

Examination of Technostress in Advanced EFL Learning Environments Among Male and Female Teachers

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ABSTRACT

This study examines the psychosocial aspects of technostress among male and female English teachers in advanced learning environments in Iran. The study emphasizes the impact of the increasing utilization of digital tools—such as computers, smart boards, and tablets—on the pedagogical environment in which these educators work. This study employs a mixed-methods approach, integrating correlational research with qualitative analysis to investigate the relationships between technostress and some of the factors including job performance, job satisfaction, and career commitment. A sample of 120 EFL teachers, equally distributed by gender and aged 25-40, was selected from private educational institutions in Urmia, West Azerbaijan province. The participants were chosen via convenience sampling to ensure a representation of both novice and seasoned educators who are actively incorporating technology into their pedagogical practices. The findings indicated that teachers encountered a moderate degree of technostress while exhibiting elevated levels of work performance, job satisfaction, and career commitment. A substantial negative correlation was found between technostress and work performance; however, no such correlation existed with job satisfaction or career commitment. Qualitative data indicated that techno-overload, techno-invasion, and a perceived disconnection from students were significant stressors. The results show that EFL teachers have moderate levels of technostress, with higher levels in certain demographic groups and a clear negative effect on their work performance. These results show that we need more targeted interventions and better support systems to reduce technostress and keep the quality of education high in classrooms that use technology.

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Introduction

The educational environment has experienced rapid change because of technological advancement which established digital learning environments which support various student needs (Pandey et al., 2023). The educational field of English as a Foreign Language (EFL) has undergone a complete transformation because teachers now implement computer-based teaching methods which include smartboards and online assessment tools and multimedia applications. Educational institutions use technology to create personalized learning experiences for students through individualized educational methods (Ahmad et al., 2023) shows that technology deployment produces two separate effects which affect organizational work environments. Moreover, workplace technology adoption produces two opposing effects which affect organizational operations. Work environments must transform their operations to function with technology which results in technostress that produces psychological distress (Koseda et al. 2024; Brod, 1984).

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In the wake of the COVID19 pandemic, technology adoption in education intensified. The global transition to remote work began when institutions across Iran and worldwide institutions started their remote operations in March 2020 (Bowman, 2023; Brennan, 2021). The sudden shift to virtual and hybrid learning systems forced EFL teachers to adopt new teaching methods which required them to keep students engaged through remote communication. The combination of technological advancements and network problems and insufficient support services led to increased teacher technostress (Daud, 2025).

The research of Salanova et al. (2013) and Becker et al. (2022) demonstrated that technostress emerges because users encounter system performance problems and insufficient system resources which leads to emotional exhaustion and anxiety. Similarly, research within EFL contexts in Iran has shown that writing tasks provoked by anxiety lead to stress responses that are similar to those induced by technology overload (Mall-Amiri, 2024). Çoklar et al. (2016) and Penado Abilleira et al. (2021) revealed that technostress results from various factors which include personal restrictions and fast-paced work and organizational barriers and health problems. The research findings do not demonstrate how teachers experience stress when teaching advanced EFL classes because they must deal with multiple teaching difficulties simultaneously.

Research studies about technostress have described its effects but none have studied how gender interacts with teaching experience and institutional context to create these experiences. Research studies have produced conflicting results about how gender affects the situation. The research by Marchiori et al. (2018) showed that men and women solve technological problems differently yet it did not identify the core reasons which produce these differences. The research by Russo et al. (2025) and Erdoğan et al. (2022) found that men demonstrated superior technological abilities and lower anxiety levels yet women developed more severe emotional problems because they needed to perform various tasks while dealing with social expectations. The research studies maintain a descriptive nature because they fail to provide sufficient contextual information about Iran's private EFL institutions which operate under distinct cultural and organizational and technological frameworks than public schools and Western educational systems.

The private English institutes operating in Urmia within West Azerbaijan province now deliver their programs through digital platforms which allow them to develop curricula and perform virtual student interactions and assessments (Asadzadeh et al., 2021). Teachers encounter obstacles when implementing educational technology because their schools provide different levels of support and their teaching colleagues show different abilities when using digital tools. Social norms which affect how people view competence between men and women make these difficulties even more severe.

