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An in-depth look into perceived technology proficiency of Turkish teachers of English and their technology practices

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Abstract

Lots of innovations have been introduced into our lives with the 21st century. They offer great affordances and are benefited in every sphere of life. On the other hand, these innovations change our habits, including our teaching/learning habits. Therefore, actors in educational environments, especially teachers, have to keep pace with such changes, which requires being competent in the use of technological devices. Starting from this point of view, this study attempts to find out how Turkish teachers of English are doing in this process, and if such variables as their sex, age, what level they teach, whether they teach at a private or state institution, how long they have been teaching, and the duration of time they spend in technological environments affect their perceived technology proficiency. Survey research method was used, and data was collected via the Technology Proficiency Self-Assessment Questionnaire for 21st Century Learning (TPSA C-21) (Christensen & Knezek, 2017) from 273 participants. The results indicate that the participants' gender, age, years of teaching experience and what level they teach do not affect their perceived technology proficiency while how much time they spend in technological environments and whether they teach at a public or private school do.

1. Introduction

Change is a fundamental part of human life and it manifests itself through different ways. Today, technology is the most ubiquitous precursor of change and human practices have been evolving thanks to it. Educational practices have also taken their share from this period of change. Teaching and learning are very different from what they used to be because the 21st century has brought along great innovations and traditional four-walled classrooms are gradually becoming things of the past. This process has accelerated with the COVID-19 outbreak, which has made people dependent on electronic devices more than ever. The literature also began to question the effectiveness of classroom-based instruction (Benade, 2017; Nair, 2011). This issue was approached by the media too. On the cover of its December 2006 issue, Time wrote "How To Build a Student For the 21st Century" (How To Build a Student For the 21st Century, 2006). The writers of the corresponding article stated that classroom practices failed to keep up with the advances technology offers (Wallis & Steptoe, 2006). It was argued that this had not changed by 2017 (Lubelfeld & Polyak, 2017), and it seems this still holds true today. This could partly be overcome by having students develop 21st century skills. There are various frameworks which show what these skills are, and were

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prepared by such institutions as Battelle for Kids (Partnership of 21st Century Learning, 2019), National Research Council (Pellegrino & Hilton, 2013), and World Economic Forum (2015).

One intersection point of these frameworks is technology competence, which is described as "the ability to create and use a particular field of technology effectively, which is gained through extensive experimentation and learning in its research, development and employment in production" (Fai & von Tunzelmann, 2001, p.142). Technology competence, or digital competence, also falls into the eight key competences for lifelong learning that European Union (2006) introduced. It could be defined as:

> …the set of knowledge, skills, attitudes, abilities, strategies and awareness that are required when using ICT (Information and communications technology) and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning and socializing (Ferrari, 2012, p. 30).

This definition suggests that digital competence is much more complex than just being able to use electronic devices well. When it comes to teachers' digital competence, it gets even more complex because they also have to transfer information to their audience (Krumsvik, 2008). According to ISTE (International Society for Technology in Education) Standards, educators must "facilitate and inspire student learning and creativity", "design and develop digital age learning experiences and assessments", "model digital age work and learning", "promote and model digital citizenship and responsibility", and "engage in professional growth and leadership" (ISTE, n.d.). To achieve these requirements, educators must possess digital competence, self-efficacy (Bandura, 1993) and Technological Pedagogical Content Knowledge (TPACK) (Koehler & Mishra, 2009). Self-efficacy posits that educators must believe in their own skills in order to establish beneficial learning environments so that their learners' performance improves (Bandura, 1993). TPACK denotes the domains of knowledge educators must have in order to integrate technology into their classes (Koehler & Mishra, 2009). Besides, Christensen and Knezek (2018) argue that "positive attitudes and long-standing positive dispositions" (p. 358) are also necessary. Teachers' social awareness (Zhao, Pugh, Sheldon, & Byers, 2002); competence in planning and teaching their courses, being ethically conscious, innovative, able to solve problems and knowledgeable in their own field (Kabakci Yurdakul et al., 2012); ability to form an appropriate environment to make use of technology and to have students take a favorable stance towards technology integration (Guzman & Nussbaum, 2009); having a grasp of a variety of pedagogic approaches so as to utilize technology effectively in class and to have students develop 21st century skills (Voogt, Fisser, Pareja Roblin, Tondeur, & van Braak, 2013) are among other things that have been argued to be required in this process.

