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Araştırma Makalesi ● Research Article

Reviewing The Structural Relationship Among the Technology Leadership, Technostress and Technology Acceptance of School Administrators

Okul Yöneticilerinin Teknoloji Liderliği, Teknostres ve Teknoloji Kabulü Arasındaki Yapısal İlişkinin İncelenmesi

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Abstract: The aim of this study is to review the influence of technology leadership on school administrators' technostress and technology acceptance. Technology is seen as an indispensable part of educational organizations that are constantly changing and transforming to meet the needs of 21st century society and technology leadership, which has emerged as a result of rapidly developing technology. Although prior studies have examined these dimensions separately, there has been no study that investigates them all. This research is designed as a correlational survey model as it aims to reveal the relationships between technology leadership, technostress and technology acceptance. The participants of the study were school administrators of K-12 schools in Izmir, Turkey. A total of 499 school administrators, 112 of whom were participated in the pilot study and 387 in the main study. In order to conduct this research, ethical permission was obtained from the Social and Human Sciences Research Ethics Committee of Istanbul University – Cerrahpasa with the date 15.04.2021 and number E-74555795-050.01.04-77271. The Technology Leadership Competency Scale for School Administrators, The Unified Theory of Acceptance and Use of Technology (UTAUT) 2 Scale and The Teachers' Technostress Levels Defining Scale (TTLDS) were used in this study. The data was collected through an online survey. Permission was obtained from the İzmir Provincial Directorate of National Education-Turkey. The SPSS 18.0 statistics program was used to analyze the data. According to the study's findings, administrators' technology leadership predicts their technostress and technology acceptance. In addition, administrators' technology acceptance predicts their technostress. Technology leadership and technology acceptance have statistically significant negative effects on technostress. Technology leadership has a statistically significant positive effect on technology acceptance.

Keywords: School Administrators, Technology Acceptance, Technology Leadership, Technostress

Öz: Bu çalışmanın amacı, teknoloji liderliğinin okul yöneticilerinin teknostres ve teknoloji kabulü üzerindeki etkisini araştırmaktır. Teknoloji, 21. yüzyıl toplumunun ihtiyaçlarını karşılamak için sürekli değişen ve dönüşen eğitim örgütlerinin ve hızla gelişen teknolojinin bir sonucu olarak ortaya çıkan teknoloji liderliğinin vazgeçilmez bir parçası olarak görülmektedir. Literatürde yapılan önceki çalışmalar incelendiğinde bu boyutların ayrı ayrı ele alındığı ancak üç boyutu bir arada inceleyen bir çalışma olmadığı görülmüştür. Bu çalışma teknoloji liderliği,

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teknostres ve teknoloji kabulü arasındaki ilişkiyi ortaya koymayı amaçladığı için ilişkisel tarama modeli kullanılmıştır. Araştırmaya pilot uygulamaya 112, asıl çalışmaya 387 olmak üzere toplam 499 okul yöneticisi katılmıştır. Bu araştırmanın yapılabilmesi için İstanbul Üniversitesi - Cerrahpaşa Sosyal ve Beşeri Bilimler Araştırmaları Etik Kurulu'ndan 15.04.2021 tarih ve E-74555795-050.01.04-77271 sayılı izin alınmıştır. Araştırmanın katılımcıları İzmir'de bulunan A-12 okullarının okul yöneticileridir. Bu çalışmada Eğitim Yöneticileri Teknoloji Liderliği Ölçeği, Teknoloji Kabul ve Kullanım Birleştirilmiş Modeli (UTAUT) 2 Ölçeği ve Öğretmenlerin Teknostres Düzeylerini Belirleme Ölçeği (TTLDS) kullanılmıştır. Araştırmanın verileri çevrimiçi olarak toplanmıştır. Çalışma ile ilgili gerekli izinler İzmir İl Milli Eğitim Müdürlüğünden alınmıştır. Veriler, SPSS 18.0 istatistik programı ile analiz edilmiştir. Araştırmada toplanan verilerin analiz sonuçlarına göre, okul yöneticilerinin teknoloji liderliği, teknostres düzeyleri ve teknoloji kabul düzeylerini yordamaktadır. Ayrıca, okul yöneticilerinin teknoloji kabul düzeyleri, teknostres düzeylerini yordamaktadır. Çalışmada elde edilen sonuçlara göre teknoloji liderliği ve teknoloji kabul düzeylerinin teknostres üzerinde negatif etkiye sahip olduğu; teknoloji liderliğinin teknoloji kabul düzeyi üzerinde olumlu etkiye sahip olduğu görülmüştür.