The knowledge of technostress in this specific environment becomes vital because it will enable teachers and students to improve their health outcomes and generate superior educational results through technology-based learning spaces. The research examines how technostress affects EFL teachers from both sexes who work at Urmia's advanced private educational institutions through their work performance and their job satisfaction and career dedication. It uses quantitative and qualitative methods to identify statistical patterns and personal accounts which describe technostress. It fills the existing knowledge gap through its gender-sensitive investigation which studies the situation to generate fresh theoretical knowledge that will produce successful solutions. The study undertakes to address the following questions:

1. What levels of technostress, work performance, job satisfaction, and career commitment do the EFL teachers experience?
2. Are there differences in technostress, work performance, job satisfaction, and career commitment among male and female EFL teachers?
3. Does a significant relationship exist between technostress and the work performance, job satisfaction, and career commitment of EFL teachers?
4. How do teachers perceive the impact of technostress on their teaching effectiveness, commitment to their profession, and overall job satisfaction when integrating new technology into their classrooms?

Literature Review

Conceptual Background of Technostress

Technostress refers to psychological strain produced by individuals' difficulty in adapting to rapidly changing information and communication technologies (ICT) in their professional environments. Initially defined by Brod (1984) and expanded by Tarafdar et al. (2007, 2019, 2020) consists of five essential elements which include techn overload, technoinvasion, technocomplexity, technoinsecurity, and technouncertainty. Teachers experience multiple types of stress because their technological abilities do not meet the expected standards according to the three dimensions. The research used Tarafdar's framework to develop the Technostress Scale which it applied to study how technostress affects psychosocial factors.

The research on technostress in psychology demonstrates that personal traits between different people and their work environment demands result in the development of this condition (Wang et al., 2020). The way educators view technological change through cognitive appraisal between threat and challenge will produce their emotional responses which include anxiety and fatigue and inefficacy (Li & Wang, 2021; EstradaMuñoz et al., 2020; Kashef & Khabazian, 2026). Teachers who lack digital literacy skills and insufficient institutional backing experience higher stress levels because they must acquire new competencies while they need to transform their educational approaches (Dong et al., 2020). The research results show that technostress exists as a combination of emotional responses and cognitive processes and organizational elements

EFL teachers experience rising technostress because they need to use technology more frequently throughout their teaching work (Wang et al., 2022). The term technostress in this context describes the stress and anxiety that teachers develop when they use technology for educational purposes. The research by Dong et al. (2020) demonstrates that teachers face technostress because they need to acquire skills for operating modern educational technology systems. From a psychological standpoint, it concerns the dynamic relationship between an individual and his or her environment; people can have positive or negative attitudes towards a new setting (Wang et al., 2020). Recent research has explored a related psychological construct, teacher immunity, defined as a teacher's psychological shield against stress-inducing factors. Productive immunity safeguards well-being, while maladaptive immunity can lead to cynicism and resistance to change (Khalili, Zohrabi, & Dobakhti, 2025). This construct provides a valuable lens for understanding how teachers' long-term psychological adaptation, shaped by factors like emotion regulation and work engagement, may influence their vulnerability or resilience to stressors like technostress.

Technostress in Educational Settings

Education institutions worldwide have started using modern educational technology which has created conflicting results regarding teaching performance and teacher mental health. The research by Wang et al. (2022) and Becker et al. (2022) established that ICT-related work pressure creates negative effects on teacher psychological well-being. The effects of teacher burnout differ between teaching specialties and educational settings which indicates that specific circumstances play an essential role. The research by Salanova et al. (2013) found that excessive exposure to digital content leads to exhaustion, while Çoklar et al. (2017) demonstrated that unstructured technology implementation methods result in operational inefficiencies. The research by EstradaMuñoz et al. (2020) confirmed the measurement validity of technostress through statistical scales which he developed for educational settings based on his theoretical framework that this study adopted for conceptual alignment.