Despite its complexity and multifaceted nature, technology has been studied to a great extent in the literature and found to offer a great number of affordances in language classrooms in various contexts such as in-class contexts (Byrd & Lansing, 2016; Ebrahimzadeh & Alavi, 2017; Eppard, Nasser, & Reddy, 2016; Reynolds & Kao, 2019; Samur, 2019; Uzun, 2017; Yang, Quadir, & Chen, 2016), outside-class contexts (Ibrahim, 2019; Lai, 2015; Lai, Yeung, & Hu, 2016; Scholz, 2017), both in- and outside-class context (Basal, 2015b; Evseeva & Solozhenko, 2015; Girmen & Kaya, 2019; Hung, 2018; Kurt, 2017; Lee, 2019; Tan, 2018), education of the underprivileged (Dey & Bandyopadhyay, 2019; Sirin, Plass, Homer, Vatanartiran, & Tsai, 2018; Westin, Männikkö Barbutiu, Perera, & Anuradha, 2016), education of the disabled (Abdallah & Fayyoumi, 2016; Ok & Rao, 2017; Saad, Dandashi, Aljaam, & Saleh, 2015; Singh & Kaur, 2016), teacher education (Benitt, Schmidt, & Legutke, 2018; Howard & Scott, 2017; Kessler & Hubbard, 2017). Although the affordances that technology offers are numerous and undeniable, it is not integrated into today's classrooms as much as desired. Regarding this matter, Ertmer (1999) came up with first-order (external) and second-order (internal) barriers to technology integration. The former refer to issues not related to educators themselves, such as insufficient infrastructure and training. Actors other than educators account for the elimination of these barriers. The latter, on the other hand, refer to issues related to educators themselves. Elimination of one of these barriers would not be sufficient for technology to be integrated successfully. Initiated in Turkey in 2010, the Fatih Project, i.e. Movement to Increase

Opportunities and Technology, serves a good example. Huge investments were made and first-order barriers were attempted to be eliminated, but second-order barriers were overlooked and desirable results could not be achieved (Bildircin, 2018; Cumhuriyet, 2018; Evrensel 2019). Both barriers must be removed for successful technology integration. Besides, Tsai and Chai (2012) claim that there is also third-order barrier, which is "the lack of design thinking by teachers" (p.1), and all three barriers must be eliminated.

As discussed before, technology use in education has yielded positive outcomes, but this does not mean that educators are able to incorporate technology in their teaching effectively (Farjon, Smits, & Voogt, 2019). At this juncture, the present study focuses on self-efficacy in addition to digital competence. Technological self-efficacy of pre-service teachers seem to be high (Çelik & Karamustafaoğlu, 2016; Çoklar & Odabaşı, 2009; Çubukçu & Çeliker, 2016; García-Martín & García-Sánchez, 2017; Kavanoz, Yüksel, & Özcan, 2015; Solak & Çakır, 2014; Şirin & Duman, 2013; Üstündağ, Güneş, & Bahçivan, 2017), which is not surprising as most of the participants, arguably all of them, were digital natives. In-service teachers' technological self-efficacy, on the other hand, has not received as much attention as their pre-service counterparts', and both are found to differ from each other (Yeh, Hsu, Wu, Hwang, & Lin, 2014) and the former tends to be unsatisfactory (Ardıç & Çiftçi, 2019; Bas & Senturk, 2018; Beşoluk, Kurbanoğlu, & Önder, 2010; Ursavaş, Yalçın, & Bakır, 2019) compared to the latter.

2. Problem Situation

Black (2010) argues that the first generation of digital natives were born in the late 1980s and early 1990s, when personal computers and internet access became widespread. This means digital natives began to undertake the role of a teacher in class within the last two decades, and most teachers are digital immigrants, who might not have technology proficiency.

On the other hand, most of the literature assesses pre-service teachers' technology proficiency (Atar, Aydın, & Bağcı, 2019; Bağcı & Atar, 2019; Basal, 2015a; Başal & Kaynak, 2020; Hana, 2020; İşler & Yıldırım, 2018; Liza & Andriyanti, 2020; Pace, Rodesiler, & Tripp, 2010; Raman, 2014; Sarıçoban, Tosuncuoğlu, & Kırmızı, 2019; Schieble, 2010; Solak & Çakır, 2014; Tachaiyaphum & Hoffman, 2018; Tseng, Cheng, & Yeh, 2019), but they are already digital natives and proficient technology users (Howlett & Waemusa, 2018; Lee & James, 2018). However, there are limited number of studies that assess perceived technology proficiency of in-service teachers, more specifically that of Turkish teachers of English, (Akturk & Ozturk, 2019; Ardıç & Çiftçi, 2019; Ergen, 2019; Köse, 2016; Özel & Arıkan, 2015), most of whom are digital immigrants (Howlett & Waemusa, 2018; Lee & James, 2018; Prensky, 2001) and might be incompetent users of technology. Setting out with this idea, the researcher aims to analyze the perceived technology proficiency of in-service Turkish teachers of English. Furthermore, Kahraman and Yılmaz (2018) mentioned that analyzing educators' ICT (Information and communications technology) proficiency occasionally via a reliable tool that represents technological innovations is necessary because technology keeps improving all the time.

