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The Role of Computer Self-Efficacy and E-Learning Readiness Mediated with Technostress in Teacher Professional Competence

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Abstract

With the increasing popularity of virtual education following the COVID-19 pandemic and the advancement of technology in education, new opportunities and challenges have entered the realm of education. So it is necessary to pay attention to the preparation of schools for this type of learning as well as the self-efficacy of teachers in using information and Communication technology (ICT) skills and the stress they experience in using technology in their jobs. The aim of the study was to investigate the role of Computer Self-Efficacy and E-Learning Readiness Mediated with Technostress in Teacher Professional Competence. This study was applied in terms of goal and fell under descriptive-correlational research in terms of data collection. The statistical population consisted of all teachers of Tehran's District 15 working at high school levels from 2021 to 2022 (675 people), as 194 people were selected through convenience sampling. In order to collect data from Technostress and Computer Self-Efficacy questionnaire (Dong et al., 2020); E-learning Readiness questionnaire (Keramati et al., 2011); and Teacher Professional Competence questionnaire (Motahhari-Nezhad & Jahangard, 2016) were used. After calculating the scales' reliability, data were analyzed by SPSS and LISREL Software. The results showed that: computer self-efficacy and e-learning readiness had a direct, positive and significant effect on teacher professional competence. computer self-efficacy and e-learning readiness had a positive and significant indirect effect on teacher professional competence through technostress. Also technostress had a direct, negative and significant effect on teacher professional competence.

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Introduction

Societies' expectations of schools are increasingly becoming complex, as public opinions maintain that educational systems strongly contribute to their national success; thus, educational systems are expected to educate competent, effective, and influential people for the future. Hence, all countries are seeking ways to improve the quality of their schools and achieve higher social and economic benefits (Rezaei, 2019). Meanwhile teachers are the main agents of education and constitute the spirit of each country's educational systems, which can help meet national excellent objectives through diligent endeavor (Abdollahi et al., 2014). Concerning the important role of teachers, scholars maintain that the quality of every educational system will eventually depend on the quality of its teachers (Syakira, 2024 ; Uy et al., 2024 & Atstsaury, 2024), as no country can go beyond its teachers to meet its goals (Sarkararani, 2009). Experience has shown that the efficacy of administering curricula depends on the teacher's professional skills (Zakirova, 2016).

Today, the most important indicator of teacher educational quality is their professional competence (Prasetyono et al., 2021). Teachers' professional competence encompasses a multitude of skills and abilities necessary for the effective and successful management of the pedagogical process (Sarva et al., 2023 & Nijveldt et al., 2005) and greatly contributes to the realization of educational and non-educational objectives; there is also a positive and significant correlation between teacher professional competence and their work productivity and efficacy, and between their efficacy in the learning-teaching process and student achievement (Dibaei-Saber, 2017; Hakim, 2015 & Kunter et al., 2013).

Prasetyono et al. (2021) classified the criteria of teacher professional competence as follows: "1) Understanding competence standards and basic qualifications in specialized domains; 2) Selecting and developing subjects; 3) Understanding the structure and concept of intellectual-scientific patterns that support specialized domains; 4) Mastery over ways to develop critical knowledge and studies related to specialized domains; 5) Creativity and innovation in applying scientific disciplines related to the specialized domains; 6) Able to develop curriculum and syllabus related to the field of expertise; 7) Able to take reflective actions to improve the quality of learning; 8)Able to communicate with the professional community itself and other professions verbally and written; 9) Able to utilize information and learning technology and 10) Communicate and develop themselves as a teacher."

As in the research of Prasetyono et al. (2021) seen and many other researches (Zakirova, 2016 & Abdollahi et al. 2014), one of the things that shows and affects the professional competence of the teacher is the skill of using modern information and educational technologies in teaching. As technology has advanced, new opportunities and challenges have entered the realm of education (Zanda Rubene et al., 2021; Sarva et al., 2023). Teachers must be prepared to learn and adapt to new technologies in order to effectively utilize digital tools and resources for lesson planning, ensuring a rich and challenging learning experience (Āboltiņa et al., 2024; Sarva et al., 2023). On the one hand, education in many countries has largely been based on web technology and e-learning processes (Hogo, 2010), with such advantages as cost reduction, the elimination of time and place constraints, and contribution to traditional education making this technology more popular (Chao & Chen, 2009). On the other hand, considering the Coronavirus pandemic, which was followed by educational center closure, school principals and university directors had no choice but to turn to virtual education, which is still expected to dominate parts of education even after the end of the pandemic; therefore, the future of teacher profession will be interrelated with online education technologies (Chou & Chou, 2021). One of the most important factors that can affect the successful results of electronic education is readiness thus schools and teachers should improve and promote their readiness to apply this system (Wang et al., 2009). When introducing E-learning in an educational institution, it is expected that the educational institution should be prepared with adequate technological facilities, environmental and other facilities also (Majid

& Lakshmi, 2024). Therefore, it is necessary to know the extent of the educational institution's ability to provide an educational environment that adopts an advanced strategy for the continuity of the education process (Goh et al., 2020; Goni et al., 2020).

The readiness of e-learning is represented by the readiness of the educational institution through the infrastructure, the regulatory environment, and the electronic readiness of students and instructors (McKenney, 2013). Readiness factors fall into three main groups: technical (hardware, software, content, Internet access, bandwidths, and school setting), organizational (experts, organizational laws, organizational culture, and management viability), and social (social perception of electronic education, government rules, and administrative instructions), which are positively related to teacher professional competence (Keramati et al., 2011). It is worth mentioning that despite the introduction of online education in recent decades, official educational centers and schools have failed to employ it as much as higher educational institutes due to lack of preparation (Chou & Chou, 2021), and this lack of readiness may engender stress for teachers because as the Person-Environment Fit Theory suggests stress is caused by the mismatch between working demands and individual competence and their self-perception of it. This stress, which is defined to be the user's inability to adapt to or healthily cope with new computer technologies, is technostress (Rohwer et al., 2022).