The digitalization process in Iran has brought educational expansion to public and private schools yet there is insufficient research about how this change affects language teaching professionals psychologically. Studies by Mokh et al. (2021) and Fathali et al. (2024) demonstrated that teachers who get support from their institution develop better adaptive capacity and technological self-efficacy which helps them manage technostress intensity. Moreover, when anxiety is tied to completion of a task in digital platforms, perceived lack of control among learners adds up to stress levels (Mall-Amiri, 2024). Although the study by Mall-Amiri (2024) focuses on learners, the results can be applied to the experience of teachers when they encounter the same situation. The research by Muslimin et al. (2023) found that lack of training and peer learning opportunities increase fatigue and skepticism toward technology. The research results show that psychosocial elements together with environmental factors need to be studied because they connect technostress to job satisfaction and career commitment according to the current study. This is particularly the case when synthetic versus analytic AI writing tasks are considered in depth which create uncertainty among Iranian EFL teachers reporting that they felt incompetent in embedding such tools into their educational agenda without clear institutional guidelines (Teimourtash, 2024).

Furthermore, context-specific research in Iran highlights that work pressure and job stress negatively correlate with teacher immunity, a key psychological resource (Zohrabi & Paydar, 2025). This suggests that the stressors inherent in technology integration (techno-overload, invasion) could directly undermine the very immunity needed to cope with them. Comparative studies also indicate that Iranian EFL teachers may develop less productive immunity compared to Western counterparts, potentially making them more susceptible to the negative psychosocial impacts of technostress (Khalili et al., 2025; Zohrabi & Khalili, 2024).

Technology brings numerous advantages to users but it also creates multiple obstacles for them to overcome. Students who lack technical skills experience frustration when they try to use technology (Niu et al., 2022). Teachers require suitable training to achieve effective technology implementation in educational settings because insufficient training stops technology from delivering its complete educational benefits. The research on technology effects on EFL teaching methods and student learning needs requires immediate investigation (Yang et al., 2023).

Gender Differences in Technostress

Technostress affects people differently based on their gender and age and their level of experience with technology. The level of technostress intensity which people experience depends on their

gender identity. The research of Erdoğan et al. (2022) and Russo et al. (2025) revealed that male teachers possessed better digital tool skills yet women teachers showed greater digital tool anxiety and self-doubt. The research by Dwivedi et al. (2024) and Wang & Yao (2023) studied through their research how female teachers experience exhaustion because of their domestic duties which then affects their work productivity. The research findings from Akbana et al. (2022) show that social and cultural aspects control how people take up new technology because they investigated this phenomenon in Iran. Afsharpour et al. (2023) examined how gender influences employees' ICT technology adoption and their maintenance of work-life balance. The research by Wang & Li (2019) demonstrates that teaching experience and age level determine the amount of stress teachers experience when they need to fulfill different system requirements. Yangöz et al. (2023) demonstrated that teachers who have experience with teaching develop stronger coping strategies when they receive support from their institutions.

Research studies have collected many empirical findings but most investigations avoid studying complex EFL learning settings which teachers must handle their teaching responsibilities and technological challenges. This research gap allows this study to investigate how technology affects male and female students who study at private language institutions in Urmia.

Linking Technostress to Work Performance, Job Satisfaction, and Career Commitment

Research findings show that technostress produces performance effects which occur directly and through multiple intervening factors which affect the connection between them. The research by Tarafdar et al. (2010) used statistical methods to prove that employees experience decreased productivity because of techn overload and techn uncertainty which disrupt their ability to focus and make decisions. Pepe (2011) and Akinwale & Okotoni (2019) discovered that job satisfaction and career commitment and workplace stress create vital connections which affect educators. The research unites these frameworks to show that increasing technostress will negatively affect EFL teachers' work performance but will not significantly affect their job satisfaction or career commitment because they demonstrate professional resistance and maintain their internal motivation to work. The concept of teacher immunity offers a potential explanatory mechanism for these relationships. A teacher with productive immunity, fostered by factors like emotional intelligence and psychological well-being, may be better equipped to withstand technostress, thereby protecting their performance, satisfaction, and commitment (Zohrabi & Khalili, 2024; Khalili et al., 2025). Conversely, high technostress could erode this immunity, leading to maladaptive outcomes.