In addition, the learning habits of the 21st century students have changed to a large extent. Prensky (2001) implies that the education systems of the past cannot fulfil the expectations of today's students. They would like to make use of smartphones, computers etc. in class, and a contemporary teacher should be able to fulfil this expectation. However, Ertmer and Ottenbreit-Leftwich (2010) argue that the affordances that technology offers are not taken advantage in educational environments as much as desired. The present study attempts to find out if this still holds true and how well Turkish teachers of English are doing in meeting this expectation.

Finally, due to COVID-19, technology has become much more ingrained into our lives, and online lessons have become the only means to continue education. Under the circumstances, in-service teachers' technology competence has risen to prominence. More research is required in this field since the more we know about in-service teachers' technological self-efficacy and attitudes towards technology integration, the better we can pave the way for 21st-century classrooms (Ergen, 2019).

Bearing all these in mind, this study aims to contribute to the literature by assessing technology self-efficacy of in-service Turkish teachers of English. In this regard, self-assessment scales provide useful tools to obtain opinions on technology incorporation in educational settings (Christensen & Knezek, 2018). To that end, TPSA C-21 (Technology Proficiency Self-Assessment for 21st Century Learning) (Christensen & Knezek, 2017) was used to collect data in this study.

All things considered, the following research questions were formulated:

1. Is there a meaningful relationship between the sex of Turkish teachers of English and their perceived technology proficiency?

2. Is there a meaningful relationship between the age of Turkish teachers of English and their perceived technology proficiency?

3. Is there a meaningful relationship between the level Turkish teachers of English teach and their perceived technology proficiency?

4. Is there a meaningful relationship between whether Turkish teachers of English teach at a state or a private institution and their perceived technology proficiency?

5. Is there a meaningful relationship between years of teaching experience of Turkish teachers of English and their perceived technology proficiency?

6. Is there a meaningful relationship between how much time Turkish teachers of English spend in technological environments and their perceived technology proficiency?

3. Method

Survey research design was applied in this study. It is defined as "a collection of information from a sample by asking questions in order to describe some aspects of the population of which the sample is a part" (Fraenkel & Wallen, 2006, p. 423). Out of survey research designs, questionnaire, which is the most preferred data collection tool and defined as a set of questions and/or items following an order to collect data from individuals about a specific topic (Lavrakas, 2008), was used.

3.1. Data Collection

The data collection instrument of the study had 3 parts. The first one included the purpose of the study, and the researcher's name and contact information. In the second part, the participants' age and gender, the level they teach, whether they teach at a state or private school/university, the duration of their teaching experience, and the duration of time they spend on digital environments were asked. In the last part, TPSA C-21 was applied. The questionnaire was recreated on Google Forms. A shortened URL (bit.do/tech-proficiency) and a QR code were created in order to deliver it to the participants easily.

TPSA C-21 is the enhanced form TPSA, which was created by Ropp (1999) so as to examine technological self-efficacy of teachers. Due to the advancements in technology in recent years, TPSA had to be updated. Fourteen new items under 2 sub-dimensions, i.e. emerging tools and teaching with emerging technologies, were added by Christensen and Knezek (2017) to the pre-existing 20 items under 4 sub-dimensions, i.e. "using electronic mail, using the World Wide Web (WWW), using technology applications, and teaching with technology" (Christensen & Knezek, 2017, p.20). As a result, TPSA C-21 has 34 items under 6 sub-dimensions. The 7th item, which states "I feel confident that I could… search for and find the Smithsonian Institution Web site" was omitted after obtaining confirmation from an expert in the field of English language teaching since it possesses no indicative characteristics because the intended population is not familiar with Smithsonian Institution and there are not any equivalent Turkish organizations that can be replaced. Thus, the TPSA C-21 that was used in the present study has 33 items, each of which is structured on a 5-point Likert scale. Figure 1 shows the sub-dimensions and the items falling under them.

Christensen and Knezek (2017) ran reliability analysis and the Cronbach's alpha values were found to range between .75 and .93. The former corresponds to high reliability and the latter excellent reliability according to Hinton, McMurray and Brownlow (2014), who suggest that "0.90 and above shows excellent reliability;

0.70 to .90 shows high reliability; 0.50 to .70 shows moderate reliability; 0.50 and below shows low reliability" (p. 359). The Cronbach's alpha value for entire TPSA C-21 was found .96, which also corresponds to excellent reliability. The researcher also tested reliability via a pilot study, in which the Cronbach's alpha values were found to range between .536 and .908, and that of the entire questionnaire was found .945. The Cronbach's alpha values that both Christensen and Knezek (2017) and the researcher found are shown in Table 1.