Technostress is also regarded as the dark side of technology (Delpechitre et al., 2018). Technostress is increasingly becoming important because it affects the outcomes of health and work, such as fatigue, satisfaction, and performance (Gaudioso et al., 2016; Tarafdar & Ragu-Nathan, 2010). Ignoring technical stress may harm users in different ways, such as reducing well-being and impairing cognitive abilities (Salo et al., 2022; Tarafdar & Ragu-Nathan, 2010). High computer self-efficacy is one of the factors that makes teacher easier to use ICT (Karsten et al., 2012). This is what appears to result in a new job identity for teachers and thus considerably reduces their technostress (Aktag, 2015 & Simsek, 2011).

Self-efficacy refers to an individual's judgment about their abilities to perform certain behaviors to achieve intended goals (Paraskeva et al., 2008). This concept also contributes to improving teacher performance and competence, thus enabling them to meet occupational challenges (Ostadrahimi et al., 2020). There are different types of self-efficacy, but for the reasons mentioned above, in this research, computer self-efficacy (A person's confidence or attitude about their abilities to use technology (Compeau & Higgins, 1995)) is more important than other types.

The study by Compeau et al. (1999) and the one by Aktag (2015) found a positive and significant relationship between computer self-efficacy and teacher performance. In 2015, Aktag concluded that there is a positive and significant correlation between computer self-efficacy and teacher performance, while there is a negative and significant correlation between computer self-efficacy and teacher anxiety. This study demonstrated that increasing the time of using computers increased the subjects' computer self-efficacy and decreased their anxiety. Chou and Chou (2021) also found that low technostress in teachers makes them perform better in virtual education, web-based education and use of technology in teaching-learning processes. Durndell & Haag (2002) and Simsek (2011) also investigated and confirmed a significantly reverse relationship between computer self-efficacy and technostress. Salo et al.,'s study (2022) also found a negative relationship between ICT skills and technostress. Thaanyane & Jita (2024) came to this conclusion in their research that professional competence is influenced by attitudes toward using ICT, inadequate training, and institutional infrastructure. Teacher education institutions should improve their training programmes to adequately meet the needs of pre-service teachers and develop policies regarding the integration of ICT in their curriculum.

It should also be noted that Bandura's Social-Cognitive Theory states that personal factors, environmental stimuli and individual behavior are related and influence each other (Ostadrahimi et al., 2020). In this research self-efficacy and technostress are regarded as two personal factors, while e-learning readiness and

teacher professional competence are thought of as environmental and behavioral factors, respectively. Therefore, according to this theory and according to the research that was mentioned, in this research, the role of computer self-efficacy and e-learning readiness with the mediation of technostress in the professional competence of teachers is investigated (Figure 1). So far, no study has investigated this issue.

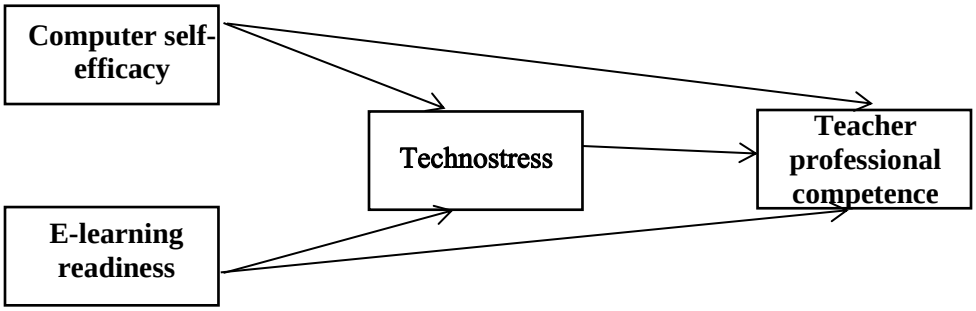

Figure 1: Conceptual model of the role of computer self-efficacy and e-learning readiness mediated with technostress in teacher professional competence

According to the conceptual model of the research, the following hypotheses were stated and tested

1. Teacher computer self-efficacy directly predicts their professional competence
2. E-learning readiness directly predicts teacher professional competence
3. Teacher computer self-efficacy, mediated with technostress, indirectly predicts their professional competence
4. E-learning readiness, mediated with technostress, indirectly predicts their professional competence.

Theoretical foundation

Teacher Professional Competence:

The teaching profession depends on skills and professional competencies, which can be summarized by the term professional competence (Ballová et al. 2024). Teacher professional competence is the ability, skill, and behavior that must be owned, internalized and mastered by a teacher in accordance with his teaching implementation as a teacher who requires expertise and skills that meet certain quality standards (Hariri et al. 2024). Different views on the definition and classification of professional competencies appear in the literature. Maleki (2009) divides the teacher's professional competence into three categories: 1) Cognitive competence: Knowledge and mental skills that enable the teacher to recognize and analyze issues; 2) Emotional competence: Teacher's tendencies and interests in issues related to education; 3) Skill competence: Practical skills and abilities of the teacher in the learning process (Dibaei-Saber, 2017). With advances in information and communication technology (ICT), teachers must be familiar with various digital learning media that are currently popular so they can utilize and optimize them (Tamara et al., 2024). teachers' understanding about ICT; teacher's frequency on the use ICT; teacher's readiness in using ICT; and the use ICT can support teacher's professional competence (Abkarin, 2021).