The Research Gap

The research shows that technostress develops through the interaction between personal attitudes and both workplace rules and cultural standards of the community. Research on international and Iranian studies has identified basic links between technostress and work results but there is limited scientific evidence about how this affects EFL students in advanced learning settings of private institutions especially regarding gender differences in psychological responses. The current research lacks a complete statistical and qualitative analysis which studies how technostress affects performance and job satisfaction and career commitment in Urmia. The research fills this knowledge gap through Tarafdar's model expansion and evidence-based development of guidelines which validate gender-sensitive educational methods.

Method

Research Design

This study employed quantitative correlational methods together with qualitative data analysis to achieve its research objectives. The research design allowed the researcher to study multiple elements through organized assessment which used mixed-method approach, integrating correlational research with qualitative analysis investigated how technostress impacts performance based on particular traits of advanced male and female EFL teachers (Coklar et al., 2017). The quantitative section of the study produced statistical patterns while the qualitative assessment revealed detailed teacher perspectives.

Participants

The research involved 120 EFL teachers between ages 25 and 40 (60 male, 60 female) from Urmia Iran working at private educational institutions. The researcher used convenience sampling to select participants because it allowed to study both new and experienced teachers who used technology in their teaching methods. The teachers who participated in the study used digital educational tools which included computers and smart boards and tablets for their teaching work. The institute administrators checked both teaching qualifications and teaching experience of all research participants.

Table 1.

Demographic Information of Participants

DEMOGRAPHIC CATEGORY	SUBGROUP	FREQUENCY (N)	PERCENTAGE (%)
Gender	Male	60	50
	Female	60	50
Age Group	25-30 years	40	33.3
	31-35 years	50	41.7
	36 years and above	30	25.0
Teaching Experience	0-5 years	35	29.2
	6-10 years	45	37.5
	11 years and above	40	33.3

Instruments

Questionnaire: The first section of the survey collected information about the participants' background characteristics. The Technostress scale from Estrada-Muñoz et al. (2020) consisted of 16 items which measured skepticism, fatigue, anxiety, and ineffectiveness through a 0-6 frequency rating system. The research employed 5-point and 4-point agreement scales to assess job performance (Tarafdar et al., 2010), job satisfaction (Pepe, 2011), and career commitment (Akinwale and Okotoni, 2019).

Interview: To make sure that the interview script was effective in capturing experiences of educators, a robust theoretical foundation was used to develop it methodically. For this purpose, questions were directly adapted from a validated instrument used in prior technostress research, and then they were refined with context-specific prompts to encourage eliciting detailed personal and professional accounts from teachers. The researcher conducted 20 semi-structured interviews to obtain personal and professional insights which went beyond what quantitative data could show. established interview questions from previous education technostress study were applied to achieve both relevant and credible results.

Procedure

Data collection process was performed in two distinct stages. The questionnaire was distributed online and allowed to reach participants efficiently (Braun et al., 2021). Before participating, respondents received details about the study objectives and procedures and ethical issues which ensured their right to voluntary participation with absolute confidentiality protection. Also, the research design used quantitative and qualitative methods to validate results through data triangulation which connected numerical data to qualitative findings. Subsequently, interviews were conducted by experienced teachers to foster a comfortable atmosphere and encourage candid discussions. Purposive sampling technique was used to choose participants based on two primary criteria: those who reported high levels of technostress, and those who voluntarily expressed willingness to be contacted for a follow-up interview. Interviews were conducted online through a secure video-conferencing platform, and lasted approximately 15 to 20 minutes.

Data Analysis

Descriptive statistical analysis of survey data through mean calculations and frequency measurements was performed. The research used an independent sample t-test to evaluate how technostress, job performance, job satisfaction and career commitment differ between groups. The research employed Pearson's product moment correlation coefficient to analyze the connections between technostress and its associated factors. To analyze data from interview transcripts, a hybrid approach of deductive coding and the inductive coding of emerging themes from the interviews was adopted to perform thematic analysis of ideas that were expressed by participants. These codes were then grouped and analyzed.

