



## Original Article

# Technostress Level In Prospective Teachers At Higher Education Institutions

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## Abstract

*In the last two decades, most researchers have taken an interest to understand how technology affects negatively. It is extensively reported that techno stress is evoked due to technology among different groups like prospective teachers. This quantitative survey examined the technostress level of prospective teachers in the department of education using a validated technostress instrument. The findings of the study show that the used instrument was found valid to examine technostress with minor modifications and examining prospective teachers' moderate levels of technostress can affect their work performance in the class. The findings of the study found that final-year students have less technostress as compared to first-year students. Moreover, this study will be used as a potential reference in the context of Pakistan to know that if there is advanced technology then there might be the existence of technostress. This research study will provide awareness to the management of HEIs to overcome technostress among prospective teachers.*

**Keywords:** techno-stress, prospective teachers, higher education, work performance

## INTRODUCTION

Over the previous four decades, the use of technology has had a significant result in terms of greater process efficiencies, reduced operational costs, possibilities for innovation, and new strategic alternatives. Along with this, ICT advancements and ubiquity have spurred ICT adoption amid higher education institutions (HEIs). Technology has also played a positive and vital role to automate academic activities and improve the learning and teaching process. Because of government incentives and to match students' expectations, the usage of Technology-based Learning (TEL) has exploded in academic activities (Dunn & Kennedy, 2019). Systems of learning management and digital-based assessments are also integrated into the management attendance of the employees. Besides, students' higher education expenditures are also found to be reduced by online learning and Massive Open Online Courses (MOOCs) and students have a good attitude toward technology-based learning (Barana & Marchisio, 2016).

Moreover, It is thought that incorporating technology into the classroom will enhance the learning and teaching process effectively (Fauzi, et al., 2016). Although the benefits of technology are unquestionable and there is an increasing interest in learning about the adverse effects of technology on users, the incapacity to adapt to advanced technology has been widely researched in studies (Nisafani, et al., 2020). On the other hand, technostress harms the behavioural and psychological outcomes of the students, including the production that affects students' learning has also been found to counter effects on the productivity of human beings as employees (Tiwari, 2021). At an early age, adults have studied concerning technostress (Torales, et al., 2022). Moreover, technostress among learners has become the reason for their dropout, and deviation from learning or academic work, and has caused a high burden on them. However, this new generation has different characteristics and habits regarding technology that direct to study the reason in depth as students in higher education have different perspectives regarding technology as per their expectations (Ashour, 2020). Although the transition to the information age adaptation has been quick yet, it is stressful for some people and they fail to adopt it.

Besides, different settings of demographic were experienced at different levels either positive or negative outcomes for learners. Through technology, students increase their learning and interpret their performance (Razzaq, et al., 2018), but the current generation has a unique combination of qualities and habits, making them an intriguing group. Higher education works to transfer knowledge by introducing technology and ensuring students take different landscapes of learning to succeed academically (Wang, et al., 2020b). Such widespread use of technology has led to the emergence of phenomena, harmful to users in the form of technostress. Although it is studied in different contexts yet, pending to know its impacts on the higher education environment where its use is widely spread (Penado et al., 2020). Due to high academic expectations, the use of technology has been enhanced with its importance in higher education and the students have experienced unprecedented benefits while experiencing technostress as well due to increased technological requirements (Wang et al., 2020b). Increasingly, it influences insecurity in students and affects their performance to a great extent (Abd Aziz, et al., 2021). It has been seen that technostress harms students' academic performance and decreases productivity (Upadhyaya, 2021). Keeping this in mind, some specific measures are necessary to study to improve students' coping with the challenges of technology and technostress that must be promoted (Torales et al., 2022).

## Objectives of the Study

- To analyze the technostress level among prospective teachers
- To analyze the difference in technostress level between the first year and last year prospective teachers

## Research Questions

- What is the level of technostress among prospective teachers?
- Is there a difference in technostress level between the first year and last year prospective teachers?

Accordingly, the following research hypotheses guided our study

$H_0$  There is no significant difference between the technostress level of prospective teachers in the first and last year.