Computer Self-Efficacy

Computer self-efficacy is part of the general construct of self-efficacy (Bandura, 1977) and is defined as the degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer (Selinger& Gröstenberger, 2024). The conceptualization of self-efficacy was originally proposed by Bandura in his Social Cognitive Theory (Yokoyama, 2019). In this theory individuals are understood to be active agents in control of their own choices and behaviour. To understand how an individual's self-efficacy beliefs emerge, Bandura

identified four different sources: (1) mastery experiences; (2) vicarious experiences; (3) verbal persuasion; and (4) physiological and affective states. 'Mastery experiences' correspond to a person's recollection of and reflection on their own past accomplishments in similar tasks, while 'vicarious experiences' are gained from seeing or hearing about the accomplishments of others. Verbal persuasion' relates to the appraisals or feedback provided by others, while 'physiological and affective states' concern a person's interpretation of information derived through their own senses (Waddington, 2023). It should be noted that the same four sources of self-efficacy mentioned in Bandura's theory are also effective in computer self-efficacy and the largest contribution is related to mastery experiences and vicarious experiences (Smith, 2001).

E-Learning Readiness

During 2000's, the concept of readiness grew to form a framework for assessing the level of digital use between developing and developed countries (Mutula & Van, 2006). In that e-readiness is a relatively modern concept that has been expanded due to the rapid spread of Information Technology (IT) and the great progress in the business and industry sector (Al-Rikabi & Montazer, 2024). The readiness of e learning is represented by the readiness of the educational institution through the infrastructure, the regulatory environment, and the electronic readiness of students and instructors (McKenney, 2013). Several models have been proposed to assess the readiness of e-learning in various institutions readiness, The model proposed by Al-Rikabi & Montazer (2024) consists of 3 main dimensions and 13 factors It is distributed as follows: a. infrastructure dimension: Three factors, technological, communication network and security are included under this dimension; b. human dimension: Four factors include human resources, culture, psychological and educational ethics for the human dimension that represent learners, instructors and technicians as the main users of the e learning system and those responsible for the success of the application in the organization; c. organization dimension: Six factors include management, content, support, policy, financial, and evaluation included within the organization dimension as the main processes of the organization.

Technostress

This term was first developed by Craig Brad in 1984 (Rohwer et al. 2022). It is commonly understood as "a modern disease of adaptation caused by inability to cope with new computer technologies in a healthy manner" (Nastjuk et al., 2024). five conditions create technostress, referred to as "technostress creators": techno complexity, techno invasion, technoinsecurity, techno-overload, and techno uncertainty (Ragu-Nathan et al., 2008). The transactional model of stress (TMS) by Lazarus and Folkman (1984) is a widely adopted theoretical framework for studying technostress in the organisational and private usage contexts (Maier et al., 2022). In the TMS, stress results from a transaction between an individual and the environment, in which the environmental demands exceed the individual's capacity to respond to it (Nastjuk et al., 2024).

Method

The present study has an applied goal and fell under descriptive-correlational research in terms of data collection. As many as 675 teachers at high schools in Tehran's District 15 from 2021 to 2022 comprised the statistical population. According to hypothesized paths, ten parameters should be estimated, with the sample volume equaling at least 5 to 50 times the intended parameters (Mueller, 1999). Thus, a sample of 194 people was selected via convenience sampling.

Study scales were as follows:

A) E-learning Readiness Questionnaire: The Keramati et al. questionnaire (2011) with 11 items on a five-option Likert scale of very bad (1) to very good (5) was used. The validity of this scale was estimated to be 0.82 via Cronbach's alpha, while the reliability was found to be good.

B) Teacher Computer Self-Efficacy Questionnaire: The Dong et al. questionnaire (2020) with 5 items on a

C) five-option Likert scale of completely disagree (1) to completely agree (5) was used. Its

reliability was 0.78 via Cronbach's alpha, which was good.

D) Technostress Questionnaire: The Dong et al. questionnaire (2020) is an adjusted form of Lloyd and Lloyd's Computer Attitude Scale (1985). The main tools include trust in computers, interest in computers, and computer anxiety. Yang Dun et al. opted to measure teacher technical stress. Eight items, ranging from very low (1) to very high (5), measured teacher technostress, and the reliability of the scale was confirmed to be 0.86 using Cronbach's alpha.

E) Teacher Professional Competency Questionnaire: The Motahhari Nezhad and Jahangard questionnaire (2016) with 28 items of very low (1) to very high (5) measures teacher professional competence on three subscales of education planning, ethics and professional responsibility, and resource management. Also, other researcher-made questionnaires estimated the reliability of the main scale and other subscales to be 0.89, 0.78, 0.75, and 0.79, respectively, suggesting good validity.

Findings

To determine the mean of the variables of e-learning readiness, computer self-efficacy, technostress, and professional competence, descriptive statistical indices, including average, standard deviation, and correlation matrix between study variables were used (Table 1).

Table 1: Mena, SD, and correlation coefficients between study variables

Variables	Mean	SD	(1)	(2)	(3)	(4)
Teacher professional competence	3.925	0.653	-			
Technostress	1.954	0.732	-0.422**	-		
Computer self-efficacy	3.841	0.637	0.395**	-0.550**	-	
E-learning readiness	3.113	0.696	0.529**	-0.272**	0.297**	-

According to Table 1, the mean teacher professional competence is 3.925 and is higher than the medium level; this is also true of teacher computer self-efficacy and e-learning readiness with means of 3.841 and 3.113, respectively. The mean technostress is 1.954 and is much lower than the medium level, suggesting that the studied teachers were experiencing medium computer self-efficacy and low technostress, while e-learning readiness is reported to be within a medium range. There is a positive and significant correlation between the two variables of computer self-efficacy and e-learning readiness with teacher professional competence, with e-learning readiness being more correlated than computer self-efficacy with teacher professional competence. Also, there is a negative correlation between these two variables with technostress at -0.550 and -0.272, respectively. This indicates that if teachers enjoy good computer self-efficacy and have readiness for e-learning, their technostress will be lower, thus having their professional competence increase because of the negative and significant correlation between technostress and professional competence.