Results

The quantitative and qualitative findings of the study, organized around the four research questions, are presented below. The research investigates how technostress affects work performance and job satisfaction and career commitment among male and female EFL teachers through quantitative data analysis. The qualitative data provides additional understanding about technostress effects through teachers' individual accounts of their psychological and social experiences in advanced EFL learning environments.

Technostress, Work Performance, Job Satisfaction, and Career Commitment

Table 2 presents the descriptive results of technostress by its four sets: skepticism, fatigue, anxiety, and inefficacy.

Table 2.

Level of technostress by set

Variable	Mean	Description
Technostress - Skepticism set	3.261	Sometimes
Technostress - Fatigue set	3.340	Sometimes
Technostress - Anxiety set	2.900	Sometimes
Technostress - Inefficacy set	2.672	Rarely
Overall Technostress	3.043	Sometimes

The research data in Table 2 shows EFL teachers experience technostress at moderate levels ($M = 3.043$). The fatigue shows the highest mean value at 3.340 which indicates teachers experience mental exhaustion after working with ICT tools. Teachers experience skepticism ($M = 3.261$) and anxiety ($M = 2.900$) which leads to occasional technology-related frustration and nervousness. The majority of teachers show low levels of inefficacy because they rate it as "rarely" occurring ($M = 2.672$). The research shows that EFL learning environments with contemporary technology infrastructure experience standard technostress levels because technology serves as their fundamental operational base.

Differences Based on Demographic Characteristics

Table 3 displays the overall levels of work performance, job satisfaction, and career commitment among teachers.

Table 3.

Levels of work performance, job satisfaction, and career commitment

Variable	Minimum	Maximum	Mean	Description
Work Performance	1.00	5.00	4.229	Strongly Agree
Job Satisfaction	1.00	5.00	4.066	Agree
Career Commitment	1.00	4.00	3.488	Strongly Agree

The teachers show high career commitment ($M = 3.488$) and exceptional teaching abilities ($M = 4.229$) but their job satisfaction scores average at 4.066 which highlights their positive relationships with students and their contentment with teaching. The values demonstrate teachers uphold professional standards at high levels while showing contentment with their work despite experiencing typical technostress problems.

Table 4.

Difference in the technostress by set

Sample Characteristics	Technostress							
	Skepticism		Fatigue		Anxiety		Inefficiency	
	M	P	M	P	M	P	M	P
Age								
25 years and below	3.25	0.000	3.16	0.000	2.81	0.000	2.49	0.000
26-35 years	3.32		3.24		2.83		2.62	
36 years and above	3.52		3.46		3.14		3.06	
Gender								
Male	3.32	0.180	3.22	0.010	2.87	0.042	2.63	0.006
Female	3.41		3.40		3.01		2.82	
Marital Status								
Single	3.24	0.017	3.17	0.25	2.85	0.193	2.58	0.033
Married	3.38		3.30		2.92		2.71	
Teaching Experience								

0-5 years	3.27	0.004	3.18	0.000	2.83	0.000	2.55	0.000
6-10 years	3.43		3.39		2.90		2.74	
11 years and above	3.49		3.42		3.17		3.08	

Table 4. demonstrates that teachers between 36 years old and above show higher technostress levels across all four assessment categories. Moreover, female and married teachers and those with more than 11 years of experience undergo higher levels of fatigue, anxiety, and inefficacy than others. The research shows that experienced teachers with particular and personal circumstances face greater psychological difficulties when working with new technology systems.

Table 5 provides further detail on how demographic characteristics relate to overall technostress and the three outcome variables—work performance, job satisfaction, and career commitment.

Table 5.