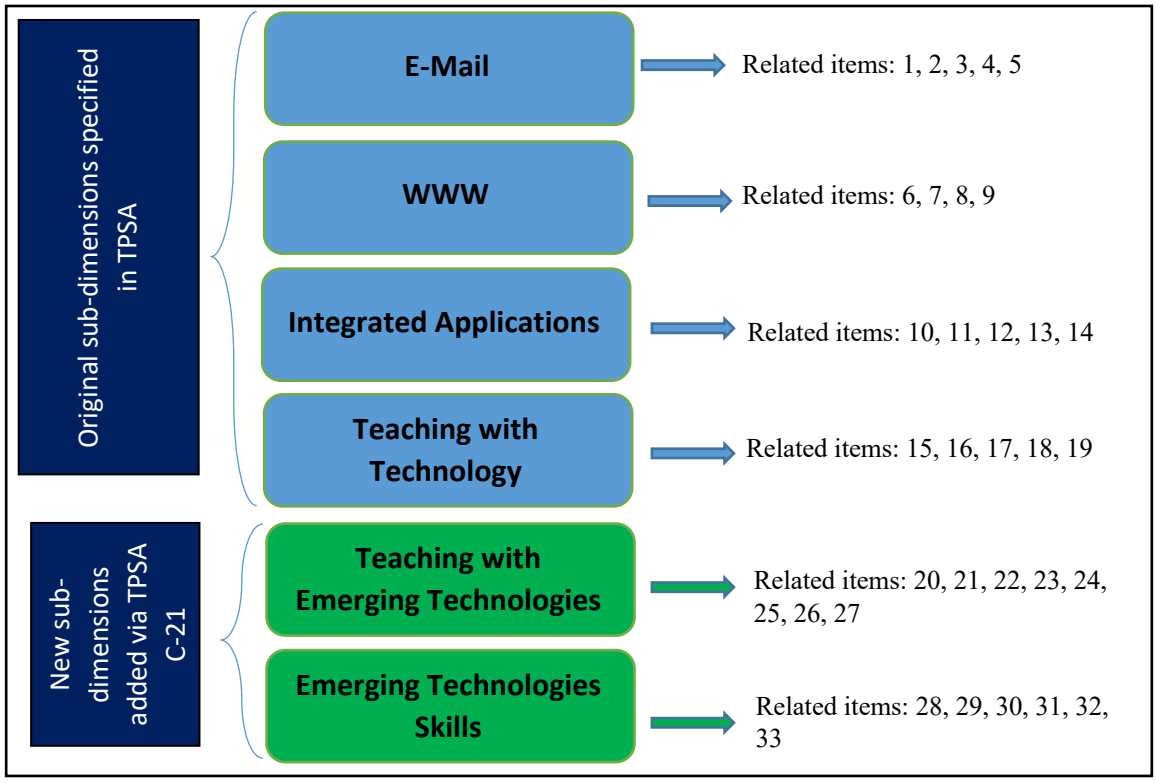

Fig. 1. Sub-dimensions of TPSA C-21 and items corresponding to them

Table 1.

Reliability (Cronbach's alpha) values of the six sub-scales and of the entire questionnaire

	TPSA C-21 (Christensen & Knezek, 2017) α	TPSA C-21 used in the present study α
E-mail scale	.76 (High Reliability)	.83 (High Reliability)
WWW scale	.75 (High Reliability)	.54 (Moderate Reliability)
Integrated Applications scale	.84 (High Reliability)	.79 (High Reliability)
Teaching with Technology scale	.89 (High Reliability)	.86 (High Reliability)
Teaching with Emerging Technologies scale	.93 (Excellent Reliability)	.91 (Excellent Reliability)
Emerging Technologies Skills scale	.84 (High Reliability)	.84 (High Reliability)
Entire questionnaire	.96 (Excellent Reliability)	.95 (Excellent Reliability)

Furthermore, the Kaiser–Meyer–Olkin (KMO) coefficient and Bartlett's value were found to be .824 and .000 respectively. According to Pallant (2001), the former has to be at least .60 and the latter lower than .05 so that factor analysis could be performed. Since the obtained scores were in line with this statement, factor analysis (principal components, varimax rotation) was run and the item loading values were calculated, which were found to range between .530 (Item 9) and .849 (Item 10). Pallant (2001) states that if an item loading value is higher than .4, it corresponds to strong loading and ought not to be discarded. Therefore, no items were discarded from the study. Next, total item correlation values were calculated and found to

range between .301 (Item 5) and .792 (Item 24). Büyüköztürk (2011) states that a value of .4 or higher refers to excellent and that between .3 and .4 good item distinctiveness; an item with a value between .2 and .3 ought to be revised, and that with a value of .2 or less ought to be discarded. Therefore, no items were revised or discarded. All these show that TPSA C-21 adopted in the study is a reliable and valid tool.

