Navigating The Digital Classroom: Mitigating Technostress To Enhance Teacher Well-Being And Performance

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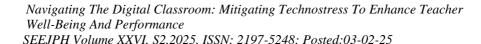| KEYWORDS	ABSTRACT
Technostress, educational technology, job performance, teacher well-being, institutional support, Conservation of Resources (COR) theory	The use of technology in learning institutions has impacted on the teaching and management systems to enhance the quality of education and organizational performance but brings about challenges such as technostress among teachers. This stress, including overload, invasion, complexity, uncertainty, and insecurity, was made worse by the COVID-19 transition to online teaching. Technostress at high levels affects the capacity to handle work-related demands, decreases attention and increases mistakes, thus, diminishes job performance. The pressure to learn new technologies leads to cognitive overload, frustration, and health issues, and all these affect well-being. Based on the Conservation of Resources (COR) theory, this paper suggests training, teacher involvement, and technical assistance to counter these effects, thus improving job satisfaction and productivity in schools.

Introduction

The integration of technology in learning institutions has been fast and has significantly altered how teachers engage with their learning environment. The development of this technology is meant to improve educational results and organizational effectiveness. However, the use of digital tools has also brought some problems, including technostress in teachers due to the use of information technology. Techno-stress can be defined as techno-overload, techno-invasion, techno-complexity, techno-uncertainty and techno-insecurity. Technostress is therefore described as the stress and strain that results from the perception of technology demands as being beyond the available resources.

Past studies have also described the negative impact of technostress on different careers. Research has indicated that teachers experience a lot of challenges because of the constant innovation and improvement of ICT devices and applications, which makes them spend more time and energy to learn and embrace new technologies (Dong et al., 2020; Panisoara et al., 2020). This stress can result in the teachers' reduced motivation to integrate technology in their practices, which affects their job performance and satisfaction (Estrada-Muñoz et al., 2021).

A study on technostress among primary school teachers found out that because of the COVID-19 pandemic, the use of technology was enhanced and this influenced the work-family conflict and health of the teachers. According to the Conservation of Resources (COR) theory, stress arises when there is a threat or loss of resources, which include time, energy, and psychological resources. This theory assists in explaining how the enhanced technological requirements have exhausted the teachers' reserves, thus raising technostress (Wang et al., 2008).

In addition, studies have revealed that there are various factors that determine the extent of technostress among teachers, which include; age and gender. Technostress is higher among older teachers and female teachers than young and male teachers. Also, the absence of institutional support

increases technostress since teachers are burdened with new technologies without proper training and support (Ong & Lai, 2006; Ragu-Nathan et al., 2008).

This paper focuses on the effects of technology use in learning institutions and explores ways of reducing the effects of technostress. The research aims to address the following questions: The research aims to address the following questions:

1. In what ways does technostress impact teachers' job performance, job satisfaction, and psychological health?

2. How can technostress be managed and teacher well-being and performance be improved?

In this way, we want to achieve a positive working climate for teachers and, thus, improve their job performance and satisfaction (Salanova et al., 2013).
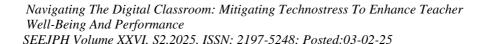
Review of Literature

Technology integration in school entails the purposeful and consistent incorporation of technology in the teaching-learning process and in the management of institutions. This involves the application of learning management systems, virtual classrooms, online grading tools, and other communication technologies. Although these tools are designed to enhance learning and organizational effectiveness, they present numerous problems, especially in terms of technostress for teachers (Ayyagari et al., 2011). Technostress can be defined as the stress and strain that people encounter when technology requirements surpass their capacity to meet them. It encompasses several dimensions: Techno overload, techno invasion, techno complexity, techno uncertainty, and techno insecurity are the five dimensions of techno stress that have been identified by Tarafdar et al., (2007) and Li and Wang (2021).

Several research works have revealed that the integration of technology in learning institutions especially during the emergence of COVID-19 pandemic has affected teachers. A significant number of teachers stated that the use of new technologies and online classes increased their stress levels because of the need to learn new tools and strategies. This rapid change has contributed to workload, work family conflict, and health problems, which reveal the negative impact of technostress on teachers' well-being (Joo et al., 2016). Holland et al. (2016) established that a large proportion of teachers suffer from technostress because of the constant requirement to update their knowledge regarding technology. Furthermore, Ayyagari et al. (2011) found that most teachers believe that technology has contributed to the increase of their working load, a factor that causes stress and burnout. Also, Tarafdar et al. (2007) pointed out that due to the frequent enhancements and modifications in the educational technology, the teacher feels more vulnerable.