Difference in overall technostress, work performance, job satisfaction, and career commitment

Sample Characteristics	Technostress							
	Overall Technostress		Work performance		Job satisfaction		Career commitment	
	M	P	M	P	M	P	M	P
Age								
25 years and below	2.93	0.000	4.18	0.034	4.04	0.002	3.40	0.000
26-35 years	3.00		4.25		4.04		3.51	
36 years and above	3.30		4.28		4.13		3.61	
Gender								
Male	3.01	0.011	4.21	0.100	4.06	0.616	3.50	0.000
Female	3.16		4.28		4.07		3.40	
Marital Status								
Single	2.92	0.019	4.16	0.005	4.06	0.792	3.41	0.000
Married	3.04		4.26		4.06		3.52	
Teaching Experience								
0-5 years	2.96	0.000	4.19	0.027	4.04	0.001	3.42	0.000
6-10 years	3.11		4.26		4.05		3.54	
11 years and above	3.29		4.30		4.16		3.66	

As can be seen, female teachers 36 years old or older who are married and have more than 11 years of experience go through higher levels of technostress. But the groups with higher technostress levels also demonstrate better work performance and career commitment and slightly elevated job satisfaction. Teachers who have experience and strong motivation can cope with stress even when their technostress levels rise.

Technostress and Professional Variables

Table 6 reveals a significant negative correlation between technostress and work performance, meaning that higher technostress is associated with reduced productivity and efficiency.

Table 6.

Relationship between technostress and career commitment, work performance, and job satisfaction

Variables	Work performance	Job satisfaction	Career commitment
Technostress- Skepticism set	-0.111 0.000	-0.035 0.093	-0.030 0.152
Technostress - Fatigue set	-0.112 0.001	0.070 0.175	0.070 0.548
Technostress - Anxiety set	-0.125 0.000	0.028 0.176	0.000 0.986
Technostress - Inefficacy set	-0.150 0.000	0.019 0.367	0.004 0.863
Overall Technostress	-0.115 0.000	0.024 0.252	0.013 0.538

The research data shows that inefficacy has the most significant negative relationship ($r = -0.150$, $p = .000$) followed by anxiety and fatigue. However, no significant relationship exists between technostress and job satisfaction or career commitment, implying that work-related stress affects performance but teachers stay dedicated to their profession while keeping their job satisfaction levels high.

Teachers' Perceptions of Technostress

The qualitative findings further explain the quantitative patterns. Results of interviews with 20 teachers demonstrated that how they experienced and managed technostress was influenced by personal attitudes, self-efficacy, and peer support. It was stated by many participants that their stress was reduced after gaining confidence with ICT tools. As one male teacher said, “When I feel confident using the tools, I find it easier to teach and connect with my students.” In the same vein, collaboration among colleagues was found to be a key factor in mitigating stress: “Sharing tips and strategies with my colleagues has made a big difference.”

However, the teachers remained skeptic about technology. Some challenged the educational value of technology, as one expressed, “I often wonder if all this technology really helps my students learn better.” Reduced classroom interaction, as well as feeling disconnected during online

teaching were factors that triggered this skepticism and induced anxiety: “I get nervous because I can’t see how my students are responding.”

Techno-overload and techno-complexity were also found to main stressors. Participants claimed that the experienced fatigue and frustration when they had to learn to use new applications and manage multiple platforms (e.g., Google Meet, WhatsApp, Facebook) simultaneously. As one teacher said, “I spend a lot of time preparing and responding online—it’s complicated and stressful.” Others preferred familiar tools: “I just want to use what I’m familiar with.”

In cases when technology disturbed work–life balance, teachers reported techno-invasion. Majority of them had to prepare lessons at home and felt emotionally exhausted, as noted by one participant: “I have to work from home to prepare activities, and it stresses me out because there are no set working hours”. What exacerbated this emotional strain linked to digital work environments was that teachers felt they were isolated from others during online sessions.

Quantitative findings were supported by demographic trends in the interviews. Greater levels of technostress were reported by older, more experienced, married, and female teachers. A female participant said, “I often feel stressed because I have to keep up with new tech, and it feels like too much.” Similarly, an experienced male teacher added, “The constant changes in technology make me anxious.”

Table 7.