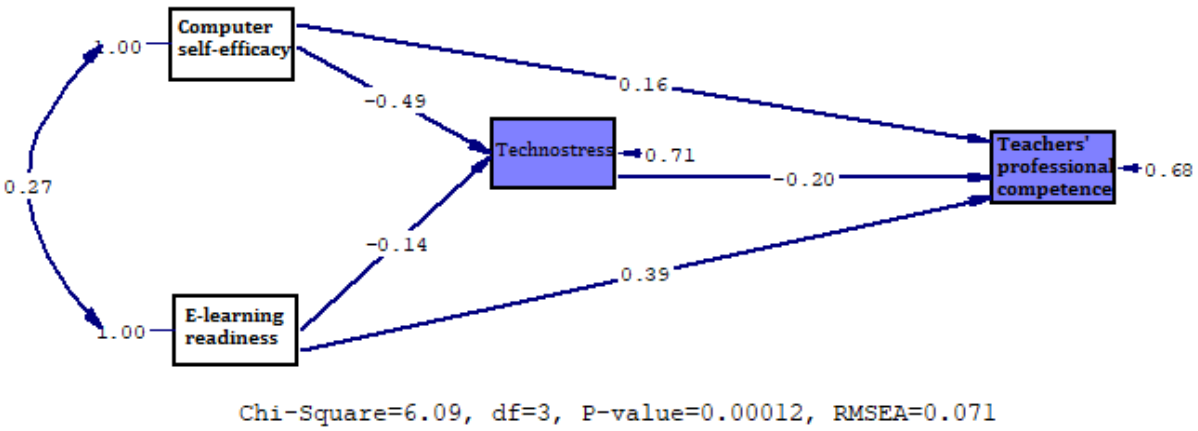

Figure 2: Final model of the effects of computer self-efficacy and e-learning readiness mediated with technostress on teacher professional competence.

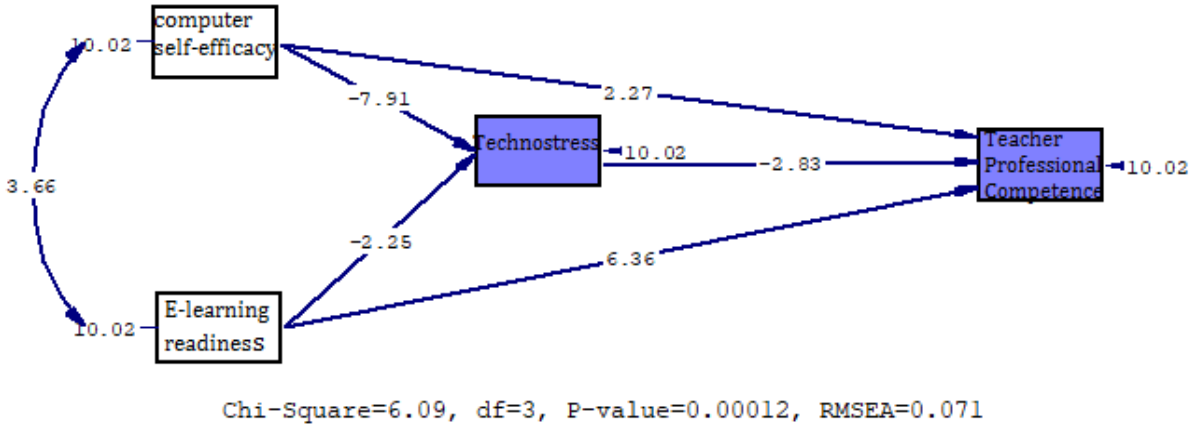

Figure 3: Final model of the effects of computer self-efficacy and e-learning readiness mediated with technostress on teacher professional competence (T statistics)

In the final model, as illustrated by Figures 2 and 3, computer self-efficacy with the regression coefficient of $(\gamma_{11} = \mathbf{0.16}\ , t = \mathbf{2.27}\ , p \le .05)$ and e-learning readiness with the regression coefficient of $(\gamma_{21} = \mathbf{0.39}\ , t = \mathbf{6.36}\ , p \le .05)$ had positive and significant effects on teacher professional competence. Also, computer self-efficacy with the regression coefficient of $(\gamma_{12} = -.49, t = -7.91, p \le .05)$ and e-learning readiness with the regression coefficient of $(\gamma_{22} = -.14, t = -2.25, p \le .05)$ had significant effects on technostress, while technostress with the regression coefficient of $(\gamma_{31} = -.02, t = -2/83, p \le .05)$ had a significant and negative effect on teacher professional competence. According to the above results, teacher

computer self-efficacy, mediated with technostress, had an indirect effect of 0.10 and a significance coefficient of 2.65 on teacher professional competence, while e-learning readiness, mediated with technostress, had an indirect effect of 0.028 and a significance coefficient of 2.03 on teacher professional competence.