3.2. Participants

The participants of the study were reached via the convenience sampling method, according to which "members of the target population are selected for the purpose of the study if they meet certain practical criteria, such as geographical proximity, availability at a certain time, easy accessibility, or the willingness to volunteer" (Dörnyei, 2007, p.98-99), and via snowball sampling method, in which the participants are asked to distribute the data collection tool to others falling under the scope of the study so that more prospective participants are reached (Biernacki & Waldorf, 1981). In the end, 273 (214 females, 59 males) participants took part in the study. The distribution of age and gender of the participants, what level they mainly teach, how long they have been teaching English, and how much time they spend in technological environments are given in Table 2, 3, 4, and 5, respectively.

Table 2.

Demographic data of the participants

Variables		F	%
Age			
	20-29	77	28.21%
	30-39	154	56.41%
	40-49	34	12.45%
	50-59	8	2.93%
Gender			
	Female	214	78.39%
	Male	59	21.61%

Table 3.

Data related to what level the participants teach and whether they teach at a private or state institution

Variables			F	%
Level				
	Primary school		32	11.72%
	Secondary school		93	34.07%
	High school		47	17.22%
	University		101	37.0%
Private or State?				
	Private institution		114	41.76%
		Primary school	13	4.76%
		Secondary school	13	4.76%
		High school	11	4.03%
		University	77	28.21%
	State institution		159	58.24%
		Primary school	19	6.96%
		Secondary school	80	29.30%
		High school	36	13.19%
		University	24	8.79%

Table 4.

Data showing how long the participants have been teaching English

Variables		F	%
Range of years			
	Less than 1 year	8	2.93%
	1 – 3 years	34	12.45%
	4 – 6 years	57	20.88%
	7 – 9 years	61	22.34%
	10 – 14 years	59	21.61%
	15+ years	54	19.78%

Table 5.

Data showing how much time the participants spend in technological environments in a day

Variables		F	%
Range of hours			
	0 – 3 hours	63	23.08%
	3 – 6 hours	126	46.15%
	6 – 9 hours	59	21.61%
	+9 hours	25	9.16%

3.3. Data Analysis Procedures

The collected data were analyzed via SPSS 22. Independent-samples t-test and ANOVA tests were run. Gravetter, Wallnau, Forzano and Witnauer (2011) state that before performing these two types of tests, independence of observations, normality and homogeneity of variance should be achieved. The data were found normally distributed and homogeneous.

4. Results

Before answering the research questions, the mean scores of the answers given to each item were calculated and found to vary between 3.15 (Item 7 - I feel confident that I could create my own web page) and 4.71 (Item 4 - I feel confident that I could send a document as an attachment to an e-mail message and Item 6 - I feel confident that I could use an Internet search engine (e.g., Google) to find Web pages related to my subject matter interests). The mean score of entire TPSA C-21 was found to be 4.19.

4.1. Relationship between Sex and Perceived Technology Proficiency of Turkish Teachers of English

This research question was analyzed via an independent-samples t-test, and the significance value was not meaningful, which means sex does not affect the technology proficiency of Turkish teachers of English. The related data are given in Table 6.

Table 6.

Relationship between sex and technology proficiency of Turkish teachers of English

		n	Mean	Std. deviation	df	t	p
Perceived technology proficiency	Female	214	4.17	.62	271	-1.070	.286
	Male	59	4.27	.73			

4.2. Relationship between Age and Perceived Technology Proficiency of Turkish Teachers of English

The second research question was analyzed via an ANOVA test. The significance value was higher than .05, i.e. not meaningful, suggesting that age does not affect the technology proficiency of Turkish teachers of English. The related data are shown in Table 7.

Table 7.

Relationship between age and technology proficiency of Turkish teachers of English

	Sum of squares	df	Mean square	F	p
Between groups	3.141	3	1.047	2.576	.054
Within groups	109.334	269	.406		
Total	112.475	272			

The younger participants tend to have higher mean scores compared to their older counterparts, but this difference is not meaningful. The mean scores for each age range, i.e. 20-29, 30-39, 40-49, and 50-59, are 4.32, 4.17, 4.13, and 3.72 respectively.

4.3. Relationship between the Level Turkish Teachers of English Teach and their Perceived Technology Proficiency

This research question was also analyzed via an ANOVA test. The result is not significant (p=.371), which means what level Turkish teachers of English mainly teach is not effective in their technology proficiency. The related data are given in Table 8. The mean scores of each teaching level, i.e. primary school, secondary school, high school, and university, are 4.24, 4.12, 4.13, and 4.27 respectively.

Table 8.