## LITERATURE REVIEW

According to Delahoy et al., (2020), who conducted a study during the pandemic, experienced that many teachers reflected on experienced virtual teaching, which impacted their performance negatively due to the sudden use. Abdelfattah et al., (2023) reflected that the pandemic situation had impacted students with an intriguing explanation of technostress. In this scenario, technostress might be regarded as a relevant element that may have an impact on student performance and satisfaction. During the breakout of Covid-19 experienced technostress due to the sudden use of virtual teaching, which impacted their teaching performance negatively (Abdelfattah et al., 2023). According to Ragu-Nathan, et al., (2008), senior managers experienced less technostress as compared to junior workers. Previously, it was termed as an individual psychological response to a circumstance.

According to Tarafdar, et al., (2007), these factors are the circumstances that arise from the technical stressor and social role by using socio-technical and role theory. Technostressors are also discussed (Nisafani et al., 2020) which demand high physical, social, and cognitive skills associated with psychological costs as well. Stress is a cognitive state that a human experiences when an environmental circumstance appears to create pressure to overstep the resources and a person's potential for satisfying it. Stress makers are factors that cause stress. Task stressors play a significant role besides the usage of ICTs, which can also be the cause of stress (technology stressor). Along with different investigations, the current study focuses solely on technostress in education, which is an uncommon phenomenon. Under the umbrella of technology ambivalence, different studies also spread the idea of technostress, which considers the use of social media as a beguilement in the acquisition of academic learning. The common use of social media is used to communicate, share, and collaborate, but it can be problematic due to the behaviour leading to negative outcomes (Brooks, et al., 2020).

There is little attention paid to the technological stress students face while using technology in their process of learning. During Covid-19, the introduction of open and distance learning (ODL) became an urgent need in all educational institutions. Most of the schools and universities had no other choice but to employ online learning and teaching methods, which they tried to deliver to the best of their capacity. According to Abdelfattah et al., (2023), during the breakout of the Covid-19 pandemic, the introduction of virtual teaching caused teachers to experience technostress. In addition, this type of experience impacted their teachers' teaching performance negatively and higher education institutes rapidly transitioned to online mode. COVID-19 impacted teaching-learning where there were inappropriate sources (Colclasure, et al., 2021).

This study; therefore, responded to investigate if there are any differences in the data gained. Technostress might be regarded as a relevant element that may have an impact on student performance and satisfaction. At the same time, relatively little research has been undertaken to date to investigate the co-occurring effects of technostress dimensions on students' performance and satisfaction expectancy. Around the world, most universities have been polishing their agendas for technology-enhanced learning (Wang, et al., 2020a) by implementing different types of blended learning and flipped classroom approaches. This new and digitalized mode of learning often requires more time management and self-effort skills and knowledge. Practitioners and researchers have described technostress as a dual-edged sword (Qi et al., 2019). The good and bad effects of technostress on individuals lead to varying consequences. Schlachter, et al., (2018) believe that technology makes tasks more portable and remotely accessible, resulting in increased employee performance, work balance, and job satisfaction.

Nonetheless, technology also harms organisational behaviour and psychological stress, known as

'technostress' which has been widely explored in the past (Tarafdar et al., 2007). Work performance and satisfaction are negatively impacted by technostress, which has been demonstrated through technostress level psychologically (Upadhyaya, 2021). In addition, there are other behavioural repercussions of technostress including burnout that studies have observed (Mahapatra & Pati, 2018). Such implications for physical health leads to blood pressure, headaches, stomach pain, fussiness, and heart problems. At this stage, technology proficiency is highly recommended, specifically the integration of technology into the educational process (Mokh et al., 2021). This negative impact causes burnout, decreased participation in learning activities, poor academic achievement, and an increased dropout ratio (Jena, et al., 2015). The P-T fit model has different characteristics of technology influence techno creators (stressors). This P-T fit model has three main components: technology characteristics, stressors, and strain. Technology attributes refer to features of a particular ICT; stressors represent factors or conditions that create technostress; strain refers to the behavioural, psychological and physiological outcomes of stress that are observed in individuals (Jena, et al., 2015).