Anahtar kelimeler: okul yöneticileri, teknoloji kabulü, teknoloji liderliği, teknostres

Introduction

Technology is seen as an indispensable part of educational organizations that are constantly changing and transforming to meet the needs of 21st century society and technology leadership, which has emerged as a result of rapidly developing technology. The effective use of technology in educational organizations means technology leadership is gaining importance daily. A school administrator's leadership has influence on the standard of education, the growth of a school and the learning of students. In addition, a school administrators' leadership may increase the teaching skills of teachers, improve the way of learning and have a positive effect on student learning. A school administrator as a leader, should incorporate school tools, improve the learning of students, and support the teachers' teaching process. At this point in a globalized world a school administrator's leadership styles gain importance. Gulpan and Baja (2020) point out that educational leadership has become more dynamic with the need for incorporating technology into the teaching-learning environment and emphasize that the position of the school administrators has changed. Accordingly, technological leadership is a growing phenomenon in the world of educational leadership as schools need leaders who are knowledgeable regarding the positives and negatives of school technology (Chang, 2012). As the expectation for schools to create learning societies that are useful and effective gains greater importance, it is becoming increasingly important for school administrators to understand their leadership positions in the technology (Afshari, Bakar, Luan, Samah, & Fooi, 2009; Eichhorn et al., 2018; Moreira, Rivero, & Alonso, 2019; Yieng & Daud, 2017). To be able to use computers for personal purposes, and encourage a school's culture of exploring new methods for teaching, learning and management, school administrators need to recognize the capabilities of digital technology (Arokiasamy, Abdullah, & Ismail, 2015). Leithwood, Sun and McCullough (2019) discuss the purposeful execution of leadership at all levels to support technology.

According to some studies most school administrators are unprepared to succeed in technology leadership role (Eichhorn, et al., 2018; Schrum, Galizio, & Ledesma, 2011). It is apparent that schools cannot succeed with administrators serving only in managerial and administrative role (Dinham, 2016; Machado, & Chung, 2015; Marzano, Waters, & McNulty, 2005; Moreira et al., 2019). Their changing role demands technology leadership (Hamzah, Juraime, Hamid, Nordin, & Attan, 2014; Machado & Chung, 2015; Zhong, 2017). There are some challenges that school technology leaders face: one of them is technostress and technology acceptance processes. The negative effects of technostress are discussed in some researches (Harper, 2000; Sabzian & Gilakjani, 2013; Sarabadani, Carter, & Compeau, 2018). There are some studies that have focused on technostress (Al-Fudail & Mellar 2008; Joo, Lim, & Kim, 2016) and technology acceptance. Although there are some studies that focused on technostress and its effects (Jena, 2015; Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008) there are few studies on how to effectively reduce the technostress of school administrators (Boyer-Davis, 2018). Identifying those essential variables will support administrators' professional development in order to minimize levels of technostress. Technology-related stress also affects administrators' feelings and intentions negatively toward accepting technology, especially studies on teachers have shown this (Joo et al., 2016; Suh & Lee, 2017).

As in the previous studies in the literature, the creators of technostress were classified as internal and external factors, in this study, based on person environment fit theory (Edwards, Caplan, & Harrison, 1998), technology acceptance and technology leadership were accepted as internal sources. Although Joo et al. (2016) and Dong, Xu, Chai and Zhai (2020) have conducted researches on this, technology leadership influence and technology acceptance on technostress levels of the administrators is unclear. There aren't any studies on technology leadership, technostress, and technology acceptance. The aim of this study is to investigate the relationship between technology leadership, technostress, and technology acceptance.

Although educational technology policies and standards have help to guide and define the role of school administrator as a technology leader, it is crucial to explore the technostress and the technology acceptance of the administrators. This study aims to investigate potential factors that contribute to reduction of administrators' technostress in terms of internal factors according to person environment theory.

Although there are plenty of researches on technology leadership, technostress, and technology acceptance, there are no studies that examine these three dimensions together. By exploring the structural relationships among the three dimensions, this study will complete this gap and contribute to the literature. The purpose of this study, then, is to explore the influence of technology leadership competencies on school administrators' technostress and technology acceptance in İzmir, Turkey. In the light of the literature, a hypothetical model has been put forward (Figure 1).

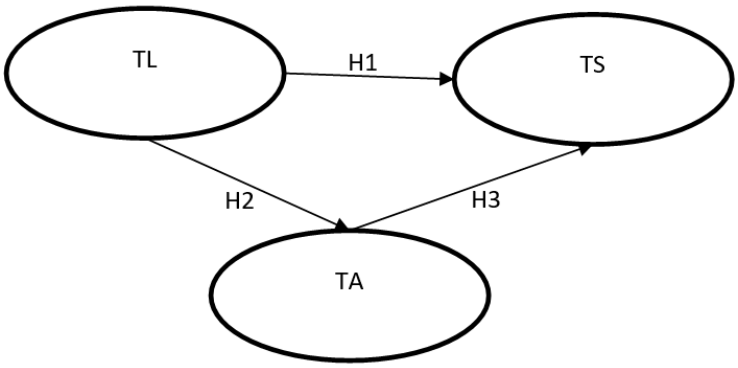

Figure 1. Hypothesized Model

Technology Leadership

With the integration of technology into all aspects of education administrators are expected to increase their competence in technology use and assume the responsibility in terms of technology use in managerial, instructional, and learning practices (Afshari et al., 2009). Irving (2010) states that leaders who value effective teaching and learning processes in the rapidly changing and developing digital age can take advantage of managing educational technologies as a power in education (Irving, 2010). It is possible to say that, in the 21st century, administrators who successfully introduce technologies in their schools make a significant contribution to education. It has become necessary for school administrators to have the competencies required by technology and to lead in effective and efficient use of technology in educational organizations. Leadership is often seen as a crucial factor in leading the required teaching and learning processes required to equip individuals with the necessary 21st-century knowledge and skills. This supports the recent shift in leadership toward supporting teaching and learning models that naturally incorporate digital technologies (Richardson & Sterrett, 2018). Brown (2014) points out that an educational leaders' success involves keeping a clear perception of how to assess the needs of a district, a school, or a classroom while aligning strategies, practices, and guidelines in a way that empowers the individual teacher effectiveness and student