Thematic codes from interviews

Main Theme	Sub-Theme
Personal & Professional Drivers of Technostress	Internal Factors (Attitude, Skills, Self-Efficacy)
	External Factors (Techno-Overload & Complexity)
Impact on Teaching & Student Connection	Reduced Interaction & Disconnection
	Doubts in Teaching Effectiveness
Consequences for Well-being & Work-Life Balance	Psychological Impact (Anxiety & Fatigue)
	Techno-Invasion & Social Isolation
Moderating Demographic & Experiential Factors	Experience, Age, and Gender
	Marital Status

Discussion

The research shows EFL teachers experience moderate technostress which manifests through four stress dimensions including fatigue, skepticism, anxiety and inefficacy. Teachers experience work-related technology stress which arises from their professional responsibilities but manage to maintain job satisfaction and career commitment. The research confirms earlier studies which

show the teachers experience psychological strain when using ICT but their personal motivation and professional ethics help them resist negative effects (Tarafdar et al., 2011; Wang & Li, 2019). This is in line with the findings of Brod (1984) who identified technostress as a modern condition which people can handle through their capacity to develop coping strategies and adaptive methods that boost their functional productivity.

Our findings reveal that technostress affects people differently based on their age, gender, and teaching experience. These dimensions demonstrate that female teachers who are more than 36 years old with teaching experience face the highest levels of technostress. People from different age groups and social backgrounds face challenges when adopting new technology because they tend to oppose change while handling their individual duties. The research findings support previous studies by Estrada-Muñoz et al. (2020) who found that older teachers and female educators experienced higher stress levels because of new ICT implementations which affected their fatigue and skepticism levels. The studies by Wang et al. (2020) and Khlaif et al. (2022) demonstrate that teachers who are older than 40 experience rising anxiety when they learn new educational technology because they must manage their family duties and follow social expectations. This study showed that teachers with more experience achieved better work results and maintained stronger career commitment which supported earlier research by Li and Wang (2021) that professional resilience, accumulated pedagogical expertise, and intrinsic motivation help reduce stress effects.

The research shows technostress negatively affects work performance because teachers experience excessive digital work responsibilities which exceed their ability to manage. The two performance predictors which produce the lowest performance levels are inefficacy and anxiety because teachers require emotional confidence and perceived competence to teach effectively in technology-enhanced classrooms. These findings confirm previous studies about technological self-efficacy because teachers who show ICT competence will maintain their performance stability under stressful conditions (Cancino et al., 2022; Saltan et al., 2024). The way technostress affects performance depends on individual mental characteristics which include self-efficacy and coping abilities (Tarafdar et al., 2019; Wang & Zhao, 2022). The findings also show teachers who value their teaching work continue their career commitment and job satisfaction despite experiencing technostress. The research by Jena (2015) and Erdoğan et al. (2022) demonstrate teachers maintain their professional identity and commitment which helps them overcome technological obstacles.

In the same vein, the qualitative data analysis results validated all the research findings which emerged from the quantitative analysis. Teachers reported experiencing fatigue and anxiety and feeling disconnected from their work which matched the quantitative aspects of technostress. The digital teaching expansion which extends beyond classrooms creates work-life balance problems for married and older teachers because they experience techno-overload and techno-invasion. The research findings validate Bhatta (2023) and Bhatta (2024) who discovered that teaching staff experience rising technology-induced stress because they need to handle their work and family responsibilities. The study demonstrates that psychological and social support systems decrease technostress as found by Moorhouse and Kohnke (2021) and Aktan et al. (2022) who reported that teachers with strong self-efficacy and peer collaboration and adaptive thinking skills experience lower stress levels. The research findings from qualitative studies show that educational environments which offer social learning spaces protect educators from negative impacts of fast technology adoption (Yangöz et al., 2023; Fathali et al., 2024).

The research data shows that participants experience high levels of technostress yet their work performance shows signs of improvement. The combination of technological work demands and employee exhaustion seems to oppose the improved operational performance and staff involvement which results from appropriate technology administration. This is in line with findings of Tarafdar et al. (2019) who defined “techno-eustress” as a state of moderate stress that drives adaptive learning and innovation and proactive problem-solving. Teachers who want to achieve success with advanced EFL students need to unite their teaching experience with their technology abilities and their capacity to work with colleagues. Teachers who shared teaching methods and offered technology support to their colleagues experienced lower levels of anxiety while their teaching abilities strengthened (Cancino et al., 2022; Nazari et al., 2023). Educators need institutions to create support systems and professional development programs and peer mentoring initiatives which help them build resilience against quick technological changes (Lee, 2020; Toraman et al., 2022).