Relationship between the level Turkish teachers of English teach and their perceived technology proficiency

	Sum of Squares	df	Mean Square	F	p
Between Groups	1.300	3	.433	1.049	.371
Within Groups	111.175	269	.413		
Total	112.475	272			

4.4. Relationship between Whether Turkish Teachers of English Teach at a State or a Private Institution and Their Technology Proficiency

This research question was analyzed via an independent-samples t-test. A significant difference was found, which suggests that whether Turkish teachers of English teach at a state or a private institution affect their perceived technology proficiency. The related data are presented in Table 9. The effect size was also calculated and found .04, which refers to small/moderate effect according to Pallant (2001), who suggests "0.01=small effect, 0.06=moderate effect and 0.14= large effect" (p.181).

Table 9.

Relationship between whether Turkish teachers of English teach at a state or a private institution and their technology proficiency

		n	Mean	Std. deviation	df	t	p
Perceived technology proficiency	Private	114	4.34	.59	271	3.311	.001
	State	159	4.09	.66			

4.5. Relationship between Years of Teaching Experience of Turkish Teachers of English and Their Perceived Technology Proficiency

This research question was analyzed via an ANOVA test. No significant difference was found. In other words, the number of years of teaching experience of Turkish teachers of English is not effective in their perceived technology proficiency. The related data are shown in Table 10, the mean scores of each group are presented in Table 11.

Table 10.

Relationship between years of teaching experience of Turkish teachers of English and their technology proficiency

	Sum of Squares	df	Mean Square	F	p
Between Groups	1.422	5	.284	.684	.636
Within Groups	111.053	267	.416		
Total	112.475	272			

Table 11.

Mean scores of each range of teaching years

Range of teaching years	Mean score	N
Less than 1 year	4.28	8
1-3 years	4.22	34
4-6 years	4.25	57
7-9 years	4.26	61
10-14 years	4.14	59
15+ years	4.08	54

4.6. Relationship between How Much Time Turkish Teachers of English Spend in Technological environments and Their Perceived Technology Proficiency

This research question was analyzed via an ANOVA test, and a significant difference was found, which means how much time Turkish teachers of English spend in technological environments is effective in their perceived technology proficiency. The related data are provided in Table 12.

Table 12.

Relationship between how much time Turkish teachers of English spend in technological environments and their perceived technology proficiency

	Sum of Squares	df	Mean Square	F	p
Between Groups	7.221	3	2.407	6.151	.000
Within Groups	105.254	269	.391		
Total	112.475	272			

The mean scores for each group are presented in Table 13.

Table 13.

Mean scores of each time range

Range of time spent in technological environments	Mean score	N
0-3 hours	4.04	63
3-6 hours	4.11	126
6-9 hours	4.39	59
9+ hours	4.52	25

Since the difference is significant, a post-hoc test called Bonferroni was performed to find out the relationship between each group. The results can be seen in Table 14.

5. Discussion

The findings obtained in the present study show that overall technology competence of in-service Turkish teachers of English is satisfactory. Some studies in the literature yield similar results (e.g. Akcaoğlu, 2008; Çakır & Oktay, 2013; Çetin & Güngör, 2014; Durak, 2019; Kahraman & Yılmaz, 2018; Kazu & Erten, 2014; Şimşek & Yazar, 2017; Turel, 2014). There are also those with contradicting findings. Bas and Senturk (2018); Gökçek, Güneş and Gençtürk (2013); and Erdamar, Demirkan, Saraçoğlu and Alpan (2017) found that in-service teachers' technology self-efficacy is at a medium level while Ardıç and Çiftçi (2019) and Pan and Franklin (2011) found it is at a low level. 21st century education requires technology integrated classrooms and teachers with technology proficiency. As the most of the literature and this study reveal, teachers of today are proficient technology users, which means second-order barriers that Ertmer (1999) introduced have widely been eliminated. However, technology is still not totally incorporated into education. Thus, it is now time to focus on the elimination of first-order (Ertmer, 1999) and third-order (Tsai & Chai, 2012) barriers to fulfil the requirements of 21st century learning. We believe it is high time education policy makers took action in this regard. More in-service teacher training programs should be

organized so as to improve digital competence and design thinking skills, and curricula should be redesigned in a way to leave more space for technology integration.

Table 14.

Bonferroni (Post-hoc) test results indicating the relations between the time ranges

					95% Confidence Interval	
(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0-3 hours	3-6 hours	-.06710	.09652	1.000	-.3236	.1894
	6-9 hours	-.34298*	.11333	.016	-.6442	-.0418
	9+ hours	-.48108*	.14786	.008	-.8741	-.0881
3-6 hours	0-3 hours	.06710	.09652	1.000	-.1894	.3236
	6-9 hours	-.27588*	.09868	.033	-.5382	-.0136
	9+ hours	-.41398*	.13695	.016	-.7780	-.0500
6-9 hours	0-3 hours	.34298*	.11333	.016	.0418	.6442
	3-6 hours	.27588*	.09868	.033	.0136	.5382
	9+ hours	-.13810	.14928	1.000	-.5349	.2587
9+ hours	0-3 hours	.48108*	.14786	.008	.0881	.8741
	3-6 hours	.41398*	.13695	.016	.0500	.7780
	6-9 hours	.13810	.14928	1.000	-.2587	.5349

*. The mean difference is significant at the 0.05 level.