learning success. He also emphasizes that educational technology leadership needs an attitude that views technology not as an instrument for any occasion, but as an instrument that will improve the learning process when used. In other words, to create change, technology leaders in school need to recognize both leadership skills and technology (Tillman, 2014). But it is important for school technology leaders to incorporate both educational technology and school leadership (Januszewski & Molenda, 2008; McLeod & Richardson, 2011). Creighton (2003) says that the school principal as a technology leader should design and implement strategies to support teachers in recognizing, understanding, and using technology in their classroom teaching and learning in the classroom. Hargreaves (2007) emphasizes that school administrators should be leaders who can make a difference in their schools and around the school rather than being practitioners of administrative processes and central education policies. Another study showed that technology is considered by principals to be essential for communication and teaching and they also see the benefit of using technology as platform for data sharing and management, administrative tasks and student teaching (Waxman, Boriack, Lee, & MacNeil, 2013). In a systematic review by Dexter and Richardson (2020), the results highlighted leadership strategies for professional capacity building, including providing teachers with learning resources, developing practice groups for them, recognizing their individualized needs and resolving access and support issues.

Many studies and researches have been conducted on technological leadership in the educational administration field. When the findings and results of the studies in the literature are examined, it's possible to state that administrators' technology leadership role is critical to the successful use of educational technologies. Teachers, school managers, and supervisors were inquired about the consistency of ISTE's (2009) NETSA technology leadership principles with the Turkish educational system as part of a study, the compatibility of the five key performance measures was found to be mostly positive among educators. "Visionary Leadership", "Digital Age Learning Culture", "Excellence in Professional Practice", "Systemic", and "Digital Citizenship" in the Turkish context. Supervisors, teachers, faculty members and teachers indicated the importance of digital citizenship (Hacifazlioglu, Karadeniz, & Dalgic, 2010).

A study points out the need to help school leaders build and actionable and manageable vision for leadership in school technology and it also shows that there are changes in visions of school technology leadership as the quality of the graduate coursework is closely associated with the NETS-A (Richardson, Flora, & Bathon, 2013). According to Banoglu (2011), school principals are "significantly" capable of technology leadership, but their competency in the "leadership & vision" dimension of technology leadership has the lowest importance of all the dimensions. In the same study female school principals were found to be more capable in the "leadership & vision" dimension of technology leadership than their male counterparts, and schools with information technology coordinator teachers were found to be more capable in the "learning & teaching" dimension. According to Durnali (2019) teachers' perceptions of secondary school principals' technical leadership activities of technology use by teachers are high in terms of all independent variables such as gender, age, working experience, education status, years of service at the same school, and the length of time working with the administrator. In their research, Karadeniz and Hacifazlioglu (2013) discovered four themes; funding and building ICT infrastructure, ICT maintenance, teacher professional development, and technology leadership.

According to the abovementioned researches, technology leadership strategies improve school effectiveness. However, a study showed that there is minimal research on school technology leadership in the field of school leadership and management of schools (Mcleod & Richardson, 2011). According to a report, there is a gap between administrators' and teachers' expectations for educators' skills to integrate technology and their access to technology-related professional development and in addition core technology leadership skills have produced important positive associations with the capacity of teachers to incorporate technology and their access to technology (Fisher & Waller, 2013). According to Hsieh, Yen and Kuan (2014), in order to accelerate teaching development in school activities, principals should introduce effective technology leadership.

Technostress

School administrators and teachers have important roles in integrating technology into the learning and teaching processes. From this perspective, it is possible to state that information technologies generally have an impact on staff and their work. In another concept that researchers currently focus on, technostress has become known as the disease of the modern age. Using technology can create additional workload, obstacles and difficulties (Voet & De Wever, 2017). Technologies may also be poorly established and create uncertainty and frustration when teachers lack expertise or are unable to do so (Dong et al., 2020). Individual stress caused by computer and technology usage was first identified as a modern adaptation disorder caused by an inability to adapt to emerging technology in a safe way (Brod, 1984).

Technostress is described by Berger, Romeo, Gidion and Poyato (2016) as an individual's feeling of stress induced by the use of ICT. Ragu-Nathan et al. (2008) regard technostress as a phenomenon that users experience in organizations over the use of ICT and the ability to cope with its ever-evolving nature. Okebaram (2013) states the reasons for technostress as follow: inexperience in computer use, performance anxiety and excessive information load, rate of change, increasing demands, excessive workload, and inadequate personnel. In terms of technostress sources, Harper (2000) categorizes excessive information load, routine work order, job insecurity, lack of motivation, and role ambiguity.