## Technostress

The widespread use of technology in daily routine and workplace technostress is a serious concern; however, technology has made many human work duties easy. Various psychological problems are associated with the use of technology and those problems have increased due to technostress and are found in office and school environments (Sellberg & Susi, 2014). Stress due to technology is a psychological condition characterised by elevated amounts of cognitive issues or symptoms as well as hormones of stress such as lame focus, fussiness, and poor memory problems. The events, situations, and reasons that cause technostress are referred to as technostressors whereas, factors that might impact and intensify the effect of stressors on persons are known as antecedents (Dragano & Lunau, 2020). The condition can be classified as work-related or non-work-related, due to which technostress develops. Technostress can also be triggered by the immense use of social media networks or social media addiction that determines the condition, which is a type of behavioural and psychological dependence on different social media platforms (Tarafdar et al., 2007). Due to its bad impact on productivity, work-related technostress has received increased attention and different techniques have been suggested (Khedhaouria & Cucchi, 2019). It is identified that much use of the mobile phone can enhance negative emotions in users, for instance, as anxiety and anger, although the average use of mobile phones mitigates this techno-stress (Hung & Min, 2020).

## Technostressors

It is stated that technostressors may be operationalized into five types, in an organisational environment like technological overload, technological invasion, technological complexity, technological insecurity, and technological uncertainty (Tarafdar et al., 2007). Techno-overload refers to situations in which the stress caused by technology leads to long time work hours at a speedy pace. Techno-invasion alludes to conditions in which workers are allowed to connect at any time, implying constant connectivity that might blur the distinction between the professional and personal regions. On the other hand, techno-complexity refers to a condition in which an individual sees technology to be more difficult to use and their abilities to be insufficient and thus feels to spend sufficient time to learn various things about technology. The job overload, work-home conflict, and role ambiguity to operationalize techno-stressors in an organisational context are a few examples. It is seen that two major areas of technostressors work-home conflict and work-load give rise to stress and strain that affects workers' job satisfaction (Camacho, et al., 2022). The increased workload as a result of the ICTs is referred to as a work overload stressor. The ability to work from home is enabled by ICTs because the work-home conflict directs the unfocusing of boundaries between the office and the home. The difficulty in prioritising work-related responsibilities as a result of ICTs is referred to as role ambiguity.

## Conceptual Framework

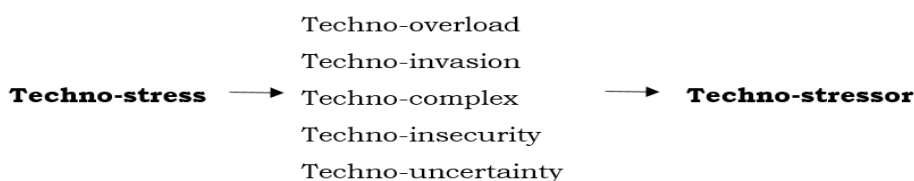


Figure. 1. Conceptual Framework

## METHODOLOGY

This cross-sectional study adopted a quantitative survey design. This study was conducted in a Higher Education Institution where ICT is used as one of the subjects at the undergraduate level and a prospective teacher has to pass a mandatory course. Techno stress was measured using a modified scale comprising a 19-item scale proposed by Tarafdar et al., (2007). The scale was modified to match the academic research context. The changes done to the original instrument were elaborated in a separate section and the researcher personally shared the questionnaire in the class with 80 prospective teachers (undergraduates). For data collection, a five-point Likert scale tool was used for administrating in hard copy as well as on Google form. Finally, the collected data were tabulated for descriptive and inferential analysis using SPSS 25.

### Scale Validity and Reliability

The reliability of this survey tool was checked through Cronbach’s Alpha value. Table 1 shows the reliability value of each construct. The Cronbach’s Alpha values of Techno-overload, techno-invasion, techno-complex, techno-insecurity, and techno-uncertainty were found .732, .846, .432, .879, and .901 respectively. Thus, each of the constructs was considered reliable.

**Table 1**

Scale Validation & Reliability

Variable	CA	CA Based on Standardized Items
Techno-overload	0.732	4
Techno-invasion	0.846	3
Techno-complex	0.432	5
Techno-insecurity	0.879	3
Techno-uncertainty	0.901	4

Note. Adapted from Tarafdar technostress level scale

CA = Cronbach’s Alpha

### Normality of Data

Technostress level among prospective teachers has been identified through a survey. The key factors are considered as the main paradigm to determine the technostress level of students. Furthermore, analysis of the survey was done by using SPSS 25.0 in which detailed descriptive (mean, and std) and inferential (Mann Whitney U test) analyses were performed. The normality was determined using the Shapiro-Wilk test (Hanusz, et al., 2016). This test was applied to determine the normality of data (Ghasemi & Zahediasl, 2012). The data did not show a normal distribution with a p-value below 0.05. Furthermore, analysis of the survey was done by using an inferential Mann-Whitney U test (See Table 2).

