academic duties, and the strategies they employed to cope with technological pressure. Meanwhile, secondary data were obtained from supporting documents such as institutional policies on digital learning, guidelines for the use of online learning systems, academic activity reports, and relevant scientific literature related to the research topic.

Data collection techniques were carried out using three methods: in-depth interviews, observation, and documentation. In-depth interviews served as the primary technique for obtaining information on lecturers' subjective experiences of technostress. Observation was conducted to examine the use of technology in teaching processes, lecturers' interactions with digital platforms, and workplace conditions related to technology use. Documentation was used as supporting data to strengthen the findings obtained from interviews and observations during the research process.

Data analysis was conducted interactively using the model developed by Miles, Huberman, and Saldaña (2020), which consists of three main stages: data condensation, data display, and conclusion drawing and verification. In the data condensation stage, the researcher selected, simplified, and grouped data based on themes related to technostress and lecturer performance. The organized data were then presented in the form of narratives, matrices, and thematic categories to facilitate interpretation. The final stage involved drawing conclusions based on patterns, relationships, and meanings emerging from the data, followed by continuous verification throughout the research process.

To ensure data validity, the study employed source triangulation and technique triangulation. Source triangulation was conducted by comparing information obtained from lecturers of different academic ranks, while technique triangulation involved comparing findings from interviews, observations, and documentation. In addition, member checking was carried out by requesting participants to confirm the researcher's interpretation of the data. This process aimed to enhance the credibility and validity of the research findings.

Through this approach, the study is expected to provide a comprehensive understanding of how technostress is experienced by lecturers at private universities under LLDIKTI Region III Jakarta, how it affects their performance in technology-based learning, and the various adaptive strategies they employ in response to the demands of digital transformation in higher education.

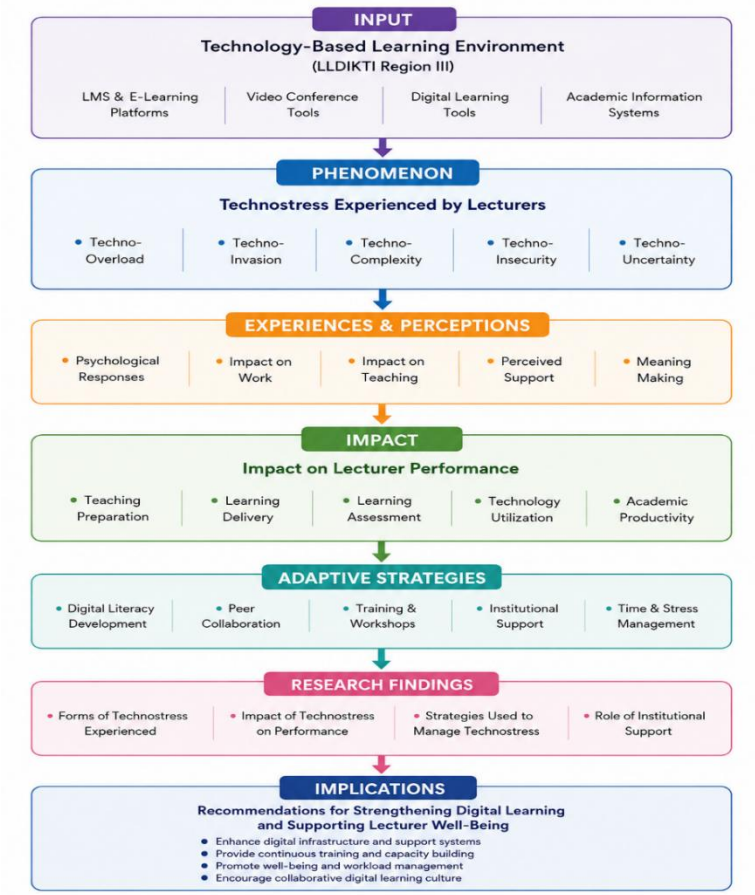

Figure 1. Research Framework

Figure 1 presents the conceptual framework of this study, which explores the phenomenon of technostress and its impact on lecturer performance in technology-based learning among lecturers at Private Higher Education Institutions (PHEIs) under LLDIKTI Region III. The framework begins with the increasing implementation of technology-based learning environments, including Learning Management Systems (LMS), video conferencing platforms, artificial intelligence (AI) tools, and academic information systems, which have become integral components of teaching and learning activities in higher education. The intensive use of these technologies may generate various forms of technostress, including techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. These dimensions shape lecturers' experiences and perceptions, reflected in their psychological responses, work-related challenges, teaching-related difficulties, perceived institutional support, and the meanings they assign to technology use in their professional activities. Such experiences may subsequently influence lecturer performance in several areas, including teaching preparation, learning delivery, learning assessment, technology utilization, and academic productivity. At the same time, lecturers may employ adaptive strategies such as enhancing digital literacy, engaging in self-directed learning, collaborating with peers, participating in professional development programs, and utilizing institutional support to cope with technostress. Through a qualitative approach, this framework serves as a guide for understanding how lecturers experience technostress, how it affects their professional performance, and what strategies they use to adapt to the demands of digital transformation in higher education.