Table 2: Model fit indices

Index	Acceptable range	Values	Outcomes
X2	0.05≥ P	6.09	Supported
Df	-	3	-
X2/DF	5 -3	2.03	Supported
RMSEA	0.08 ≤ RMSEA	0.071	Supported
GFI	0.90 ≥ GFI	1	Supported
AGFI	0.90 ≥ AGFI	0.98	Supported
NFI	0.90 ≥NFI	0.99	Supported
CFI	0.90≥ CFI	0.99	Supported
IFI	0.90≥ IFI	1	Supported

Table 3: Direct and indirect effects of computer self-efficacy, e-learning readiness, and technostress on teacher professional competence

Note*: *P* < 0.01**; *P* < 0.05

Effect	Path	Direct effects	Indirect effects	Total effects
Exogenous to the endogenous	Computer self-efficacy on teachers' professional competence	*0.16	*0.10	**0.26
	E-learning readiness on teachers' professional competence	**0.39	*0.028	**0.418
	Computer self-efficacy on technostress	**-0.49	-	**-0.49
	E-learning readiness on technostress	*-0.14	-	*-0.14
Endogenous to the exogenous	Technostress on teachers' professional competence	**-0.20	-	**-0.20

Note: *P* < 0.01**; *P* < 0.05

Discussion and Conclusion

This study developed a hypothetical model of structural relations between computer self-efficacy and e-learning readiness with teacher professional competence, which highlighted the mediating role of technostress in this connection.

The first finding of the study suggested that the mean teacher professional competence in the studied population was 3.925 and was higher than the medium level. This finding was in line with that of Dibaei-Saber (2017) and Abdollahi et al (2014). This finding indicates that teachers evaluated their competence above the medium level in various domains such as relating curricular objectives with learning expectations, awareness of students' needs, attention to their differences, establishing effective communications with them, motivating the sense of curiosity and motive in students, and using colleagues' experiences. Since

teachers are the most influential agents in the educational systems of any country, their competence is critical for every educational system and can guarantee the realization of expected educational goals. Various studies have demonstrated positive and significant relationships between teachers' professional competence and their efficacy in the learning-teaching process (Dibaei-Saber, 2017), Education Quality (Hariri et al., 2024), performance (Dewi & Singh, 2022), and working productivity (Asmarani et al., 2021). These findings indicate the importance of teacher's professional competence. Also, with the advancement of technology, new opportunities and challenges have entered the field of education (Ruben et al., 2021; Saro et al., 2023) and teachers must be ready to learn and adapt to new technologies, Therefore, whether we like it or not, the teacher's professional competence is also intertwined with technology. So, in this research, the researcher investigated the role of computer self-efficacy, e-learning readiness and technical stress on teachers' professional competence.

The second finding:The mean teacher computer self-efficacy was reported to be above the medium level, which is in line with Pourasghar and Zare's study (2015). This mean level reflects an individual's trust in and attitude to their abilities to use technologies. This finding also indicates that teachers evaluated their technical skills to effectively use ICT and catch up with it above the medium level. According to a model presented by Zaki's study (2010), working with computer and familiarity with it contributed to the formation of self-efficacy. Also, the more computer experience, the more computer self-efficacy (Gallagher, 2007; Kachelhoffer & Khine, 2009).

The direct relationship between the two variables of computer self-efficacy and e-learning readiness with teacher professional competence was another finding of the study. In his study, Zakirova (2016) identified the factors affecting teacher professional competence and referred to the skills of using modern ICT and educational technologies and the ability to design curricula using modern educational ICT. In the meantime, it is well established that proportionate e-learning readiness and high computer self-efficacy can increase teacher skills. In Abdollahi et al.'s study (2014), teacher competence is characterized by the knowledge of the latest educational developments and its application in improving modern educational strategies, and methods and a positive attitude to new issues and innovation at work. Also Thaanyane & Jita (2024) came to this conclusion in their research that professional competence is influenced by attitudes toward using ICT, inadequate training, and institutional infrastructure. Therefore, the more teachers gain experience in working with technologies and see themselves as self-effective, and the more necessary platforms will be available for e-learning, which is undoubtedly an integral part of the teachers' profession, the more teachers will gain competence and performance. As stated by Prasetyono et al. (2021), teacher skills in using modern educational technology and methods will serve as an influential factor in their professional competence.

Another finding demonstrated the negative and significant relationship between computer self-efficacy and technostress, suggesting that the more a teacher has computer self-efficacy and see themselves capable of working with ICT skills, the less technostress they will suffer. This finding is in line with those of Aktag (2015), Durndel and Haag (2002), and Simsek (2011). In this connection, studies by Pourasghar and Zare (2015) and Khaleghkhah and Babaei-Menghari (2016) reported a negative and significant correlation between computer self-efficacy and computer anxiety; it is worth mentioning that technostress, like any other stress, originates from one's prior experiences (Tarafdar et al. 2019). An individual's (un) successful performance in prior experiences directly determines their stress in a new situation. On the other hand, it is known that one of the most effective sources underlying efficacy is the individual's past experiences (Bandura, 1997). The successful experience of similar situations of the current situation determines the individual's self-efficacy and the perception they have of their abilities. Thus, the relationship between these two variables will be explained accordingly. When an individual enjoys prior good experiences, they will feel empowered in doing related work and thus have higher self-efficacy

and lower stress. Also, consistent with the Person-Environment Fit Theory, stress is caused by a mismatch between working demands and an individual's competence (Qi, 2019), denoting that if the individual does not see necessary competence in work (lack of self-efficacy) and fails to adapt to the new demands of the working environment (online and virtual education and using ICT in teaching profession), they will experience stress. Thus, this theory confirms the relationship between these two variables. Herman et al. (2020) presented the C3 theory and identified three factors affecting teachers' working stress. These three factors were confrontation, competence in administering ways that would effectively manage the learning and teaching process, and a setting in which education is practiced, including policies, manners, and administrative support. Teacher self-efficacy can be related to the second factor of this theory (teacher competence) because competence and self-efficacy are interrelated. The more the teacher gains competence, the more they are empowered to do their tasks and this denotes that they will have higher self-efficacy. Thus, the relationship between the two variables will be explained.