Critics of the use of technology in teaching and learning have pointed out these challenges but proponents of the use of technology in teaching and learning have supported the use of technology in teaching and learning since it enhances students' participation, student centered learning and efficiency in management of institutions. However, it is important to counter the negative impacts of technostress so that teachers can fully benefit from the tools without negatively impacting their health and satisfaction (Salanova et al., 2013). This paper aims at discussing ways of minimizing the impact of technostress among teachers. Some of the solutions are: ICT literacy training for teachers, teachers' participation in the selection and integration of ICT and technical support for teachers. In this way, schools can ensure that the necessary conditions are created to promote both the use of technology in education and the support of teachers' work (Çoklar et al., 2017).

Theoretical Background

Conservation of Resources (COR) theory proposed by Stevan Hobfoll in 1989 was aimed to explain the processes of stress responses in different contexts, including educational environment with the focus on technology integration. Based on COR theory, stress is defined as perceived threat, actual loss, or perceived inability to replace resources after investing in them (Hobfoll, 1989). This framework is relevant in explaining technostress among teachers since it focuses on the loss of resources and perceived inadequacy as causes of stress. According to the COR theory, people have

the need to acquire, maintain, and protect their resources. These resources may be anything that is considered as valuable by the individual, including personal characteristics such as self-efficacy and resilience, support from colleagues and administration, organizational structures that support teaching related activities, and technology that supports education. In the context of education, where the integration of technology is ever-increasing, the availability and adequacy of these resources directly impact teachers' stress levels and their overall job performance and satisfaction.

When teachers feel that the technology they have is insufficient to address the requirements of the job—such as training in a new software or incorporating advanced technology tools into the classroom—the stress response that is elicited results in negative consequences. These are; reduced job satisfaction, reduced job performance, and even burnout (Halbesleben et al., 2014).

Application of COR Theory to Technostress

When applying the COR theory in the context of technostress among teachers, it is possible to understand that the lack of technological resources can cause a depletion of psychological resources. For instance, poor preparation on new technologies in education reduces teachers perceived self-efficacy. This erosion, in turn, impacts on their capacity to implement these technologies into their teaching practice (Salanova et al., 2013). Furthermore, when the teachers do not receive adequate organizational support or technologies that are easy to use, they may end up feeling strained and unable to meet the technological requirements of their jobs, which in turn causes more stress and job dissatisfaction (La Torre et al., 2020). The COR theory also describes the differences in the technostress experiences depending on the demographic characteristics and the institutional environment. For example, older teachers and female teachers who are likely to have fewer resources in terms of digital literacy and support are more vulnerable to technostress (Ong & Lai, 2006). Furthermore, the lack of institutional support such as inadequate training and technical support increases the resource depletion experienced by the teachers and thus increases technostress (Ragu-Nathan et al., 2008).

The COR theory therefore provides useful information on how stress associated with technology usage in learning institutions can be managed. Therefore, through providing teachers with the required resources including adequate training, strong support and effective technology, schools can avoid the exhaustion of teachers' resources. This support also aids in reducing technostress and improves job satisfaction and performance since the teachers are made to feel more capable and backed up in their positions.

The Impacts of Technostress Among Teachers

The use of technology in learning environment as a tool to support teaching effectiveness and to facilitate administrative work has brought about new challenges among teachers. Technostress, a concept that refers to the stress and strain that individuals go through when trying to cope with new technologies, has significant impact on teachers' job performance, job satisfaction and health. This section aims at presenting the various effects of technostress on teachers based on a review of literature.

Techno-stress can cause a drastic decline in teachers' job performance because of techno-overload, techno-invasion, techno-complexity, techno-uncertainty, and techno-insecurity. These stressors lead to cognitive overload, decreased attention, and increased mistakes, which in turn decreases overall job performance (Saleem et al., 2021). Teachers who experience high levels of technostress have cited that they have poor time management in handling their workload which in turn hampers their efficiency in disseminating knowledge (Ayyagari et al., 2011). The constant demand to conform to new technologies can also wear out teachers, reducing the time they have to spend with students and in lesson planning, which degrades their performance even more (Wang et al., 2008).

