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TECHNOSTRESS MITIGATION IN EDUCATION: A PERSON–ENVIRONMENT FIT APPROACH TO ICT DEMANDS AND TEACHER CAPABILITIES

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Abstract
Digitalization of education has become an accelerated process worldwide, and information and communication technologies (ICTs) have become the focus of teaching, assessment, and administration. Though ICT adoption leads to flexibility, accessibility and innovation, it also causes technostress whereby digital demands are more than teachers can handle or where institutions do not offer sufficient support. To reinvent the concept of technostress as a fit between technological demands and teacher skills or between teacher demands and institutional resources, the Person-Environment (P-E) Fit theory is used in this paper. It looks at the mediating effect of perceived ICT usefulness in mediating these relations, the effects of misfit on job satisfaction and job performance, and how institutional inhibitors such as literacy facilitation, technical support, and involvement facilitation could be used to reestablish the fit. Restructuring technostress as an organizational issue and not as an individual failure, the paper indicates the role of institutional strategies that can guarantee ICT adoption to enhance teacher well-being and effective digital transformation in education.

Keywords: Technostress, Person–Environment Fit Theory, ICT in Education, Institutional Support, Teacher Well-Being

1. Introduction

The digitalization of education has significantly transformed educational practices globally. Information and Communication Technologies (ICTs) are integral to lesson planning, student interaction, assessment, and administration, thus playing a crucial role in contemporary education. The implementation of ICT has enhanced flexibility, access, and collaboration; however, it has also introduced new sources of occupational stress for teachers. Technostress occurs when the demands of technology exceed the capabilities of the teacher or when the institution fails to provide adequate resources and support (Jena, 2015a; Tarafdar et al., 2010). Technostress encompasses several dimensions: techno-overload refers to excessive digital demands; techno-complexity pertains to the challenges of learning new platforms; techno-uncertainty involves frequent changes; techno-invasion signifies the blurring of professional and personal boundaries; and techno-insecurity relates to the fear of obsolescence. These stressors adversely affect the well-being, job satisfaction, and performance of teachers, especially when educational institutions prioritize rapid digital implementation without aligning efforts with the actual capabilities of teachers (Estrada-Muñoz et al., 2021; Penado Abilleira et al., 2021).

This paper employs the Person-Environment (P-E) Fit theory to elucidate technostress, conceptualized as a misalignment between individual capabilities and environmental demands (demands-abilities misfit) or between personal needs and institutional provisions (needs-supplies misfit) (Caplan, 1987; Edwards, 1996). Technostress is re-conceptualized as an organizational issue rather than a personal inefficiency. The framework emphasizes the significance of institutions in ensuring that digital infrastructure, educational and training opportunities, and support systems are aligned with the needs of teachers.

This paper examines technostress through the P-E Fit framework, its impact on teacher satisfaction and performance, and the mediating role of ICT usefulness, along with institutional factors such as literacy facilitation, technical support, and involvement facilitation in reestablishing alignment. This study contributes to technostress research and the discourse on digital education by identifying supportive institutional processes as essential for sustainable and effective ICT integration.

2. Theoretical Framework: Person–Environment Fit Theory

The Person-Environment (P-E) Fit theory is a sound conceptual framework that can be used to study technostress in education. The theory is an offshoot of organizational psychology, and it is based on the fact that the individual outcomes, including satisfaction, motivation and strain, are not only influenced by the personal attributes or environmental conditions, but also by the level of congruence between the two (Caplan, 1987; Edwards, 1996). Stress occurs when the demands and the supply of the environment and that of individuals are not matched, or when what is needed by individuals is not supplied by the environment.