The first research question of the present study attempts to find out if there is a significant relationship between sex and perceived technology proficiency of Turkish teachers of English. The results indicate that male and female teachers are equally competent in using technology, and sex is not a factor affecting technology competence. Likewise, Akturk and Ozturk (2019), Arslan (2015), Gökçek et al. (2013), Kahraman and Yılmaz (2018), Onivehu, Ohawuiro and Oyeniran (2017), and Özer (2018) found that in-service teachers' sex and technology competence are not significantly related. Yielding contradicting results, Ardıç and Çiftçi (2019), Bas and Senturk (2018), Kaarakainen, Kivinen and Vainio (2018), Şimşek and Yazar (2017), and Teo, Fan and Du (2015) found that male teachers outperform their female counterparts; and Anderson and Maninger (2007), Basargekar and Singhavi (2017), Buabeng-Andoh (2019) and Çakır and Oktay (2013) found vice versa. According to Imhof, Vollmeyer and Beierlein (2007), the difference in favor of males could be explained by the fact that males make more use of electronic devices for personal or non-work related purposes. However, as the present study suggests, this gap seems to be bridged. Technology has become ingrained into every part of our lives and access to the internet and electronic devices has become widely available. Especially in the time of COVID-19 pandemic, people have become too dependent on their electronic devices more than ever to work, receive education, remain socialized, and run their errands etc. Under such circumstances, being a competent user of technology has become unavoidable regardless of one's sex. Therefore, variables other than gender/sex had better be examined in similar future studies.

The second research question tried to assess the relationship between age and perceived technology proficiency of Turkish teachers of English. The findings show that the relationship is not meaningful. Likewise, Cigdem and Topcu (2015) and Martin, Reeves, Smith and Walker (2016) state that teachers' ICT proficiency does not vary based on their age. However, Basargekar and Singhavi (2017), Kazu and Erten (2014), Luik, Taimalu and Suviste (2018) and Scherer, Siddiq and Teo (2015) found that the older a teacher is, the less competent he/she is in technology use. Indicating otherwise, the findings of the present study could be explained by the fact that everyone, no matter how old they are, is excessively exposed to the internet and electronic devices in recent years, especially during the COVID-19, and this has made everyone acquire ICT skills.

The third research question aimed to discover the relationship between the level Turkish teachers of English teach and their perceived technology proficiency. Kay (2006) argues that attitudes towards integrating technology into education vary according to teachers' grade level, and this aspect is not given enough

emphasis in the literature. Among the limited number of studies considering this aspect, Balta and Duran (2015) and Morales, Knezek and Christensen (2008) state that what level a teacher teach affects his/her technology competence. On the other hand, Çakır and Oktay (2013), Hsu and Kuan (2013), and Şimşek and Yazar (2017) reveal just the opposite. This study shares the same view with the latter group of studies, in other words, perceived technology proficiency of Turkish teachers of English and what level they teach are not significantly related. The findings demonstrate that in-service Turkish teachers of English are able to establish technology integrated classroom settings and to meet their students' 21st century learning needs at all grades. This could be because teachers are teaching the most digital native generation of all times. In other words, their audience can make use of electronic devices really well no matter if they study at primary school or university. It seems teachers may not hesitate to integrate technology into their classes if they believe their students are competent users of technology no matter how old they are.

The fourth research question discovered a meaningful relationship between whether Turkish teachers of English teach at a state or a private institution and their perceived technology proficiency. Among the limited number of studies available in the literature, Basargekar and Singhavi (2017) and Aydin, Gürol and Vanderlinde (2016) found that teachers working at a private institution are better users of technology compared to their counterparts working at a state institution. This study reached the same conclusion. This could be attributed to the fact that private schools possess more advanced technological infrastructure and offer more professional development opportunities (İlgar, 2014). This finding is of importance since it reveals the inequality of opportunities between both types of schools and between millions of students. Major responsibilities fall upon the government, authorities, policymakers, institutions and organizations to eliminate this inequality, which corresponds to first-order barriers Ertmer (1999) introduced.