Furthermore, the constant need to learn new technological tools and platforms, which are often introduced to the classroom, can lead to frustration and helplessness among teachers, thus reducing their job satisfaction levels. Studies show that teachers with technostress have lower job satisfaction

because of the pressure exerted on their psychological well-being (Aktan & Toraman, 2022). The failure to manage the work and family conflict coupled with technostress results to overall job dissatisfaction and hence higher turnover intentions among teachers (Tarafdar et al., 2011). In addition, the pressure from technological expectations can result in critical physical and psychological disorders, which in turn influence job productivity and contentment in an indirect manner. Teachers who experience technostress may exhibit symptoms such as nervousness, depression, fatigue, and burnout, which negatively impact their job performance and decrease their job satisfaction (Joo et al., 2016). These health difficulties might have a reciprocal impact and worsen each other, creating a cycle where declining health makes it even harder to fulfil employment demands, resulting in stress and dissatisfaction with the job (Ayyagari et al., 2011). This cycle of stress is further compounded by work-family conflicts since teachers are unable to balance between work and family responsibilities. The integration of digital tools demands constant connection, which results in the overlapping of work and personal life, thus, increasing stress levels and reducing the level of life satisfaction (Saleem et al., 2021). As a result, this conflict decreases job satisfaction and increases stress, which hinders teachers from executing their responsibilities efficiently (Aktan & Toraman, 2022).
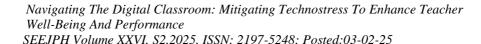
Another factor that was identified to have an impact on technostress is support from the organization which is a factor that helps in moderating the effects of technostress on job performance and satisfaction. Therefore, schools and educational institutions that provide adequate technical support, training, and psychological services can reduce the impact of technostress on teachers' job performance and satisfaction (Dong et al., 2020). On the other hand, where there is no such support, the impact of technostress on the employees is higher and this leads to low satisfaction and poor performance among the employees (Ioannou et al., 2024). Technostress is also found to have a negative effect on quality of work-life (QWL) and therefore the general job satisfaction and performance. According to the literature, techno-complexity and techno-overload are some of the antecedents that negatively affect QWL and hence decrease job satisfaction and increase turnover intentions (Saleem et al., 2021).

In addition, technostress can lead to a decrease in teachers' motivation to integrate new approaches to teaching and use of technologies. Lack of motivation may lead to reduced enthusiasm among teachers, which in turn affects the students and the quality of education provided to them (Estrada-Muñoz et al., 2021). This demotivation is usually accompanied by poor interpersonal relations among the employees. Stressed teachers may become less social and lonelier, which means that they will not be able to consult with other teachers and share knowledge. This isolation also reduces job satisfaction and performance even more because teachers are lonely in their working environment (Aktan & Toraman, 2022).

In conclusion, technostress presents a major concern to teachers because it hampers their performance, satisfaction, health, and interactions with other professionals. Solving these problems implies the effective institutional support, the continuous professional development, and the creation of a positive work climate to reduce the negative impact of technostress and improve the educational performance.

Strategies For Mitigating Technostress Among Teachers
Some of the specific measures that can be taken to reduce technostress among teachers are: ICT literacy facilitation; teachers' participation in ICT planning and implementation; and adequate technical support. Teachers' ICT literacy is therefore another important factor that should be addressed to help in the fight against technostress. It is crucial to develop extensive training courses aimed at preparing teachers to integrate ICT into their classrooms. The training can be conducted frequently and updated to help in the reduction of anxiety that is related to new technologies (Ioannou et al., 2024; Joo et al., 2016). Also, the teachers can participate in a multiple number of workshops, webinars, and online courses that make them aware of the updates in technology. Professional learning increases confidence and encouragement among teachers to use technology, and, in this regard, decrease technostress (Hatlevik & Hatlevik, 2018; Li & Wang, 2021. Engaging the students in group work and peer support also helps to reduce technostress. Teachers who disseminate their

information and ideas with other teachers are likely to feel more encouraged and less lonely in their technological activities. This can be done through communities of practice and through daily collaborative meetings where teachers can share their knowledge and work together to solve technological issues (Joo et al., 2016; Örneği et al., 2015).