P-E Fit theory is especially applicable in education to examine ICT pressures. Demands-abilities misfit takes place when teachers are asked to incorporate digital tools and platforms that are beyond their technical, time, or cognitive capacity. This is directly connected to such dimensions of technostress as techno-overload, techno-complexity, and techno-uncertainty, which occur when systems are challenging, complicated, and dynamic (Jena, 2015b; Tarafdar et al., 2010). In comparison, needs-supplies misfit occurs when the teachers need institutional resources (training, infrastructure, recognition, or work-life balance) and they are not received properly. This type of outcast is demonstrated through techno-invasion and techno-insecurity, when the institutional provisions are not able to protect boundaries or assist professional confidence (Penado Abilleira et al., 2021).

The P-E Fit approach to technostress shows that technostress is not the outcome of personal failures, but a systemic problem, which is associated with institutional and governance structures. Notably, the negative and positive interpretations of ICT-related stress are possible under this perspective. Whereas unresolved misfits introduce strain, aligned conditions may bring about techno-eustress, which is a type of positive stress that leads to learning of skills, innovation, and resilience (Tarafdar et al., 2019). Therefore, it is possible to say that technostress can harm or improve teacher well-being, and much depends on the design of environments that can meet teacher requirements and capabilities.

3. Technostress in Education: A Global Challenge

The issue of technostress has turned into an international issue in every system of education, and both developed and developing settings have shown signs of it. Teachers in Spain also responded to online platforms with increased techno-complexity and techno-uncertainty, and the report about the rapid changes showed that misfits between ICT requirements and teacher competences are exacerbated by rapid changes (Penado Abilleira et al., 2021). On the same note, in Chile, educators were exposed to techno-overload and techno-invasion, with online platforms overloading teachers and disrupting professional boundaries (Estrada-Muñoz et al., 2021). These results prove that technostress is not a peripheral phenomenon but an institutional problem inherent in educational systems across the globe.

There are also observed patterns of stress in the Asian contexts. Techno-insecurity and techno-complexity were found to be major contributors to strain in India, and a number of teachers said they lacked training and were experiencing unstable digital systems (Jena, 2015a; Upadhyaya & Vrinda, 2021). A study was conducted in China that showed that technostress had a negative impact on job satisfaction and self-confidence, but they were mediated by digital competence of the teachers (Zhao et al., 2022). In Indonesia, techno-overload and emotional exhaustion were revealed to lower the morale of teachers, which reduced their capability to maintain innovative classroom practices (Bernarto et al., 2020). These results demonstrate the universality of technostress, as well as how the manifestations of the stress can vary according to the conditions of the institutions, infrastructures, and cultures.

Technostress is still present even in the technologically advanced education systems. The study by La Torre et al. (2020) indicated an increase in anxiety during the pandemic associated with constant changes in ICT, and it was important to note that high-resource settings do not remove misfits in situations where institutional supports are weak or inconsistent.

All these findings combined show that technostress is not the natural outcome of personal inability but a system problem that is created when the educational institutions fail to synchronize ICT requirements with the capacities of their teachers. The world must support the digitalization process by providing effective training, stable infrastructure, and participatory support structures in institutions to make sure that the global trend of digitalization does not harm teacher well-being but empowers it.

4. ICT Usefulness as a Mediator

The degree to which teachers find ICT useful is the backbone of the experience of the technological demands. Based on the Technology Acceptance Model, perceived usefulness is associated with the assumption that ICT can be used to improve teaching performance, decreased effort, or improved learning. This perception in the framework of technostress is a strong mediator between environmental requirements and personal outcomes. Teachers who view ICT as being of value are more ready to put in the time and cognitive resources needed to bridge the gaps in skills which will re-frame demands as challenges to be learnt, not as threats that create strain. On the other hand, the perceived low usefulness can even increase misfits demanded by moderate ICT requirements and worsen feelings of overload, complexity, and insecurity (Ayyagari et al., 2011; Tarafdar et al., 2019). Perceived usefulness is a factor that helps to restore alignment in two folds considering the P-E Fit. On the demands-abilities dimension, high usefulness is the reason why teachers are encouraged to acquire digital competencies, and the lack of misfit improves with time. On the needs-supplies side, usefulness can be used to make technologies answer real pedagogical/professional needs, reducing perceptions of redundancy or intrusion. Perceived usefulness therefore does not just act as an attitudinal factor but as an activity that would either lead to the occurrence of techno-distress or techno-eustress depending on whether the ICT demands are fulfilled or not.