In addition, findings show technology-induced stress produces different effects between male and female populations. In fact, female teachers experience higher levels of fatigue, anxiety, and inefficacy (Akbana et al., 2022; Afsharpour et al., 2023). The research findings confirm previous studies which showed women encounter more difficulties in managing their work-life duties thus making them more susceptible to technostress (Wang & Yao, 2023; Dwivedi et al., 2024). On the other hand, male teachers demonstrate higher career commitment because they experience lower work-related stress. Their technical abilities and problem-solving skills help manage stress effectively (Nejati et al., 2014; Mokh et al., 2021).

Findings regarding technostress complexity align with previous empirical studies which demonstrated that skepticism, fatigue, anxiety, and inefficacy produce distinct effects. The research by Wang and Li (2019) and Estrada-Muñoz et al. (2020) and Li and Wang (2021) demonstrate that teachers experience different effects from each component, indicating that emotional and cognitive factors create the most significant impact on their psychological states and work performance. Teachers developed excessive fatigue and anxiety because they used technology excessively and lost control. Also, their lack of confidence with new ICT tools resulted in inefficacy. The research shows that teachers who get institutional support and work with experienced colleagues and maintain collaborative relationships experience lower stress levels. This demonstrates that environmental and psychosocial elements determine how technostress affects people (Muslimin et al., 2023; Fathali et al., 2024).

Conclusion

The research investigates technostress psychological factors which affect EFL teachers who work in Iranian advanced learning spaces through a mixed-methods approach. The research shows that teachers experience multiple factors which affect their mental state and their classroom performance when they use technology in their work.

The research shows that teachers face average technostress levels which mainly cause them to feel tired and doubtful and experience anxiety but they maintain strong performance at work and high job satisfaction and career dedication. The research revealed two main differences which showed that female teachers along with teachers who are 36 or older and married people and

teachers who have worked for more than 11 years of experience severe technostress symptoms in various aspects.

Furthermore, a significant negative relationship was established between all components of technostress (skepticism, fatigue, anxiety, inefficacy) and teachers' work performance, though no such relationship was found with job satisfaction or career commitment. The research results received support from qualitative data which showed that teachers experienced technostress because of four main factors which included techno-overload and complexity and invasion and a sense of separation from students that damaged their teaching abilities despite their strong professional dedication. The research results produce major effects on the study. The research shows that technostress creates an actual obstacle which prevents teachers from achieving their best work results despite their dedication to their job and positive job satisfaction. Educational institutions need to advance past their current practice of offering technological tools because they should establish complete support infrastructure. The program includes specialized teacher training which focuses on helping teachers from various groups who experience anxiety and need help with their teaching skills especially those who are experienced and female. People can reduce their stress levels through two proven methods which include setting particular boundaries to defend their personal time from technology and building community-based systems which provide peer assistance.

Finally, this study contains particular limits which impact its obtained results. The research findings might not apply to all cases because the study used self-reported data and convenience sampling from one province. The research design uses a cross-sectional approach which prevents scientists from determining the exact cause-and-effect relationships between studied variables. Research needs to perform longitudinal studies which monitor teacher technostress development throughout their teaching years to identify factors which produce different stress levels between teacher groups. The research requires expansion to study educational settings throughout Iran while assessing particular institutional programs which offer mentorship and digital literacy education. The research establishes that technostress functions as an essential factor which impacts modern educational settings. Educational leaders who understand their ability to affect teacher mental health must create specific support systems which protect teacher mental wellness. The system maintains educational standards through its creation of enduring educational facilities which provide both effective and compassionate learning experiences during digital transformation. The research confirms that teacher support stands as the essential factor which drives education progress.

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Conflict of interests

The authors declare that they have no conflict of interest.

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