3. RESULTS AND DISCUSSION

3.1. Participant Profiles

This study involved 15 lecturers from Private Higher Education Institutions (PHEIs) under LLDIKTI Region III Jakarta. To maintain confidentiality, each participant was assigned a code ranging from D1 to D15. The participants represented various academic ranks, including Assistant Professor (Asisten Ahli), Lecturer (Lektor), Associate Professor (Lektor Kepala), and Full Professor (Guru Besar). The diversity of academic ranks provided a comprehensive understanding of technostress experiences across different career stages and levels of academic responsibility.

3.2. Techno-Overload: Intensification of Academic Workload

The findings reveal that techno-overload is the most dominant dimension of technostress experienced by lecturers. Digital transformation in higher education has significantly increased both the volume and intensity of academic work. Rather than simplifying tasks, technology has expanded lecturers' responsibilities across multiple digital platforms, including learning management systems, online assessment tools, administrative portals, and real-time communication channels. This condition creates a continuous cycle of academic engagement that extends beyond formal teaching hours.

As expressed by D3, *"Technology makes teaching more flexible, but it also creates an endless stream of tasks that require constant attention."* Similarly, D7 stated, *"We are not only teaching anymore; we are monitoring students, responding to messages, and updating systems all at the same time."*

These narratives indicate that digitalization has restructured academic labor into a more fragmented and always-active form. This aligns with Tarafdar et al. (2019), who conceptualize techno-overload as a condition where technology accelerates work pace while simultaneously increasing workload demands. Ayyagari et al. (2011) further emphasize that information systems intensify role expectations by enabling continuous connectivity and real-time responsiveness. Recent empirical evidence by Wang and Yao (2025) and Kline et al. (2022) also demonstrates that increased digital dependency in academia correlates with elevated work pressure and reduced psychological well-being. Consequently, techno-overload in this study reflects not merely increased workload, but a structural transformation of academic labor into a permanently connected system of expectations.

3.3. Techno-Invasion: Erosion of Work–Life Boundaries

The study also identifies techno-invasion as a pervasive experience among lecturers, characterized by the blurring of boundaries between professional and personal life. Digital communication technologies, while enhancing accessibility and responsiveness, simultaneously extend academic work into private time. Lecturers frequently receive student inquiries, administrative notifications, and institutional messages outside formal working hours, resulting in a state of constant availability.

D6 noted, *"There is no real off-time anymore; messages can arrive at any hour, and we feel obligated to respond."* D2 further emphasized, *"Even at home, I am still connected to work because everything goes through my phone."*

This condition reflects the emergence of a "boundaryless academic environment," where spatial and temporal separations between work and life become increasingly indistinct. Zhao et al. (2024) argue that techno-invasion significantly contributes to emotional exhaustion and diminished recovery time among educators. Similarly, Ragu-Nathan et al. (2008) highlight that persistent connectivity reduces job satisfaction and increases role conflict. From a broader socio-technical perspective, this phenomenon aligns with the concept of "always-on culture" in digital labor environments, where responsiveness becomes an implicit performance expectation. Therefore, techno-invasion represents not only technological penetration but also institutional normalization of constant accessibility.

3.4. Techno-Complexity: Cognitive Burden of Continuous Technological Change

Another significant finding is techno-complexity, which arises from the increasing sophistication and rapid evolution of digital systems used in academic environments. Lecturers are required to continuously learn new platforms, adapt to updated systems, and integrate multiple technologies into their teaching practices, often without sufficient transition time or technical support.

D10 explained, *"Every semester there is a new system, and we have to start learning again from the beginning."* Likewise, D4 stated, *"Before we fully understand one platform, it is already replaced or updated."*

These experiences suggest that technological advancement in higher education is characterized by rapid obsolescence and continuous adaptation demands. Califf et al. (2020) argue that techno-complexity increases cognitive load and reduces perceived technological competence, particularly among users who lack systematic training. Tarafdar et al. (2019) further note that complexity becomes more stressful when organizational support systems are weak or inconsistent. From a cognitive theory perspective, continuous adaptation requirements increase extraneous cognitive load, thereby reducing efficiency in task execution. This study therefore highlights that the issue is not resistance to technology, but rather the accelerated pace of technological change that exceeds users' adaptive capacity.

3.5. Psychological Consequences of Technostress

The findings demonstrate that technostress has significant psychological consequences, including anxiety, frustration, mental fatigue, and emotional strain. These effects are particularly pronounced when technical failures occur during teaching or assessment activities, creating situational stress and performance pressure.

D2 stated, *"When the system suddenly crashes during class, I feel immediate panic because students are waiting."* D11 added, *"Sometimes I feel mentally exhausted because I always have to be ready for unexpected technical problems."*

These accounts illustrate that technostress extends beyond operational inconvenience and directly affects emotional stability. Upadhyaya and Vrinda (2021) found that prolonged exposure to digital demands significantly reduces academic well-being and increases burnout risk. Similarly, Salanova et al. (2013) describe how continuous technological pressure contributes to emotional exhaustion in knowledge-intensive professions. From the perspective of stress theory, these conditions reflect a mismatch between environmental demands and individual coping resources. Therefore, psychological resilience and digital self-efficacy emerge as critical mediating factors in mitigating technostress effects.