Notably, the institutional practices influence the formation of the perceptions of usefulness as well as individual attitudes. Institutions affect usefulness through the meaningful training programs that are offered, the assurance of reliable technical support, and the choice of technologies that works to support the teaching objectives. Literacy facilitation programs can assist teachers to appreciate ICT as an asset and not a liability through linking digital tools to the classroom activities. Equally, a properly managed infrastructure and easy access to support personnel enhances the practical value of the use of technology and participation in decision making in schools makes the teachers perceive the use of ICT as pertinent to their real needs.

In this regard, the ICT usefulness does not exist as some sort of individual and fixed perception but rather it is something constructed in organizational policies and practices. Organizations that give importance to training, reliability, and teacher engagement create conditions, in which digital tools can be viewed as facilitators, but not as sources of strain. In the P-E Fit model, perceived usefulness is therefore a mediating factor between institutional performance and personal teacher experiences, as it determines whether digital change will contribute to teacher well-being or not.

5. Outcomes of Technostress: Job Satisfaction and Performance

The implications of technostress on teacher outcomes are far reaching especially as far as job satisfaction and performance are concerned. Job satisfaction is strongly connected with the level of person environment fit. In cases where teachers are subjected to demands-abilities misfit either because of too much complexities in ICT or needs-supplies misfit due to lack of proper institutional support, satisfaction will be low. Empirical research indicates that unaddressed technostress is one of the causes of emotional exhaustion, role conflict, and diminished professional fulfillment (Estrada-Muñoz et al., 2021; Salanova et al., 2013). In the situations, where the work-life balance is undermined by techno-invasion, the dissatisfaction is further enhanced when teachers cannot find a

way to preserve their personal boundaries in the presence of continuous digital pressure (Penado Abilleira et al., 2021).

The performance effect is also dramatic. On the task level, technostress negatively affects planning, delivering, and assessing of the teacher as a large part of cognitive resources is redirected to technology issues (Ayyagari et al., 2011). Teachers who feel insecure or overloaded at the contextual level, where collaboration, collegiality, and institutional citizenship behaviours are enacted, are less likely to participate in teamwork, mentoring and sharing digital practices. Paradoxical results may be generated at the adaptive level, however, by technostress. The perception of ICT as helpful and institutionally supported can make teachers direct stress at the development of new competencies, pedagogy experimentation, and innovation of classroom strategies, thus, increasing adaptability (Tarafdar et al., 2019). This duality highlights the distinction between the techno-distress (that weakens results) and techno-eustress (that leads to resilience, learning and growth).

The institutions are at the center of dictating the dominant of these outcomes. By offering ongoing professional education, strong technical assistance and substantive opportunities to engage in, schools and universities decrease misfits and enhance teacher satisfaction. Similarly, through a consistent infrastructure and mechanisms of participation in decision making, institutions can make sure that ICT integration is a mirror of the realities of teachers. By so doing, not only is well-being and performance of teachers not an individual responsibility but also a system consequence of organizational practices. The correspondence between ICT needs and teacher abilities will depend on whether institutions actively develop environments that allow to reduce the levels of distress and enhance adaptive development.

6. Technostress Inhibitors as Fit-Restoring Mechanisms

Technostress is not inherently negative; its effects can be mitigated through systemic interventions that restore equilibrium between ICT requirements and teacher capabilities. In the P-E Fit model, these interventions serve as fit-restoring mechanisms, addressing both the misalignments between needs and supplies as well as those between demands and abilities. Literacy facilitation, technical support, and involvement facilitation have been emphasized in the literature (Jena, 2015a; Tarafdar, 2011).