Furthermore, by integrating the teachers into the processes of designing and integrating ICT systems, the tools will be made easier to use and consistent with their requirements. Participatory approach noted can decrease the level of resistance on use of new technologies and increases the feeling of ownership and control hence decreasing technostress (Salo et al., 2018). This enables regular feedback from the teachers concerning the ICT tools and systems in use to ensure modification and innovation. Such feedback can assist in solving usability problems and making sure that the technology enhances instead of complicating the teaching practices (Ioannou et al., 2024; Sellberg & Susi, 2014). Introducing teachers into such processes enables the establishments to develop better and efficient technologies that suits the tasks of the teaching fraternity.

Another way of reducing technostress includes making available specific technical support teams to assist the users. That is why the speed and efficiency of eliminating technical problems can have a decisive influence on the level of stress related to new technologies. Specific assistance can vary from resolving issues with some of the hardware and/ or software to explaining how to optimally employ a particular tool (Hung et al., 2015). Also, fostering People Supporting Peer Support Networks at schools may assist in the reduction of technostress among learners. Through this method, teachers can discuss what they learned, encountered and discovered as well as strategies to adopt for the efficient use of the technology in their practice, thus cutting down on their isolation stress (Efilti & Çoklar, 2019; Özgür, 2020). These peer networks offer solutions to a group of colleagues, support systems, and therefore improve the teaching and learning climate.
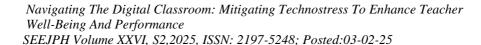
The teachers need to be trained on how to use the ICT in their teaching and this can be done through structured professional development programs that are practical based. These programs should be tailored to the requirements and difficulties of teachers in the given educational environment. In this way, the professional development programs can meet the above-mentioned specific needs and increase the teachers' competence and confidence in the use of technology, which in turn will decrease the level of technostress (Joo et al., 2016; Li & Wang, 2021). This approach helps to ensure that the teachers are not only technically prepared, but also know how to apply the technology in the classroom.

In conclusion, through the use of these strategies, educational institutions can foster an environment that minimizes technostress, increases teachers' job satisfaction, and consequently, their job performance. This approach deals with both the content and the feelings related to technostress, which helps to create a healthier and more effective teaching environment.

Discussion

In this study, we examine the phenomenon of technostress among teachers through the Conservation of Resources (COR) theory. The rapid adoption of technology in educational environments, intended to improve learning and efficiency, often results in a significant depletion of teachers' resources. Teachers find themselves under pressure to assimilate complex digital tools rapidly, a demand that frequently surpasses their current psychological and organizational resources. This imbalance leads to technostress, manifesting as cognitive overload, frustration, and anxiety, which then negatively impacts job performance and satisfaction (Ayyagari et al., 2011; Tarafdar et al., 2007). The implications of these findings highlight the essential balance required between technological advancement and the provision of adequate support resources.

The study further illustrates that technostress affects various demographic groups differently, notably impacting older educators and those less versed in digital technologies, indicating a need for demographic-specific interventions. The role of the institutional context is also significant; schools that lack adequate training and support systems intensify the resource gap and magnify the negative effects of technostress. Conversely, environments that provide extensive training and robust technical

support can alleviate these stressors (Ragu-Nathan et al., 2008; Salanova et al., 2013). By bolstering teachers' resources, educational institutions can convert potential stressors into opportunities for professional growth and educational excellence, thereby enhancing teacher well-being and the quality of education provided. This foundation allows us to explore specific, actionable strategies that can mitigate these challenges and foster a supportive educational environment.

Implications of the Study

The implications of the study are important for educational institutions that seek to improve the quality of teachers' well-being and performance by addressing the issue of technostress. Firstly, the focus on ICT literacy facilitation underlines the importance of the professional development for teachers that would provide them with the necessary knowledge and experience in the use of ICT. In this way, schools can decrease the stress and the level of frustration that is linked to new technologies and increase the job satisfaction and the performance (Ioannou et al., 2024; Joo et al., 2016).

Secondly, the direct involvement of teachers in the process of designing as well as implementing ICT systems in their classrooms can also help in the development of less complex technology solutions in teaching. This ensured that the developed technology fulfilled the needs expressed by the teachers, which also reduced cases of technostress and technology resistance as explained by Salo et al., 2018. It can also result in better feedback systems because of the periodic assessment and modification of ICT tools depending on the feedback from the users (Ioannou et al., 2024).
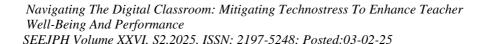
However, delivering effective technical support is all the more important to tackle daily and practical issues that teachers come across as they implement technology into their classroom practices. Supporting teachers to and providing access to technical teams and support communities enables the teacher to solve technical problems faster and, in the process, reduces stress from unsolved technical issues (Hung et al., 2015). They not only help to release the pressure on the present-day but also play a role in a healthier school climate in which the teachers are cared for and appreciated (Cökçar & Efilti & Çoklar, 2019; Özgür, 2020).