Goksun (2016) states that fears of technology's uncontrollability, violation of private, uncertainty, practicality, efficiency, foreign language issues, health issues, addiction, user satisfaction, aim to expand use, high expectation, multitasking, role ambiguity, productivity, overload in technology, and self-efficacy are all factors that contribute to technostress. A study by Cetin and Bulbul (2017) which examined the relationship between school administrators' perceptions of technostress and individual characteristics of innovation found that while school administrators' perceptions of technostress were moderate, individual levels of innovativeness were found to be in the questioning group. Akgun (2019) discovered that academics' technology acceptance levels were high on average, and their overall attitudes were positive; technostress levels were moderate, and the factor of perceived usefulness had the highest average ratings, suggesting that academics are open to implementing innovations into their teaching methods. A study which reviews literature on technostress creators and inhibitors since 2008 shows that the develop of technostress are a consistent negative influence on psychological and behavioral performance and people who encounter stressors associated with IT have a lower work satisfaction and lower performance (Sarabadani et al., 2018). Another research discovered a weak negative association between improved computer skills and lower levels of technostress (Shepherd, 2004). A study by Califf and Brooks (2020) claims that techno-insecurity, techno-invasion, and techno-overload both refer to burnout, but that supporting literacy can minimize the negative effects of techno-complexity, techno-insecurity, techno-invasion, techno-overload, and burnout. According to Ayyagari, Grover and Purvis (2011), the two most dominant stressors are found to be job overload and position uncertainty, while intrusive technology characteristics are found to be dominant stressor predictors. According to some research, higher computer self-efficacy is linked to a reduction in the negative effects of technostress (Tarafdar, Pullins, & Ragunathan, 2014). There are some researches that illustrate the rapid transformation process faced by school administrators (Naidu & Laxman, 2019). Support from the school community can be said to be a crucial factor in encouraging the intent of teachers to apply technology (Eickelmann, Gerick, & Koop, 2017; Drossel, Eickelmann, & Gerick, 2017).

Technology Acceptance

The teachers' and school administrators' technology acceptance and use are crucial for further development. Simon (2001) describes acceptance as in contrast to the term rejection, the constructive choice to use an invention. According to The Technology Acceptance Model (TAM) users are motivated by three factors: perceived utility, perceived ease of use, and attitude toward use. The user's attitude is heavily influenced by perceived usefulness and ease of use. These can be categorized as an unfavorability and favorability toward the system. External variables (user preparation, system

features, user engagement in design, and the essence of the adoption process are also considered in the TAM model (Lin, Fofanah, & Liang, 2011).

There are researches on technology acceptance in the literature. According to a report, top managers need to be creative in order for older adults to adopt modern technical devices (Hong, Hwang, Ting, Tai, & Lee, 2013). Tillman (2014) found no connection between the leadership styles of administrators and their acceptance and technology use in the classroom, and that school administrators' leadership style is neither an indicator nor a reliable predictor of their level of acceptance and use of technology. Oznacar and Dericioğlu (2017) points out that school administrator are unworried about the technology use in the classroom, but they struggle integration. According to a study by Powell (2020) the behavioral intent to follow software as a service model was significantly predicted by the independent variables effort expectation, social impact and performance expectation. A study by Wiltgen (2020) revealed that although educators have a limited understanding of emerging technologies and their role in the education process, these technologies' expectations would impact their perceptions in both positive and negative ways and in the same study suggested that if school leaders follow a set of recommendations expressed by their teachers, technology acceptance and psychological capital will be enhanced.

Based on the hypothesis model in Figure 1, the following hypotheses were investigated.

H1: Technology leadership has a negative effect on school administrators' technostress.

H2: Technology leadership has a positive effect on school administrators' technology acceptance.

H3: Technology acceptance has a negative effect on school administrators' technostress.

Integrated with the above hypotheses, the study aims to examine the structural relationships between the variables that technology leadership predicts. In this context, technology leadership is taken as a critical variable predicting technology acceptance and technology leadership (Figure 1).

Method

Resach model, participants, instruments, data collection and data analysis will be mentioned under this title.

Research Model

This research is designed as a correlational survey model as it aims to reveal the relationships between technology leadership, technostress and technology acceptance. The correlational survey model aims to determine the existence and / or degree of co-change between two or more variables. In this model, the relationships between the variables are not considered as a cause-effect relationship, but the determination of a variable allows researchers to make predictions about other variables (Karasar, 2005).

Participants

The participants of the study were 387 school administrators of K-12 schools in Izmir-Turkey. Convenient sampling was used on volunteer participants working in elementary, secondary, and high schools affiliated to the Ministry of National Education located in different 15 parts of Izmir-Turkey, Karabaglar, Konak, and Bornova. Karabaglar, Konak, and Bornova are among the most densely populated districts of İzmir-Turkey and located in the center of the city. Izmir is Turkey's 3rd largest city and has 30 districts. For reaching a robust and diversified sample of schools has been a point that researchers pay attention to. This sample was indicative of the broader teaching population of İzmir-Turkey in terms of accessibility to schools of different types with different socio-economic levels.

