The Relationship between TPACK and Self-Efficacy of the English Teachers of Gifted Students in Science and Art Centres: A Sample of Türkiye

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Modern technology has been incorporated into all the aspects of daily life. The relevant changes are transforming our routines and are being integrated into our lives at varied speeds. This transition is also having an impact on teaching and learning practices. To integrate the aforementioned changes into their everyday practices, substantial effort has been invested by the participants within these contexts, namely, the students and their teachers. The necessity for proficiency in technology tools and applications, coupled with the exploration of whether there exists any correlation between technological pedagogical content knowledge (TPACK) levels and self-efficacy levels, stands as a phenomenon that warrants examination in literature. Although previous studies succeeded to emerge TPACK level of English language teachers from different backgrounds, it was aimed to fill the gap for those (124) of gifted students through the current study. A case study was used; also, TPACK-EFL survey and the English Self-Efficacy Belief Scale were preferred as the instruments. The results indicated that the TPACK level of English language teachers of gifted students was quietly high, and they were aware of instructional strategies, student engagement, and classroom management from the perspective of self-efficacy within four language skills such as; reading, writing, listening and speaking.

Introduction

To cope with global difficulties, people have adapted to the circumstances present then throughout history. Educational systems must also meet the fundamental requirements of the new generation of technology. Innovation in science and technology, the ability to effectively design and utilize a certain area of technology, which is expressed in a wide range of experiences and learning in research, improvement, and application in production (Fai & von Tunzelmann, 2001), -now has a crucial impact. It also facilitates learners' process of acquiring content knowledge and using communication skills (Dousay & Weible, 2019). Therefore, educators and teachers must find a solution for this new situation, which is highly related to the adaptation of technological developments in teaching/learning environments. Technology has allowed classroom applications to change dramatically in recent years. Teaching in a modern classroom is different from what it used to be (Seifert & Sutton, 2009), so members of the educational field must interpret and implement technological changes in the learning

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environment. As posited by Prensky (2001), contemporary youth are commonly characterized as digital natives, denoting their upbringing in the era of technology. These individuals become acquainted with technological advancements early in their lives, perceiving them as integral components of their identities. However, it is crucial to note that the categorization of a specific segment of the population using terms like "digital natives," "Generation Z," or "digital immigrants" has faced criticism for its potential implications of discrimination and alienation (Stoergers, 2009). Additionally, scholars such as Bayne and Ross (2011) have highlighted the risk of these terms leading to the commodification of the labeled group through marketing campaigns.

Turkish digital natives are among those who can use blogs and wikis, communicate, and use collaborative networks (Atal & Usluel, 2011; Somyürek & Karabulut Coşkun, 2013). Despite this, Livingstone et al, (2011) found that they use digital skills at the lowest level. Since the definition of this word includes the late 1980s transitioning into the early 1990s, when people were able to find a computer and internet at home, the digital natives are currently in the classrooms as actors of education, thereby becoming teachers and learners (Black, 2010). Therefore, the significance of employing technology in language learning and teaching cannot be overstated, making digital competence a noteworthy phenomenon for educators. Consequently, the question arises: What precisely is digital competence?

Ferrari (2012) defines digital competence as a skill to utilize information and communication technology (ICT) to manage information, to produce content, to communicate, and to solve problems. However, just because a teacher uses technology in the classroom does not imply that they are proficient on it. Since they must, now, address their students in order to impart knowledge, it is undoubtedly much more difficult (Krumsvik, 2008). But can these schools or faculties raise instructors of this calibre? Or can the students receive a lesson that incorporates technology?

The majority of future teachers lack the skills necessary to use technology effectively (Tondeur et al., 2016). In addition, teachers themselves have expressed concerns about the ineffective facilitation of technology in the classrooms (Demir et al., 2011). As a result, the technological education that faculties or teaching departments provide is a significant factor influencing classroom practices (Chen, 2010). At this point, additional considerations come to the forefront, prompting inquiries into the integration of technology within the pedagogical process, its assessment methodologies, and the extent to which it constitutes a component of the curriculum.

Being labelled as a digital native does not inherently translate to the seamless integration of technology into the teaching process. Despite belonging to the majority of users in this technological era, novice educators have reported a deficiency in competence when it comes to incorporating technology into their instructional practices (Polly et al., 2010). Especially for digital native teachers (who were born in 80s and 90s when the internet connection and computers entered our lives), keeping up with current technology and integrating it into classrooms in parallel with pedagogy and content are also a subject for the field.