Also, there is a negative and significant relationship between e-learning readiness and technostress. According to Karr-Wisniewski and Lu (2010) and Çoklar et al. (2017), the lack of professional development and practice, limited education and resources, inadequate knowledge of technology, low-quality equipment, low human interaction, and general suspicions may engender technical stress in employees, thus causing low e-learning readiness. If this readiness is acceptable, it means necessary education is provided there is high-quality equipment, and people are well familiar with technology; thus, there is no reason to have stress. Also, according to Bandura's Social Cognitive Theory, personal factors (e.g., beliefs, expectations, attitudes, knowledge, etc.), environmental events (physical and social), and personal behaviors (e.g., verbal and practical behaviors) affect each other and of these three can be thought of determining human behavior (Saif, 2017). Here, e-learning readiness, which includes three technical, organizational, and social factors, is regarded as the environmental factor; this denotes that there are facilities, equipment, hardware, and software required for electronic education; the Internet speed, learning content and environment, and government rules and laws are proportionate and there are transparent administrative guidelines in this connection. Meanwhile, technostress is regarded as a personal factor. Thus, the relationship between these two variables is explained; also, there is a negative and significant relationship between technostress and teacher professional competence. This finding is in line with Aktag's study (2015) stating the negative and significant relationship between computer stress and teacher performance. Teacher professional competence is also regarded as a behavior. According to Bandura, personal (self-efficacy) and environmental factors (e-learning readiness) affect teacher professional competence. The presence of a negative relationship between technostress and teacher competence is also consistent with the finding by Chou and Chou (2021), who stated that the less teacher technostress, the more they are willing to continue virtual education and the more web-based education and the use of technology in the learning-teaching process. Because future teacher professions will be related to technology and online education (Ibid), their willingness and skills to use technology will greatly contribute to their professional competence; in addition, according to the C3 Theory, stated above, e-learning readiness can be considered the third factor of this theory. The third factor refers to administrative policies and support and their effects on causing stress in teachers. Thus, the relationship between e-learning readiness and teacher stress can be explained.

The two variables of computer self-efficacy and e-learning readiness directly affect teacher professional competence, while indirectly affecting it with the mediation of technostress. As stated above, computer self-efficacy and e-learning readiness are both negatively and significantly related to technostress, suggesting that the greater the level of these two variables, the less technostress facing teachers. On the other hand, a negative and significant relationship between technostress and teacher professional

competence was examined and confirmed. This indicated that the less teacher technostress, the more their professional competence. Thus, strengthening computer self-efficacy and e-learning readiness both reduce technostress, which finally increases teachers' professional competence.

For Japanese scientists, the competence of every educational system is as much as that of its teachers, as teacher skills and competence affect their efficacy and help realize school goals and student academic achievement (Abdollahi et al., 2014). Competence is defined to be what directly and indirectly affects teacher occupational performance; thus, a teacher who has the necessary competence and proficiency will have a greater level of skills, knowledge, and attitude (Dibaei-Saber, 2017). This study aimed to study the role of three factors of computer self-efficacy, e-learning readiness, and technostress on teacher professional competence, based on the current educational and future conditions. Concerning the effects of these factors on teacher competence, it is increasingly essential to pay attention to preparing electronic learning infrastructure and train teachers to increase their skills to use ICT and to reduce their technostress.

Considering the roles of computer self-efficacy and e-learning readiness in teacher professional competence, in-service courses, applied training, and ICT courses are suggested to be held to increase teacher empowerment. All three technical, organizational, and social factors, that promote e-learning, need to be prioritized by schools, the government, and general educational offices. The government, meantime, is suggested to allocate an adequate budget for electronic education. Also, it is proposed to provide cultural readiness to change learning methods and curricular content to adjust to e-education. In sum, future research is suggested to take up the subjects of teacher performance as the core element of education and their professional competence.

References

Abdollahi, B., Dadjooye Tavakkoli, A., & Ali Youseliani, G. (2014). Identification and validation of effective teachers' professional competence. *Educational Innovations*, 13(1), 25-48.

Abkarin, N. A. (2021). The analysis of teachers' professional competence in utilizing information and communication technology. In ELT Forum: *Journal of English Language Teaching*, 10(2), 125-135.

Aboltiņa, L., Lāma, G., Sarva, E., Kaļķe, B., Aboliņa, A., Daniela, L., ... & Bernande, M. (2024). Challenges and opportunities for the development of future teachers' professional competence in Latvia. *In Frontiers in Education*, 8, 1-9.

Aktag, I. (2015). Computer self-efficacy, computer anxiety, performance and personal outcomes of Turkish physical education teachers. *Educational Research and Reviews*, 10(3), 328-337.

Al-Rikabi, Y. K., & Montazer, G. A. (2024). Designing an e-learning readiness assessment model for Iraqi universities employing Fuzzy Delphi Method. *Education and Information Technologies*, 29(2), 2217-2257.

Asmarani, A., Sukarno, S., & El Widdah, M. (2021). The Relationship of Professional Competence with Teacher Work Productivity in Madrasah Aliyah. Nidhomul Haq: *Journal Manajemen Pendidikan Islam*, 6(2), 220-235.

Atstsaury, S., Hadiyanto, H., & Supian, S. (2024). Principal's Strategy to Improve Teachers Professional Competence. *Munaddhomah: Journal Manajemen Pendidikan Islam*, 5(1), 1-10.