Demographic information is presented in Table 1. Table 1 shows that 68% were male and 32% were females, and 74.70%were from elementary schools. About half (51.70%) of the school administrators received in-service training in technology. The school administrators' ages ranged between 30 and over 50. Years of service ranged from 1 to 21 and above. While most of the school administrators (79.07%) had undergraduate degrees, about 17% held master's degrees. The ratio of

principals and vice principals is approximately half. While 66.07% of the school administrators do not have an IT class, 28.57% of them have an IT class.

Table 1. Demographic Information

	F	%		f	%
Gender			**Years of Service**		
Male	263	68.00	1-5	182	47.00
Female	124	32.00	6-10	83	21.50
Age			11-15	52	13.40
30 and below	10	2.58	16-20	30	7.70
31-40	122	31.52	21 and above	40	10.40
41-50	159	41.09	**IT-related In-service Training**		
51 and above	96	24.81	Yes	200	51.70
Title			No	187	48.30
Principal	215	55.60	**School Level**		
Vice-principal	172	44.40	Elementary	289	74.70
Education Status			High	80	20.60
Associate	16	4.13	Others	18	4.70
Bachelor	306	79.07	**IT Class Numbers at the School**		
Master	62	16.02	0	260	67.15
Doctorate	3	0.78	1	104	26.80
			2 and more	23	6.05

Instruments

The Technology Leadership Competency Scale for School Administrators, used in the study to explore the technology leadership of the participants, consists of 21 items. Hacifazlioglu, Karadeniz, and Dalgic (2011) adapted the technological leadership standards (NETS-A), into Turkish, and developed a valid and reliable measurement tool to measure the level of technological leadership of school administrators. The scale has five dimensions: 1) VL: Visionary Leadership (three items), 2) DALC: Digital Age Learning Culture (five items), 3) EPP: Excellence in Professional Practice (four items), 4) SI: Systemic Improvement (five items), 5) DC: Digital Citizenship (four items). All items are rated on a 5-point Likert scale, with 1 indicating strongly disagree to 5 indicating strongly agree. The Cronbach Alpha coefficient was .97 for the whole scale, ranging between .83 and .92 for the factors of the scale (Hacifazlioglu et al., 2011).

The Unified Theory of Acceptance and Use of Technology (UTAUT) 2 Scale was adapted by Yilmaz and Kavanoz (2017). It is used to assess the acceptance and technology use in the Turkish context. The 7-point Likert-type scale has 28 items with eight factors. The factors are as follows: 1) PE: Performance Expectancy (four questions), 2) EE: Effort Expectancy (four questions), 3) SI: Social Influence (three questions), 4) FC: Facilitating Conditions (four questions), 5) HM: Hedonic Motivation (three questions), 6) PV: Price Value (three questions), 7) H: Habit (four questions), 8) BI: Behavioral Intention (three questions). The Cronbach alpha values of the scale vary between .76 and .93 for eight different dimensions. All items in the scale except for the 15th item were preserved (Yilmaz & Kavanoz, 2017). However, according to the EFA results of this study, it was not necessary to drop the 15th item.

The Teachers' Technostress Levels Defining Scale (TTLDS) which was developed by Çoklar et al. (2017) and consists of 28 items. The scale includes five factors: 1) LTPO: Learning-Teaching Process Oriented (seven questions), 2) ProO: Profession Oriented (six questions), 3) TIO: Technical Issue Oriented (six questions), 4) PerO: Personal Oriented (five questions), 5) SO: Social Oriented (four questions). The minimum score of 28 items on the 5-point Likert-type scale is 28 while the highest is 140. The Cronbach alpha coefficient was calculated between .73 and .79 for five different dimensions (Coklar, Efilti, & Sahin, 2017).

The pilot study was conducted with 112 school administrators to increase the instruments' reliability and validity. For the pilot study, Cronbach's alphas and variance explained are presented in

Table 2. The Cronbach's alpha values being 0.79 to 0.98 indicate that reliability is provided (Cortina, 1993). The fact that Cronbach's alpha values are close to the values found in the development studies. It shows that these scales are suitable for the selected sample and can be used in the context of our study. EFA was performed in SPSS for construct validity. Sampling adequacy was measured by The Kaiser-Meyer-Olkin (KMO) while sphericity was determined by Barlett's test. Varimax was used as the rotation method. The factors in the Table 2 were found to be suitable for analysis of this sample. Explained variance values are presented in Table 2.