Teachers have a key role in classes that include technology (Christensen & Knezek, 2018), stating that teachers should have access to digital technologies and be able to instruct students regarding how to utilize technology successfully. Technology knowledge (TK), pedagogy knowledge (PK) and content knowledge (CK) are the three primary groups that teachers must be familiar with. When analysing the technological, pedagogical, and content knowledge (TPACK) categories, PK refers to general knowledge that includes pedagogical education.

Second, pedagogical content knowledge (PCK) refers to selecting appropriate subject-specific teaching philosophies, techniques, and strategies as well as successfully organizing the content for effective instruction. Third, technological pedagogical knowledge (TPK) stands for the appearance, elements, and vulnerability of various technologies utilized in education, as well as the selection of an appropriate pedagogical model that may be applied with each appropriate technology during the method of instruction. Koehler and Mishra (2006) defined the structures above and continued to declare the technological pedagogical content knowledge (TPACK), and the graphic below illustrates the structure of TPACK. Fourth, CK stands for an understanding realm that mostly consists of linguistic components, language skills, and cultural components. Fifth, TK suggests technological aptitude. The field of expertise that examines the relation between content and technology is defined as technological content knowledge (TCK), finally. However, merging the framework's components creates PCK, TCK, and TPACK (Koehler & Mishra, 2005).
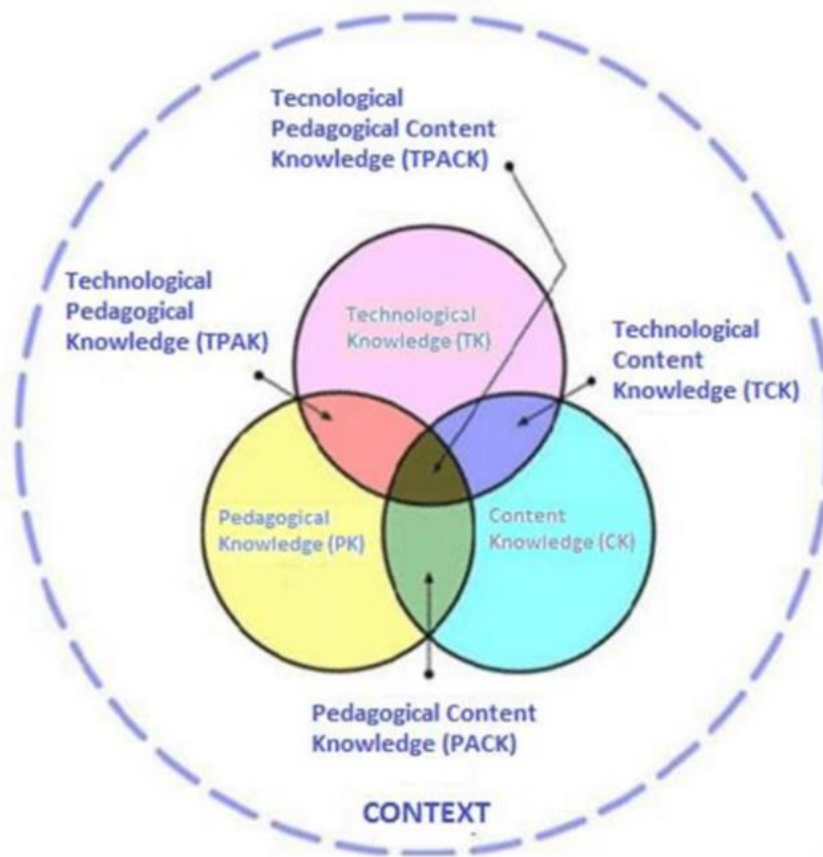

Figure 1. The TPACK Framework by Mishra & Koehler (2005)