The fifth research question found a non-significant relationship between whether how long Turkish teachers of English have been teaching and their perceived technology proficiency. This finding conflicts with most of the literature. Akturk and Ozturk (2019), Bas and Senturk (2018), Christensen and Knezek (2016), Şimşek and Yazar (2017), and Uerz, Volman and Kral (2018) state that teachers lacking experience are more technology competent than experienced teachers. Holding the same view as the present study, Yang and Huang (2008) state that technology proficiency of experienced teachers is increasing owing to in-service training programs. As this finding reveals, it can be said that these programs have achieved their goals. Besides, it can be argued that teachers have been able to compensate for the lack of technology competence that may result from being digital immigrants thanks to their experience.

The last research question discovered a positive relationship between how much time Turkish teachers of English spend in technological environments and their perceived technology proficiency. Bandura (1993) posits that experience is very effective in increasing self-efficacy. In the same vein, the more time they spend in technological environments, the more proficient they are in technology use. This finding is in line with most of the literature (Bozdoğan & Özen, 2014; Durak & Sarıtepeci, 2017; Kahraman & Yılmaz, 2018; Turel, 2014). However, there are some studies with contradicting findings (So, Choi, Lim, & Xiong, 2012; So & Kim, 2009), which argue that using electronic devices for personal purposes does not necessarily have teachers gain experience in using technology for educational purposes. This study shows otherwise. In other words, spending time in technological environments for non-educational purposes also improves in-service teachers' technology proficiency in using technology for educational purposes. We argue that in-service teachers ought to be exposed to technological environments more, which could be achieved by introducing them to useful digital tools, applications, activities, games etc. that they can use in class, encouraging them to carry out their basic tasks such as lesson planning, material development, keeping track of their students' progress etc. on electronic devices and to get in touch and exchange ideas with other teachers through social media groups.

6. Limitations and Suggestions for Future Research

The data were collected during the 2020-2021 academic year, in other words, during the COVID-19 pandemic. That is why the researchers could only collect data via electronic means, and teachers who did not have internet connection or a computer or a smartphone were left out of the scope of the study to some

extent. This also limited the number of participants. To avert this problem, the researcher got in touch with such teachers and collected their answers to the questionnaire via other ways.

In addition, collecting qualitative data would have helped us present a clearer picture of the current status of technology integration.

In future studies, in-service interventions could be designed to be performed during mid-term and/or summer breaks. They should aim to make in-service teachers familiar with new educational technologies, to show them how to make use of them in class and improve their teaching.

We found a non-significant relationship between gender and technology competence, which is not surprising since every individual, regardless of their gender, has become competent user. Besides, it is inevitable that their technology competence will increase even more in time because everything is going online and everyone needs to keep up. Therefore, we believe variables other than gender should be investigated so as to come up with significant findings in related studies.

Our study discovered a non-significant relationship between age and perceived technology proficiency unlike most of the literature, which states higher age means lower technology competence. Therefore, more research is required to reinforce our finding.

We found a significant difference between the perceived technology proficiency of teachers working at a private institution and that of those working at a state institution in favor of the former. Future research may focus on how to eliminate this inequality affecting millions of people.

Our study found that the more time in-service Turkish teachers of English spend in technological environments, the better their perceived technology proficiency becomes. Therefore, interventions and/or in-service training programs aiming to increase their exposure to technological environments in a meaningful way could be designed.

Finally, the scope of this study can be extended by analyzing technology proficiency of teachers of other foreign languages.

7. Conclusion

This study has revealed that perceived technology proficiency of Turkish teachers of English is high. In other words, second-order barriers (Ertmer, 1999) seem to be eliminated. However, technology is not integrated into education as much as desired. Therefore, it is now time to focus on and eliminate first-order (Ertmer, 1999) and third-order barriers (Tsai & Chai, 2012) so as to establish technology-integrated 21st century classrooms.

Being a digital native or digitally competent does not necessarily mean that teachers can integrate technology into their classes easily. They should also take pedagogical and psychological aspects into account while designing their classes. Teacher training curricula must be revised in a way to melt each component of TPACK in the same pot.

Most of the literature used to hold that males outperform females in technology competence. However, some recent studies and this study indicate that this is not the case anymore.

The present study suggests that digital immigrant teachers are doing fine in improving their ICT skills partly thanks to in-service training opportunities partly to their own efforts. To further this improvement, more in-service training should be provided.

This study and some studies reveal that teachers working at a private institution have higher technology proficiency compared to their counterparts working at a state institution, which creates inequalities of opportunities between teachers and between students. Affecting millions of people, this problem should be handled by authorities as soon as possible.

The 21st century has changed students' learning needs and the traditional teaching practices. Technology has become an indispensable part of today's classrooms as well as of our lives. The present study aims to find out how Turkish teachers of English are doing in this process. It is believed that this study delivers some useful data that could be beneficial for future researchers in the elimination of barriers to technology integration, which a necessary step towards 21st century learning.

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