Table 2. Reliability and variance values of the pilot study

Dimension	Cronbach's alpha	Variance explained
The Technology Leadership Competency Scale		
Visionary Leadership	0.85	16.93%
Digital Age Learning Culture	0.91	24.39%
Excellence in Professional Practice	0.91	21.27%
Systemic Improvement	0.90	8.94%
Digital Citizenship	0.93	9.10%
The Unified Theory of Acceptance and Use of Technology Scale		
Performance Expectancy	0.94	17.61%
Effort Expectancy	0.92	12.49%
Social Influence	0.92	11.91%
Facilitating Conditions	0.86	9.76%
Hedonic Motivation	0.96	10.97%
Price Value	0.81	4.69%
Habit	0.86	11.12%
Behavioral Intention	0.93	6.54%
The Teachers' Technostress Levels Defining Scale		
Learning-Teaching Process Oriented	0.90	17.31%
Profession Oriented	0.85	12.72%
Technical Issue Oriented	0.89	13.20%
Personal Oriented	0.90	15.80%
Social Oriented	0.79	9.90%

Data Collection and Analysis

The data was collected through an online survey. Permission was obtained from the İzmir Provincial Directorate of National Education-Turkey. A total of 387 school administrators completed all three scales. In order to conduct this research, ethical permission was obtained from the Social and Human Sciences Research Ethics Committee of Istanbul University – Cerrahpasa with the date 15.04.2021 and number E-74555795-050.01.04-77271. All participants were volunteers and from public schools. The participants were informed about the purpose of the study, and they were all volunteered.

The SPSS 18.0 statistics program was used to assess the data. In the analysis of the obtained data, the SEM was conducted using the AMOS. The analysis of the study consists of two stages: Confirmatory Factor Analysis (CFA), and Path Analysis (PA). CFA was used to find relations between the observed measures and the underlying factors, and this hypothesized structure was tested statistically with SEM (Byrne, 2010). In models with more than seven constructs, the sample size should consist of a minimum of 150 participants. In principle the large sample size provides stability (Hair, Black, Babin, & Anderson, 2009).

For SEM, the data met the multivariate normality assumption (Byrne, 2010). The CFA and PA was obtained by AMOS and maximum likelihood estimation. Comparative fit index (CFI), Tracker-Lewis index (TLI), the normed fit index (NFI), and root-mean-square error of approximation (RMSEA) were carried out also (Byrne, 2010).

Results

Descriptive data is presented in Table 3. Skewness and Kurtosis values between +3 and -3 indicate that scores are normally distributed.

Table 3. Descriptive Statistics

Dimension	M	SD	Skewness	Kurtosis
The Technology Leadership Competency Scale	**84.65**	**17.07**	**-1.08**	**1.60**
Visionary Leadership	12.18	2.68	-1.27	2.41
Digital Age Learning Culture	19.94	4.31	-1.09	1.81
Excellence in Professional Practice	16.37	3.37	-1.00	1.02
Systemic Improvement	19.89	4,45	-1.00	1.16
Digital Citizenship	16.26	3.52	-1.15	1.46
The Unified Theory of Acceptance and Use of Technology Scale	**171.68**	**20.55**	**-1.06**	**1.22**
Performance Expectancy	26.18	2.87	-1.80	3.09
Effort Expectancy	24.76	3.36	-1.09	1.43
Social Influence	18.29	2.98	-1.16	1.43
Facilitating Conditions	23.56	3.41	-0.59	0.04
Hedonic Motivation	18.79	2.72	-1.31	1.51
Price Value	17.63	2.88	-0.82	0.74
Habit	24.03	3.64	-0.91	0.73
Behavioral Intention	18.45	2.68	-1.08	0.92
The Teachers' Technostress Levels Defining Scale	**67.76**	**25.39**	**0.34**	**-0.38**
Learning-Teaching Process Oriented	18.98	7.21	-0.01	-0.84
Profession Oriented	11.85	5.73	0.94	0.28
Technical Issue Oriented	16.16	6.75	0.12	-0.90
Personal Oriented	10.45	5.06	0.79	-0.11
Social Oriented	10.33	4.40	0.24	-0.76

Figure 2 shows the SEM. The parameter estimates for the five constructs (VL, DALC, EPP, SI, DC) were significant (.86, .91,.94, .95, .89). The parameter estimates for the five constructs (LTPO, ProO, TIO, PreO and SO) were significant (.84, .82,.82, .81, .83). The parameter estimates for the eight constructs (PE, EE, SI, FC, HM, PV, H, BI) were significant (.73, 82, .79,.76, .86, .78, .88, .82). Moreover, teacher technology leadership predicted technostress and technology acceptance directly. In addition, technology acceptance predicts technostress.