Thus, the necessity of the multifaceted approach towards technostress management is emphasized, including the facilitation of ICT literacy, teachers' engagement in ICT design and implementation, and effective technical support. Altogether, these strategies serve to strengthen the capacity of teachers to contend with the technological requirements which in turn increases the job satisfaction and performance levels among the teachers. This intervention should be of interest to the educational policymakers and school administrators in order to enhance the supportive and sustainable teaching environment (Joo et al., 2016; Li & Wang, 2021).

Limitations and Future Research Directions

Since the study is conceptual in nature, it does not include empirical evidence and primary data collection and analysis, which hinders the possibility of testing the proposed relationships and strategies in practical contexts. The paper is more theoretical as it mainly focuses on the literature review and the analysis of the theoretical concepts that can be a limitation since it does not provide a comprehensive understanding of the technostress phenomenon from the teachers' perspective in different settings. Therefore, the results and the outlined recommendations may not be generalizable to all learning settings, especially those that have specific technological or organizational requirements. Furthermore, the use of the Conservation of Resources (COR) theory and other theories may not capture all the aspects of technostress, thus leaving out other possible explanations and antecedents of technostress.

Further studies should seek to test the theoretical propositions of this conceptual paper using primary data collection techniques like questionnaires or interviews with teachers to confirm the practical relevance of the conclusions. Carrying out experimental research to evaluate the efficiency of the suggested strategies for managing technostress can offer concrete data on the applicability of the proposed approach and its influence on teachers' well-being and productivity. Comparing technostress in different educational settings such as different countries, different levels of education

and different types of institutions can give a better picture of the phenomenon. Future research should establish how technostress and its effects change with time especially due to ongoing technological innovations and shifting practices in education.

Future research should also consider the ways in which various forms of educational technologies enhance or reduce technostress to design interventions based on the technological environment. Analyzing other variables like age, gender, experience, and cultural background can help to identify which groups of teachers are most at risk and why. Also, exploring the psychological and physical health effects of technostress can assist in creating effective intervention strategies that will support teachers' psychological and physical health. Last but not the least, exploring the second-order impact of technostress on students' learning outcomes through the intermediary of teacher performance and well-being can shed light on the general educational consequences of technostress.

Conclusion

In this research, the effects of technology usage on teachers have been discussed with emphasis on technostress and its negative effects on job performance and job satisfaction. From the literature review, it is clear that technostress, which includes techno-overload, techno-invasion, techno-complexity, techno-uncertainty, and techno-insecurity, is a major concern for teachers. These stressors not only reduce the effectiveness of teachers but also affect the teachers' health and well-being, which in turn reduces their job satisfaction and increases their turnover intentions (Saleem et al., 2021).

In order to avoid these negative effects, the following measures have been suggested. ICT literacy can be improved through professional development programs and learning that is continuous; this will make teachers more confident and competent in the use of digital tools and this will in turn reduce the level of technostress (Joo et al., 2016; Li & Wang, 2021). The use of teachers in the development of ICT systems helps in creating systems that are easy to use and relevant to the teachers' needs hence creating an ownership and control over the systems developed (Salo et al., 2018). Having technical support in the form of teams and peer support groups ensures that teachers are able to solve technical problems quickly thus minimizing on the time wasted and stress that comes with it (Hung et al., 2015). The study therefore supports the need for a multi-faceted approach to managing technostress which includes; ICT literacy facilitation, teachers' involvement in ICT design and effective technical support. Schools that consider these interventions can foster an environment that improves the teachers' ability to handle technological pressures, thus increasing their job satisfaction and productivity. Such an approach is necessary for the formation of a healthy and productive educational climate in the context of the constant development of new technologies (Ioannou et al., 2024; Özgür, 2020). Therefore, it is crucial to manage technostress in order to maintain the health and productivity of the teachers. Through the application of specific intervention measures to reduce technostress, educational organizations will be in a position to enhance the ability of teachers to deal with the issues arising from technology integration in learning institutions which will be of great benefit to the whole education system.

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