Particular attention should be paid to TPACK when talking about teachers' digital proficiency. The phrase was first introduced by Koehler and Mishra (2005) under the abbreviation TPCK, which stands for Technological Pedagogical Content Knowledge. The term was altered to TPACK, and suggests that technology, pedagogy, and content should be treated holistically (Thompson & Mishra, 2007). It posits that recognizing the interplay among technology, pedagogy, and content is imperative for the effective integration of technology into educational settings (Koehler & Mishra, 2005). Despite an increasing focus on exploring the use of technology for language acquisition and enhancement, there remains a scarcity of studies examining the technological pedagogical content knowledge of foreign/second language teachers working with gifted students in an English as a Foreign Language (EFL) context. As

a result, there's an absence in the existing knowledge regarding how gifted students' EFL teachers view their TPACK skills. The studies mainly concentrated on topics like the cornerstone of an influential learning setting, the duties of educators with regard to technological advancement, the impact of information and communication technologies (ICT), teachers' abilities in terms of CK, PK, and TK, and the effect of implementing cutting-edge technology on successful EFL classes. However, there is a connection between EFL teachers' TPACK abilities and how they view technology. As Nazari et al. (2019) showed that the seasoned educators scored significantly better on the subscales measuring pedagogical expertise and pedagogical subject knowledge. In contrast, inexperienced teachers scored much higher when taking into account their TPACK technology knowledge, technical pedagogical knowledge, and technological content knowledge in the same study of Nazari (et. al., 2019).

In some instances, it is imperative for educators to possess a profound understanding of the significance of technology and its integration into the instructional environment. As exemplified by research conducted by Aniq and Drajati (2019), a substantial number of EFL teachers indicated a higher level of expertise in the domains of CK, PK, and PCK compared to TK, TPK, TCK, and TPACK. In addition to this, technology gaps can be filled through various educational activities. In Cahyono et al.'s (2016) study, the results indicated substantial support provided to teachers through a TPACK-focused course on teaching methods and techniques. Consequently, the teachers demonstrated proficient development in crafting instructional strategies and implementing teaching practices within the framework of TPACK.

Certain studies delve into individual differences, including gender, as demonstrated in the work of Solak and Çakır (2014). The outcomes of the research indicate that males exhibited a higher proficiency in technological knowledge than females, whereas females outperformed males in terms of pedagogical expertise. Concerning the association between participants' academic achievement and the TPACK scale, there was not any significant difference between the two variables. On the other hand, Taopan et al. (2020) found out that integrating technology into English instruction is highly challenging. The teacher must contend with issues including internet access, IT literacy, and a dearth of technology-based lesson plans. In addition, integrating technology within educational settings can make learning more enjoyable and flexible, inspire students and teachers to become better people, and provide numerous chances for creating multimodal products (Bates, 2005). This discovery is a valuable contribution regarding the incorporation of technology in EFL studies. The institution or other stakeholders should be aware of the necessity to enhance and facilitate teaching and learning within the educational environment with adequate facilities, according to this finding.

When examining the educational experiences designed to cultivate proficient and knowledgeable educators adept at using technology for the creation of engaging and effective classroom environments, researchers have identified the utility of both knowledge and beliefs in comprehending the underlying processes. It has been observed that the beliefs and attitudes held by in-service teachers regarding computers and technology not only elucidate but also predict the utilization of technology in the classroom (Vannatta & Fordham, 2004). Similar assessments of beliefs and attitudes have been employed as indicators of the effectiveness of teacher preparation programs for technology integration (Hansen, Donovan, & Fitts, 2009). However, it is crucial to recognize that while beliefs and attitudes play a significant role, they may not comprehensively explain all aspects contributing to the effective integration of technology in teaching and learning.

As the realm of educators with elevated levels of TPACK has been mentioned, it is imperative to investigate its correlation with teacher self-efficacy. For example, understanding how teachers with high/low TPACK levels perceive and navigate their own self-efficacy is of paramount importance. This relation between TPACK and self-efficacy unveils a comprehensive understanding of how technological proficiency in teaching intersects with educators' confidence in their instructional abilities. In the subsequent sections, this study will delve into the intricate relationship between TPACK and teacher self-efficacy, shedding light on the nuanced dynamics that contribute to effective teaching practices.

Bandura (1997) defines self-efficacy that (rather than what people are truly capable of achieving) their opinions about their abilities—what he called self-efficacy beliefs—can frequently indicate how people will behave because these opinions of themselves influence what people do with the expertise and abilities they possess. Recently, Bandura (1997) has provided additional context for self-efficacy by placing it within a framework of individual and group agency that functions in conjunction with other socio-cognitive elements to govern human achievement and well-being. (Bandura, 1997).