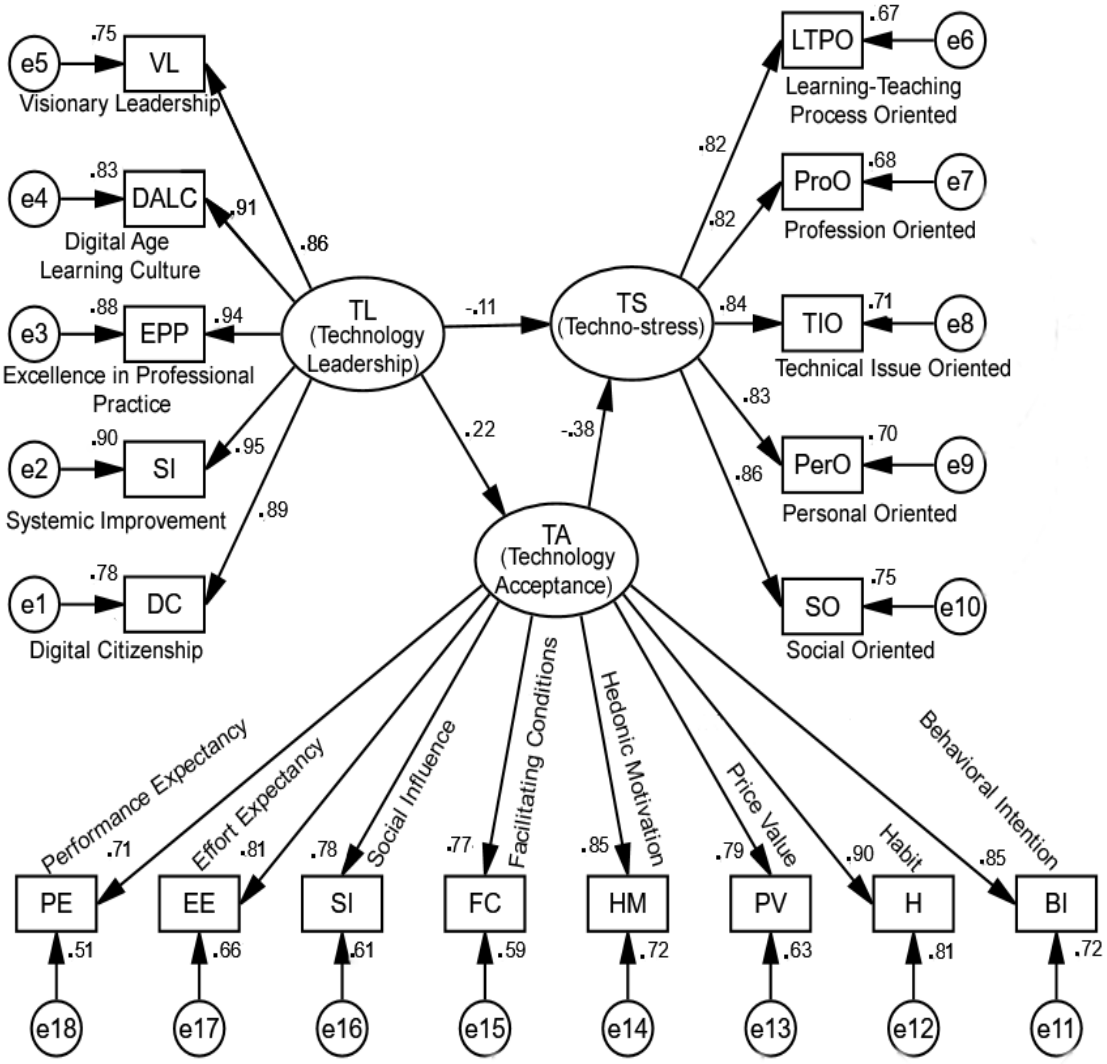

Figure 2. Structural Equation Model (Standardized Coefficient Estimates)

Table 4 shows the model fit measurements. The SEM fit indices provide information of the fit of the model to the data. The overall goodness of fit can be measured satisfactorily for the Hypothesized Model. $\chi 2$ /df = 3.37, TLI = .94, NFI = .93, CFI = .95, RMSEA = .07, as shown in Table 4. This addresses the satisfactory fitness for the hypothetical model.

Table 4. Model Fit Measurements

	TL (Technology Leadership)	TA (Technology Acceptance)	TS (Technostress)	Model	Criteria	Rationale
$\chi 2$	514.35	831.86	854.20	444.66	-	-
Df	174	319	329	132	-	-
$\chi 2$/df	2.95	2.60	2.59	3.37	<5	Wheaton, Muthen, Alwin and Summers (1977)
TLI	.96	.94	.93	.94	≥.92	Tabachnick and Fidell (2007)
NFI	.95	.92	.90	.93	≥.90	Tabachnick and Fidell (2007)
CFI	.96	.95	.93	.95	≥.90	Tabachnick and Fidell (2007)
RMSA	.07	.06	.06	.07	<.08	Browne and Cudeck (1993)

Table 5 shows that the path coefficients of the hypothesized model TL (β = -.11, $p < .05$) and TA (β = -.39, $p<.001$) had significant negative effects on technostress. They provide support for H1 and H3. In addition, TL (β =.21, $p <.001$) had a significant positive effect on TA. This provides support for H2.