3.6. Impact of Technostress on Lecturer Performance

The study reveals a paradoxical relationship between technology and lecturer performance. On one hand, digital tools enhance instructional flexibility, resource accessibility, and pedagogical innovation. On the other hand, technostress increases cognitive workload and reduces efficiency in academic preparation and delivery.

D5 stated, *"Teaching becomes more interactive, but the preparation takes significantly more time than before."* D8 further noted, *"My performance is still good, but it requires much more effort and longer working hours."*

This paradox reflects what literature refers to as the "productivity–stress trade-off" in digital environments. Ayyagari et al. (2011) explain that while information systems improve task performance, they simultaneously introduce stressors that reduce overall efficiency. Similarly, La Torre et al. (2020) argue that technostress negatively affects productivity when organizational support is insufficient. The findings suggest that lecturer performance is not solely determined by technological availability but is strongly influenced by digital competence, workload management, and institutional readiness. Thus, technology acts as both an enabler and a constraint within academic performance systems.

3.7. Adaptive Strategies for Managing Technostress

Despite the challenges, lecturers demonstrate adaptive capacity through various coping strategies. These include self-directed learning, peer collaboration, informal knowledge sharing, participation in training programs, and reliance on institutional technical support.

D12 explained, *"When I face technical difficulties, I usually ask colleagues first because it is faster and more practical."* D1 added, *"Training helps, but most of the real learning happens through daily experience and discussion with peers."*

These findings indicate that coping with technostress is not purely an individual effort but a socially constructed process. Andika (2025) emphasizes that digital literacy and self-efficacy significantly enhance individuals' ability to manage technostress. La Torre et al. (2020) further argue that organizational-level interventions are more effective than individual coping alone in reducing technostress impacts. From a socio-technical systems perspective, resilience emerges from the interaction between individuals, peers, and institutional structures. Therefore, sustainable technostress mitigation requires integrated strategies that combine training, technical support, and collaborative learning ecosystems.

4. CONCLUSION

This study aimed to explore technostress among lecturers in private universities under LLDIKTI Region III Jakarta and examine its impact on lecturer performance in technology-based learning. Using a qualitative case study approach, the findings reveal that digital transformation in higher education has significantly reshaped academic work, producing both enabling and challenging consequences for lecturers.

The study identifies five main dimensions of technostress experienced by lecturers, namely techno-overload, techno-invasion, techno-complexity, psychological strain, and its impact on performance. Techno-overload emerges as the most dominant issue, characterized by increased workload and continuous digital demands that extend beyond formal working hours. Techno-invasion further intensifies this condition by blurring the boundaries between professional and personal life, creating a culture of constant connectivity. Meanwhile, techno-complexity reflects the ongoing challenges lecturers face in adapting to rapidly changing digital systems and platforms, often without adequate institutional support or structured training.

In addition, technostress is found to generate significant psychological consequences, including stress, fatigue, anxiety, and emotional exhaustion, particularly when technical disruptions occur during teaching activities. Although digital technology enhances flexibility and innovation in learning, its excessive and unmanaged use creates a paradox in which improved instructional quality is accompanied by increased cognitive and emotional burden.

The study also reveals that technostress has a mixed impact on lecturer performance. While technology supports more interactive and flexible learning processes, it simultaneously increases workload intensity and preparation demands, leading to reduced efficiency and greater effort requirements. However, lecturers demonstrate adaptive capacity through various coping strategies, including peer collaboration, self-directed

learning, participation in training programs, and reliance on institutional support systems. These strategies play a crucial role in mitigating the negative effects of technostress and enhancing digital resilience.

Overall, this study concludes that technostress is not merely an individual psychological issue but a structural and organizational phenomenon embedded within the digital transformation of higher education. Therefore, addressing technostress requires a comprehensive institutional approach that includes improving digital literacy, strengthening technical support systems, regulating digital communication practices, and providing continuous professional development for lecturers. The findings of this study are expected to contribute to the development of technostress literature in higher education and provide practical implications for university policymakers in designing more sustainable digital transformation strategies that support lecturer well-being and performance.

From a practical perspective, the findings suggest that higher education institutions should develop comprehensive digital transformation policies that not only emphasize technology adoption but also prioritize lecturers' well-being. Universities are encouraged to provide continuous digital competency development programs, accessible technical support, balanced digital workload management, and clear institutional guidelines regarding digital communication beyond working hours. Such organizational initiatives are expected to reduce technostress while improving lecturer performance and sustaining the quality of technology-based learning.

This study has several limitations. First, the findings are based on qualitative data collected from lecturers at private higher education institutions under LLDIKTI Region III Jakarta, which may limit the transferability of the findings to other institutional contexts. Second, the study focuses solely on lecturers' perspectives and does not include the views of institutional leaders, educational technology administrators, or students. Future studies are encouraged to employ mixed-methods or quantitative approaches involving broader samples from different regions and institutional settings. Further research may also examine the effectiveness of institutional policies, digital leadership, and organizational support programs in mitigating technostress and enhancing lecturer performance.

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