**Table 2**

Data Normality

	Year	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
TOL	First Year	.370	40	.000	.682	40	.000
	Last Year	.122	40	.138	.966	40	.271
TIV	First Year	.375	40	.000	.667	40	.000
	Last Year	.128	40	.095	.938	40	.030
TEC	First Year	.294	40	.000	.883	40	.001
	Last Year	.116	40	.193	.968	40	.304
TEINS	First Year	.426	40	.000	.648	40	.000
	Last Year	.132	40	.075	.966	40	.275
TECUN	First Year	.382	40	.000	.653	40	.000
	Last Year	.136	40	.061	.945	40	.053

a. Lilliefors Significance Correction

Note: TOL= techno overload, TIV= techno invasion, TEC= techno complex, TEINS= techno insecurity, TECUN= techno uncertainty

Further, for testing the hypotheses, the Mann-Whitney U test was used to find out the difference between the technostress level between responses of first-year and last-year students, while the assuming value Sig p 0.05 showed that there was a difference between the level of technostress which implied that  $H_0$  is rejected.

## RESULTS & FINDINGS

It was found that the null hypothesis was rejected which indicates that students had high technostress levels as techno-overload. It also shows that there is a meaningful difference between first-year and final-year students. Table 3 shows each constructs' mean and standard deviation. The mean values of most of the constructs show that students have high technostress levels and thus it supports the stated hypothesis overall. The findings show that there is a mean difference between the first-year and final-year students in the techno-invasion, indicating that there is more technostress in the first year as compared to the final year.

**Table 3**

TechnostressOverload Statistics

Constructs	Mean	STD	Year wise mean	
			First-year	Last year
Techno-overload	3.35	0.92	3.64	3.05
Techno-invasion	3.21	0.96	3.46	2.95
Techno-complexity	3.35	0.85	3.37	3.33
Techno-insecurity	3.43	0.97	3.60	3.26
Techno-uncertainty	3.29	0.99	3.50	3.07

## Discussion

Principally, the objective of this study was to find out the stress level among first-year and last-year prospective teachers. The technostress varies among undergraduates due to their educational competencies level, but it mostly affects early year students with different shapes as it is characterized as a modern sickness of adaptation produced by an incapacity to cope with new computer world technologies (Salazar-Concha, et al., 2021). Hence, it is a very serious issue that technology-enhanced learning in different institutions may affect negatively students' academic performance especially educators who are committed to preparing their students for technology-based learning. In this scenario, it is a compulsion to evaluate whether the students have technostress at different levels. The finding reveals that during the breakout of the Covid-19 pandemic, many people experienced technostress due to the sudden use of virtual teaching, which impacted their performance negatively (Abdelfattah et al., 2023). Findings reveal that senior prospective teachers experienced less technostress as compared to juniors. Additionally, final-year students who had more experience and knowledge about the technology were less stressed due to their learning experiences (Abdelfattah et al., 2023).

## CONCLUSION & RECOMMENDATIONS

Advanced computer technology, developed hardwares, databases, telecommunication, and the internet have had a broad impact on society, especially on novice prospective teachers in higher education, as it is not easy to adapt to new technology. While the benefits of technology are unquestionable, there is an increasing interest in learning about the adverse effects of technology on users. The incapacity to adopt advanced technology in the form of technostress has been widely researched including its impact on job outcomes. Moreover, this study of technostress among first-year and final-year prospective teachers shows that there is an impact of technostress on students' performance. It has a potential reference in the academic context to provide awareness to the management of HEIs to overcome such activities, which occur in the form of technostress among prospective teachers.

## Implications

This study contributes to the literature on prospective teachers' techno stress levels that supported an important theoretical contribution to cross-validating the technostress instrument of Tarafdar et al. (2007). However, there is a need to improve the techno-insecurity scale for better reliability and accuracy in the academic context. For practical implications, it is necessary to implement technology in HEIs regularly.

## Competing Interest

The authors have declared no competing interest.

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