When students start learning a new language, they evaluate their own abilities. If they begin with a low perception, it will affect their success. Some students, when perceiving their inadequacies, may set aside their learning tasks. Their perception of inadequacy also increases their anxiety levels, affecting their achievements (Aydın, 2001).

Multiple dimensions of self-efficacy beliefs may influence a teacher's attitudes and behaviours about the use of technology in the classroom when it comes to teaching and learning. In his study, Albion (2001) discovered a favourable correlation between self-efficacy perceptions about computer use and the quantity of time devoted employing a computer. Teacher education programs should be designed and instructed with approaches which develop the confidence of students in their ability of successful computer use, according to Albion's recommendation, as a way to encourage the efficient use of technology in the technological classrooms. According to the previous studies, teachers' abilities to design classrooms that make meaningful use of technology are influenced by their own self-efficacy views on computer use and technology integration, but these ideas partially govern how they organize learning processes in their classroom, according to Bandura (1997). Therefore, while searching teachers for meaningful and successful technology integration in education and learning contexts, views about one's capacity for applying technology in a classroom setting should be taken into account only to a limited extent.

When it comes to studies related to language teaching and self-efficacy, it has been observed that more emphasis has been placed on the English self-efficacy perception of prospective English teachers (Büyükduman, 2006). The previous studies focused on digital learning strategies with self-efficacy (such as Siew & Wong, 2005; Wang, 2004) or success (such as Shmais, 2003; Woodrow, 2006). Among the studies in Turkey, the participants are almost the high school students or the pre-service English teachers (Duman, 2007), as well as the translator candidates (Vural, 2023). Shyness and low self-efficacy are two reasons why Turkish university students struggle with communication (Vural, 2020). Yılmaz (2010) intends to investigate the connections between proficiency, gender, preferred linguistic methods, and self-efficacy views of EFL students. The results showed that there are significant findings on the usage of strategies by proficient and less proficient learners, as well as disparities between male and female learners. Furthermore, the efficient learners' usage of strategies may be evaluated as part of strategy education, which would enable less skilled learners to gain proficiency in English by

using the successful techniques used by the competent learners from the perspective of self-efficacy. Building on the findings of Bozdoğan and Özen (2014), which suggest that ICT self-efficacy is influenced by factors such as expertise, proficiency, technical challenges, and confidence, as well as the significant roles played by experience, trust, and perceptions of computers, the present study sought to explore the correlation between TPACK and self-efficacy belief levels. To achieve this, two questionnaires were administered to English teachers of gifted students in Science and Art Centres (SACs) which will be explained in instruments section. Even if a teacher has a sophisticated understanding of how to integrate technology, it becomes inconsequential if they lack the self-efficacy, or the belief in their ability, to effectively apply this knowledge in the classroom. In essence, the effective implementation of TPACK is contingent not only on the knowledge itself but also on the teacher's confidence and belief in their capacity to use that knowledge in the classrooms.

Research Questions
(1) What is the TPACK level of the gifted students' English language teachers?
(2) What is the self-efficacy level of the gifted students' English language teachers?
(3) Is there any difference among the variables, such as gender, age, and experience, from the perspective of TPACK and self-efficacy of gifted students' English language teachers?
(4) Is there any relationship between the TPACK and self-efficacy results of the participants?

Methodology
The methodology section includes the research design, participants, instruments and analysis.

Research Design
In this study, the general survey method, one of the quantitative research techniques, was applied (Büyüköztürk et al., 2012). This method was selected because it allows for the analysis of traits, beliefs, and mindsets within a specific group of people (Hocaoğlu and Akkuş-Baysal, 2019). The research design of this study is rooted in a quantitative approach, aiming to provide a systematic and numerical analysis of the relationships between specific variables. The choice of a quantitative method is driven by the nature of the research questions, which seek to establish measurable patterns and associations. Quantitative research allows for the collection of numerical data, facilitating statistical analyses to identify trends and patterns objectively. The decision to employ this method is based on its ability to generate empirical evidence and statistical generalizability. In this study, the variables under investigation will be clearly defined and operationalized, allowing for precise measurement and analysis. The quantitative approach is selected for its capacity to yield statistically significant findings, contributing to a more comprehensive understanding of the phenomena under scrutiny. Therefore, the data were analyzed regarding the relationship among the variables such as gender, age, and experience from the perspective of TPACK and self-efficacy levels.