Literacy facilitation addresses the mismatch between demands and abilities by improving teachers' digital skills, enabling the integration of ICT into pedagogy. Ongoing, contextually relevant professional development enhances simplicity and boosts teachers' confidence and willingness to experiment with new tools. Institutional initiatives aimed at incorporating digital literacy into teacher education and professional learning communities are effective in mitigating stressors related to skill development and enhancing long-term ICT adoption.

Technical support mitigates uncertainty and overload by ensuring that ICT infrastructure operates effectively and is responsive to challenges. Teachers, regardless of their technological proficiency, may experience frustration and diminished performance when technical issues disrupt classroom activities or administrative processes. Institutions are significant due to their reliable infrastructure, presence of on-site IT support staff, and ability to respond swiftly to technical issues. These mechanisms conserve teachers' cognitive resources for instruction, thereby minimizing challenges and associated strain. The misalignment between needs and supplies, as elucidated by involvement facilitation, is addressed by granting teachers a substantial role in ICT-related decision-making. Involving teachers in platform selection, defining digital workflows, and establishing implementation strategies aligns institutional facilities more closely with classroom realities. This involvement fosters a sense of ownership, reduces the perception of externally imposed requirements, and facilitates the acceptance of technological reforms. This mechanism can be implemented in educational institutions through the establishment of participatory committees, collaborative planning, or teacher-led ICT innovation groups. The combination of these inhibitors demonstrates

that technostress extends beyond individual adaptation, reflecting institutional preferences. Organizations that integrate literacy facilitation, technical support, and involvement facilitation into their digital education strategies foster environments where ICT demands are perceived as enabling rather than disabling. These interventions not only mitigate stress but also transform potential techno-distress into techno-eustress, fostering resilience, innovation, and sustainable digital transformation in education.

7. Discussion

The paper seeks to re-conceptualize technostress in education through the lens of Person-Environment (P-E) Fit theory, emphasizing that the demands of ICT are viewed as either burdens or opportunities depending on institutional support for teachers. The findings indicate that technostress is not solely a result of individual inadequacy but rather a consequence of systemic misalignments between technological environments and teacher competencies. The analysis situates inhibitors within the broader framework of institutional practices, thereby broadening the academic discourse on technostress. It links stress reduction to organizational practices and highlights the role of institutions in shaping the outcomes of digital education.

Literacy facilitation serves as a foundational institutional mechanism. The situation results in unavoidable discrepancies between demands and abilities among teachers lacking digital competence, thereby heightening techno-complexity and insecurity. Evidence suggests that well-structured and continuous training programs enhance confidence, reduce anxiety, and increase the willingness to adopt new tools (Jena, 2015a; Li & Wang, 2021). Institutions that integrate digital literacy into professional development frameworks will be better equipped to mitigate technostress and promote equity among teachers with diverse levels of prior experience.

Additionally, technical support serves as a crucial mechanism for mitigating techno-overload and techno-uncertainty. Teachers lacking digital competence experience stress during system malfunctions or when timely assistance is unavailable. Research indicates that a well-developed technical support infrastructure reduces strain and enhances satisfaction by providing reliability and responsiveness (Suh & Lee, 2017; Tarafdar et al., 2010). Schools that employ full-time IT personnel and maintain robust infrastructure and troubleshooting services can alleviate the pedagogical workload for teachers, thereby reducing stress and improving performance.

The needs-supplies misfit is addressed by facilitating involvement, which enhances professional agency. Active involvement of teachers in the selection of platforms, piloting of tools, and formulation of integration strategies diminishes the likelihood of perceiving ICT reforms as intrusive. Empirical research demonstrates that user involvement enhances system acceptance and reduces resistance to change (Ragu-Nathan et al., 2008; Tarafdar et al., 2010). Institutions that implement participatory mechanisms, such as teacher committees, collaborative ICT planning groups, or innovation forums, foster a sense of ownership regarding digital initiatives and improve alignment with classroom realities.