Table 5. Results of the Hypothesis

Hypothesis	Path	Unstandardized coefficient (B)	Standardized coefficient (β)	SE	T	Supported?
H1	TL-->TS	-0.21	-0.11	0.10	-2.06*	Yes
H2	TL-->TA	0.15	0.21	0.04	3.99**	Yes
H3	TA-->TS	-1.07	-0.39	0.15	-7.04**	Yes

*p<.05, **p<.001

Discussion

The results show that technology leadership competencies and technology acceptance levels play a crucial function in helping administrators cope with the psychological stress caused by technology. It is thought that the rate of using technology can increase as school administrators accept technology for the educational environment. In addition, as a technology leader, it will be possible for teachers and administrators in the school to use technology and guide them. In addition, the fact that administrators have less technostress may positively affect teachers' technostress levels. In different studies, it has been observed that the computer use competencies reduce technostress (Paul & Glassman, 2017; Shu, Tu, & Wang, 2011; Tarafdar et al., 2014). A study shows that low-level individual ability such as ICT literacy positively predict technostress (Salanova, Llorens, & Cifre, 2013).

The more technological leadership competency of school administrators increases, the more their technostress will decrease. Since technology leadership can also include practical sub-skills, increasing the competence in this skill indicates that administrators can reduce their technostress levels. It is thought that their knowledge and skills about technology use will increase and their fear and anxiety may decrease. In this way, administrators can conduct their duties such as using educational technology as technology leaders, promoting, guiding and supporting teachers in the use of in-class/out-of-class technologies. Different studies have found results supporting this (Banoglu, 2011; Hacifazlioglu et al., 2011; Omar & Ismail, 2020; Weng & Tang, 2014). Similar to the results of this research, Cetin and Bulbul (2017) found a negative relationship between technostress and individual innovation. Goksun (2016) determined that self-efficacy predicts technostress. Akgun (2019) found academics' technology acceptance levels were high on average. However, technostress levels were moderate. There are some studies with contrasting results to this. There is also research that indicates any technology acceptance has no effect on technostress (Gerald, 2020).

Technology leadership competency has a significant effect on levels of technostress (Omar & Ismail, 2020). Researches show that competence in technology is a major factor in technostress and the indirect impact of computer self-efficacy on technostress is greater than the direct impact on computer competency (Al-Fudail & Mellar, 2008). When an individual's required technological competence exceeds his or her current abilities, stress occurs (Fuglseth & Sørebø, 2014). Wright (2014) showed that school staff had positive attitude with their technical skills and high levels of self-efficacy. Long-term support is needed to achieve the required level of experience and design skills (Koh, Chai, & Lim, 2017). School leaders should create strategies and professional development initiatives aimed at improving school administrators' ability to use technology effectively (Wei, Piaw, & Kannan, 2017).

Since administrators with technology leadership skills undertake roles such as incorporating technology in administrative and educational works in the school environment, it can also facilitate their acceptance and use of these technologies. The study supports the results of the other studies, as technology leadership competency increases, the level of technology acceptance increases, and this indirectly decreases technostress (Goksun, 2016; Karadeniz & Hacifazlioglu, 2013; Omar & Ismail, 2020; Weng & Tang, 2014). In this context, technology leadership competencies and technology acceptance levels of the school administrators should be increased. This may take time but increasing these competencies may contribute to reducing technostress level.

Conclusion

This study aims to review the influence of technology leadership competencies on school administrators' technostress and technology acceptance in İzmir, Turkey. The results show that technology leadership has a remarkable and direct effect on levels of technostress and technology acceptance. In addition, technology acceptance predicts technostress. Technology leadership and technology acceptance have statistically significant negative effects on technostress. Technology leadership has a statistically significant positive effect on technology acceptance. The established hypothesis model was confirmed with the analyses. The more the technology acceptance and technology leadership competency of school administrators increases, the more their technostress will decrease. In addition, as technology leadership competency increases, the technology acceptance level increases and this situation indirectly decreases technostress.

One suggestion is to provide technological support and create opportunities to obtain resources. Increasing the abovementioned competencies of school administrators who are also technology leaders in schools and increasing their acceptance of new technologies is a key factor that will contribute to their professional development. In this way, it can be easier for managers to cope with the stress caused by technology. The following suggestions can be given for policy makers. Developing these competencies takes long time, therefore adequate trainings, supervision should be provided to administors. Face-to-face and online training should be provided to increase school administrators' knowledge of and positive attitudes toward technology. It is important to provide hands-on training to meet the needs of administrators. In this way, their knowledge and skills regarding the use of technology will also increase. Another important suggestion is to designing training related to real life technology use. School administrators' technology acceptance levels can increase in this way. Besides, policy makers can implement mentoring and e-mentoring practices. The school administrators can have mentoring/e-mentoring support from experienced technology leaders.

Researchers can investigate problems with technology use. In-depth analysis can be done. The problems they may encounter when using technology should also be addressed by researchers, thus reducing levels of technostress. Further studies need to be conducted with administrators on educational technology integration. Research can be conducted on how technology integration can be achieved. In this regard, studies can be carried out to apply different integration models. Technology leadership dimensions can be studied. The influence of technology leadership sub-factors can be investigated. Besides, school administrators who are technology leaders in the school can also support teachers. As technology leaders, the effects of administrators on teachers about educational technology use can be investigated. It is also important for school administrators to assess their professional technological plans and give teachers performance.

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