Ballova Mikuškova, E., Veresova, M., & Gatial, V. (2024). Antecedents of teachers' professional competencies. *Cogent Education*, 11(1), 2286813.

Bandura, A. (1997). Self-Efficacy in v. s. Ramachaudran (Ed), *Encyclopedia of human behavior*, 4, 71-81.

Chao, R. J., & Chen, Y. H. (2009). Evaluation of the criteria and effectiveness of distance e-learning with consistent fuzzy preference relations. *Expert Systems with Applications*, *36*(7), 10657-10662.

Chou, H. L., & Chou, C. (2021). A multigroup analysis of factors underlying teachers' technostress and their continuance intention toward online teaching. *Computers & Education*, *175*, 104335.

Çoklar, A. N., Efilti, E., & Sahin, L. (2017). Defining Teachers' Technostress Levels: A Scale Development. *Online Submission*, 8(21), 28-41.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 19(2), 189-211.

Compeau, D., Higgins, C. A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly*, 32(2), 145-158.

Delpechitre, D., Black, H. G., & Farrish, J. (2018). The dark side of technology: examining the impact of technology overload on salespeople. *Journal of Business & Industrial Marketing*, 34(1), 1-18.

Dewi, R., & Singh, P. (2022). The Effect of Academic Supervision and Teacher Professional Competence on Teacher Performance. *PPSDP International Journal of Education, 1*(1), 122-131.

Dibaei-Saber, M. (2017). Analysis of the relationship between the development of professional competence of middle school teachers and their effectiveness in the teaching-learning process of students. *New Strategies For Teacher Education*, 4(6), 1-23.

Dong, Y., Xu, C., Chai, C. S., & Zhai, X. (2020). Exploring the structural relationship among teachers' technostress, technological pedagogical content knowledge (TPACK), computer self-efficacy, and school support. *The Asia-Pacific Education Researcher*, 29(2), 147-157.

Durndell, A., & Haag, Z. (2002). Computer self-efficacy, computer anxiety, attitudes towards the Internet, and reported experience with the Internet, by gender, in an East European sample. *Computers in human behavior*, 18(5), 521-535.

Gallagher, D. K. (2007). *Learning styles, self-efficacy, and satisfaction with online learning: Is online learning for everyone?* (Doctoral dissertation, Bowling Green State University).

Gaudioso, F., Turel, O., & Galimberti, C. (2016). Explaining work exhaustion from a coping theory perspective: Roles of techno-stressors and technology-specific coping strategies. *Annual Review of Cybertherapy and Telemedicine*, 2019, 14-20.

Goh, P. S. C., Loy, C. L., Wahab, N. A., & Raja Harun, R. N. S. (2020). Preschool teachers' use of English as a medium of instruction: A systematic review of barriers and strategies. *Issues in Educational Research*, 30(3), 943–964.

Goni, J., Cortazar, C., Alvares, D., Donoso, U., & Miranda, C. (2020). Is teamwork different online versus face-to-face? A Case in Engineering Education. *Sustainability*, 12(24), 1-8.

Hakim, A. (2015). Contribution of competence teacher (pedagogical, personality, professional competence, and social) on the performance of learning. *The International Journal of Engineering and Science*, *4*(2), 1-12.

Hariri, H., Thobi, M., Sowiyah, S., & Riswandi, R. (2024). The Effect of Teacher Professional Competence on Education Quality: A Literature Review. Edumaspul: *Journal Pendidikan*, 8(1), 154-158.

Herman, K. C., Reinke, W. M., & Eddy, C. L. (2020). Advances in understanding and intervening in teacher stress and coping: The Coping-Competence-Context Theory. *Journal of School Psychology*, 78, 69-74.

Hogo, M. A. (2010). Evaluation of e-learning systems based on fuzzy clustering models and statistical tools. *Expert systems with applications*, 37(10), 6891-6903.

Kachelhoffer, A., & Khine, M. S. (2009, July). Bridging the digital divide, aiming to become lifelong learners. In *IFIP World Conference on Computers in Education*, 229-237.

Karr-Wisniewski, P., & Lu, Y. (2010). When more is too much: Operationalizing technology overload and exploring its impact on knowledge worker productivity. *Computers in Human Behavior*, *26*(5), 1061-1072.

Karsten, R., Mitra, A., & Schmidt, D. (2012). Computer self-efficacy: A meta-analysis. *Journal of Organizational and End User Computing (JOEUC)*, *24*(4), 54-80.

Keramati, A., Afshari-Mofrad, M., & Kamrani, A. (2011). The role of readiness factors in E-learning outcomes: An empirical study. *Computers & Education*, *57*(3), 1919-1929.

Khaleghkhah, A., & Babaei Menghari, M. (2016). Relationship between Identity Properties and Computer Anxiety with Computer Self-efficacy of High Schools Students. *Educational Psychology*, 12(39), 157-173.

Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: effects on instructional quality and student development. *Journal of Educational Psychology*, *105*(3), 805.

Majid, I., & Lakshmi, Y. V. (2024). Models of E-learning Readiness in Higher Education: A Systematic Review. *Indian Journal of Educational Technology*, 6(1), 54.

McKenney, S. (2013). Designing and researching technology-enhanced learning for the zone of proximal implementation. *Research in learning technology*, 21, 1-6.

Motahhari-Nezhad, H., & Jahangard, H. (2016). Constructing and Validating the Teachersa Professional Competence Evaluation Instrument. *Teaching and Learning Research*, 15(1), 43-53.

Mueller, R. O. (1999). *Basic principles of structural equation modeling: An introduction to LISREL and EQS*. Springer Science & Business Media.

Mutula, S. M., & Van Brakel, P. (2006). An evaluation of e-readiness assessment tools with respect to information access: Towards an integrated information rich tool. *International Journal of Information Management*, 26(3), 212-223.