The results underscore that mitigating technostress requires a comprehensive approach rather than a singular solution or isolated coping strategy. It entails systematic measures aimed at restoring person-environment fit to ensure alignment between ICT needs and teacher competencies and professional standards. Institutions can mitigate the adverse effects of techno-distress by incorporating literacy facilitation, technical assistance, and involvement facilitation into their policies and practices. This approach will enhance their resilience, innovation, and sustainable digital transformation in education.

This institution-focused perspective enhances the understanding of technostress scholarship by

demonstrating that solutions extend beyond psychological or individual factors to encompass organizational dimensions. Technostress serves as a measure of the effectiveness of institutions' digital transformation strategies, reflecting the actual experiences of educators. Subsequent research should concentrate on parallel instances of institutional ICT integration and examine how variations in support mechanisms influence teachers' experiences in diverse environments.

8. Implications for Future Research

Although this paper redefines the concept of technostress within the Person-Environment (P-E) Fit framework, which focuses on the mechanisms within the institution, there are a few areas that need to be investigated.

To begin with, comparative research across institutions and education systems is required to comprehend how the institutional resources and support structures contribute to the facilitation of literacy, technical support, and involvement facilitation. This may be due to the degree to which schools and universities are investing in ICT resources to justify cross-national differences in technostress, but empirical data is still not fully consolidated.

Second, the longitudinal study may help to understand how technostress will change with time as digital reforms get older. Though initial adoption phases can make misfits worse, institutional interventions in the long run, through incessant training, and institutionalized participation, might convert distress into eustress. Monitoring these dynamics would enhance the knowledge of ICT-related adaptation.

Third, there is a need to conduct multi-stakeholder analyses. Recent studies tend to give preference to the school teachers, however, the views of school administrators, IT coordinators, students, and parents might provide a picture of how the institutional decisions are in-synergy with or out of different educational needs.

Lastly, more holistic view of the technostress can be promoted by interdisciplinary methods, which may combine the approaches of education, psychology, information systems, and organizational studies. Positioning teacher experiences in a wider institutional and systemic contexts, the future research will help to understand how the digital transformation challenges and empowers the education systems.

9. Conclusion

Although the present study redefines technostress and changes the Person-Environment (P-E) Fit lens and concentrates more on the institutional mechanisms, there are a number of aspects which need to be examined.

This paper re-defined technostress in education using the Person-Environment (P-E) Fit paradigm by highlighting the fact that stress does not represent a mere issue of individual incompetence but rather a systemic result of misfits between ICT requirements and teacher competencies or between institutional needs and institutional offers. The study examined the facilitation of literacy, technical support, and involvement facilitation as some of the major inhibitors and thus showed that the governance interventions were necessary to mitigate technostress, through restoring the alignment and converting potential distress to eustress.

More importantly, the analysis put governments as central players in the governance of digital education. The closest units of government, municipalities and regional authorities, have the capabilities and the legitimacy of institutionalizing the training programs, offering consistent technical assistance, and engrave participatory decision-making into the processes of ICT adoption. There are effective experiences in the field of decentralized governance like the example of Kerala IT@School and KITE, which demonstrates institutionalization of digital literacy, alleviation of teacher stress, and the perpetuation of educational innovation.

The political implication is obvious: infrastructure investments are not enough to ensure sustainable digital transformation. It demands holistic governance systems, which enable teachers to be partners but not passive on ICT integration. The local governments are then supposed to develop policies that will ensure fair access to training, have viable technical infrastructure, and institutionalize teacher participation in decision making.

With the local governance strategies being modified to include technostress mitigation, education systems can shift their focus on reactive coping to the proactive capacity building. This way, they will make sure that ICT integration will make teachers healthier, and more professionally productive, and also guarantee the sustainability of the digital education reforms.

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