Nastjuk, I., Trang, S., Grummeck-Braamt, J. V., Adam, M. T., & Tarafdar, M. (2024). Integrating and synthesising technostress research: a meta-analysis on technostress creators, outcomes, and IS usage contexts. *European Journal of Information Systems*, 33(3), 361-382.

Nijveldt, M., Mieke, B., Douwe, B., Nico, V., & Theo, W. (2005). Assessing the interpersonal competence of beginning teachers: The quality of the judgment process. *International Journal of Educational Research*, 43, 89-102.

Ostadrahimi, M., Araste, H., & Abdollahi, B. (2020). Investigating the relationship between mentoring and self-efficacy of novice teachers. *Educational Innovations*, 19(4), 113-136.

Paraskeva, F., Bouta, H., & Papagianni, A. (2008). Individual characteristics and computer self-efficacy in secondary education teachers to integrate technology in educational practice. *Computers & Education*, *50*(3), 1084-1091.

pourasghar, N., Zare, H. (2015). Previous Experience of University Students and Tasks Performance Connected to Computer: Role of Computer Self-Efficacy, Computer Anxiety and Gender. *Research in School and Virtual Learning*, 3(9), 69-82.

Prasetyono, H., Abdillah, A., Djuhartono, T., Ramdayana, I. P., & Desnaranti, L. (2021). Improvement of Teacher's Professional Competency in Strengthening Learning Methods to Maximize Curriculum Implementation. *International Journal of Evaluation and Research in Education*, *10*(2), 720-727.

Qi, C. (2019). A double-edged sword? Exploring the impact of students' academic usage of mobile devices on technostress and academic performance. *Behavior & Information Technology*, *38*(12), 1337-1354.

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information systems research*, 19(4), 417-433.

Rezaei, M. (2019). Teachers' professional competencies: past, present, future. *Quarterly Journal of Education*, 35(2), 129-150.

Rohwer, E., Flöther, J. C., Harth, V., & Mache, S. (2022). Overcoming the "Dark Side" of Technology—A Scoping Review on Preventing and Coping with Work-Related Technostress. *International journal of environmental research and public health*, *19*(6), 3625.

Saif, Ali Akbar. (2017). *Modern educational psychology: the psychology of learning and education*. Tehran: Duran. The seventh edition.

Salo, M., Pirkkalainen, H., Chua, C. E. H., & Koskelainen, T. (2022). Formation and Mitigation of Technostress in the Personal Use of IT. *Mis Quarterly*, *46*(2), 1073-1108.

Sarkararani, Mohammad Reza. (2009). *Educational reforms and modernization with an emphasis on the comparative study of education in Iran and Japan*. Tehran: Roznagar

Sarva, E., Purina-Bieza, K.E., and Daniela, L. (2023). Self-evaluation instrument for measuring teachers' pedagogical digital competence. *INTED2022 Proceedings*. 3568–3576.

Selinger, A., & Gröstenberger, E. (2024). The effect of gender and age on computer self-efficacy, computer anxiety and perceived enjoyment among Austrian secondary school teachers. *MAP Education and Humanities*, 4, 1-9.

Simsek, A. (2011). The relationship between computer anxiety and computer self-efficacy. *Contemporary educational technology*, *2*(3), 177-187.

Smith, S. M. (2001). The four sources of influence on computer self-efficacy. *Delta Pi Epsilon Journal*, *43*(1), 27-39.

Syakira, R. (2024, May). The Role of Teachers and the Unmaximum Quality of Teachers in Education in Indonesi. *International Conference on Learning Community*, 1(1), 1-11.

Tamara, Y., Hermansyah, H., & Marleni, M. (2024). Analysis of Teacher Professional Competence in Utilizing Information and Communication Technology. Esteem *Journal of English Education Study Programme*, 7(1), 193-206.

Tarafdar, M., Cooper, C. L., & Stich, J. F. (2019). The technostress trifecta-techno eustress, techno distress, and design: Theoretical directions and an agenda for research. *Information Systems Journal*, 29(1), 6-42.

Tarafdar, M., Tu, Q., & Ragu-Nathan, T. S. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems*, 27(3), 303-334.

Thaanyane, M., & Jita, T. (2024). Pre-Service Teachers' Professional Competence in Integrating ICT in Business Education in Lesotho: A Systematic Literature Review. *International Journal of Learning, Teaching and Educational Research*, 23(4), 462-475.

Uy, F., Kilag, O. K., Calledo, M. F., Cerna, Y. D., Angtud, N. A., & Villanueva, K. (2024). Quality Performance of Teachers: Work Environment, Work Attitude, and Principal Supervision: Qualitative Investigation. *International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence (IMJRISE)*, 1(1), 101-109.

Waddington, J. (2023). Self-efficacy. *ELT Journal*, 77(2), 237-240.

Wang, Q., Zhu, Z., Chen, L., & Yan, H. (2009). E-learning in China. *Campus-Wide. Information Systems*, 26,47–61.

Zaki, M. (2010). Measuring Computer Self-efficacy; Application of Computer Self-Efficacy in the field of IT users, A Case Study of University Student in Isfahan and Shahreza. *Global Media Journal-Persian Edition*, 5(2), 1-8.

Zakirova, R. A. (2016). The Structure of Primary School Teachers' Professional Competence. *International Journal of Environmental and Science Education*, 11(6), 1167-1173.

Zanda Rubene, L. D., Sarva, E., & Rūdolfa, A. (2021). Digital transformation of education: Envisioning post-covid education in Latvia. *Human, technologies and quality of education*, 180, 179-196.

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