The Participants
The participants of the study consist of English teachers who were working at different SACs in Turkey. The reason of choosing SAC English teachers for this study is to find them as motivated sufficiently by their specific characteristics, thoughts, and attitudes relevant to a particular student population or their involvement in a specialized role as part of a specific educational program. Additionally, their expertise or experience in a particular subject area is another a factor in alignment with the purpose of the study. To reach out to English teachers, a

WhatsApp group was utilized. A form containing information about the entire process and demographic data was shared with them, and work commenced with those who responded. Initially, surveys were conducted in the form of Google Forms, utilizing the email addresses of willing and volunteer teachers, to establish communication.

The total number of volunteer participants is 124. Information regarding participants' genders, age ranges, and experiences is provided below.

Table 1. Sampling Group Gender Distribution

Gender	Frequency	Percentage (%)
Female	83	66.94
Male	41	33.06
Total	124	100

As in Table 1, the number of female participants is 83 (66,94%) and male participants is 41 (33,06%). Information about age of the participant group is presented in Table 2.

Table 2. Sampling Group Age Distribution

Age	Frequency	Percentage (%)
20-25	10	8.06
25-30	12	9.68
30-35	22	17.74
35-40	31	25
40+	49	39.52

According to Table 2, regarding their age, the number of those in the 20-25 age range is 10 (8,06%), the 25-30 age range is 12 (9,68%), the 30-35 age range is 22 (17,74%), the 35-40 age range is 31 (25%) and 40-over is 49 (39,52%).

Table 3. Sampling Group Professional Experience Distribution

Experience	Frequency	Percentage (%)
1-5	10	8.06
5-10	15	12.10
10-15	20	16.13
15-20	13	10.48
20+	66	53.23

In Table 3, the number of years of experience between 1-5 years in the present study is 10 (8.06%), 5-10 years range is 15 (12.10%), 10-15 years range is 20 (16.13%), 15-20 years range is 13 (10.48%), and 20-over is 66 (53.23). As can be understood, the participants were, mostly experienced, mature, and female.

Instruments

The data were gathered using the TPACK-EFL Survey and English Self-Efficacy Belief Scale. This measurement tool was chosen to assess teachers' knowledge, skills, and self-efficacy in the areas focused on in the study, such as technology integration and English language teaching. Additionally, it was used in similar studies before, with their reliability and validity already established, explaining the rationale for its choice. To specifically look into the TPACK-EFL knowledge of EFL teachers of gifted students about the implementation of digital tools in creating language teaching materials, Baser et al. (2016)'s TPACK-EFL Survey was used. The TPACK-EFL survey provides teacher educators with an accurate and trustworthy tool that tackles the particular pedagogical and technology techniques favored in EFL

situations. 39 items total—9 TK, 5 CK, 6 PK, 5 PCK, 3 TCK, 7 TPK, and 4 TPACK, were included in the survey. First, the TPACK-EFL Survey was used to gauge the proficiency of the teachers. The internal consistency reliability coefficients (measured by Cronbach's alphas) within each construct were found to be adequate (TK .89, CK .88, PK .92, PCK .91, TCK .81, TPK .91, TPACK .86); as per Fraenkel and Wallen (2008), values exceeding .70 are considered acceptable.

As for the other instrument, English self-efficacy belief scale by Yanar & Bümen (2012), was chosen. The choice to use the English Self-Efficacy Belief Scale by Yanar & Bümen (2012) alongside the TPACK instrument in this study is based on the intention to capture a comprehensive understanding of teachers' capabilities and confidence in English language teaching. While TPACK assesses technological pedagogical content knowledge, the self-efficacy belief scale may provide insights into teachers' confidence levels specifically related to their proficiency and effectiveness in teaching English. This combination of instruments allows for a more holistic evaluation of teachers' preparedness and belief in their abilities to integrate technology effectively into English language teaching. Following a study of the pertinent literature principally, 64 items indicating reading, writing, listening, and speaking proficiency were created by Yanar and Bümen (2012). A pilot form with 47 elements was created after the prepared items were twice presented to experts. Following the pilot application of the draft scale, the data underwent exploratory factor analysis (EFA), which revealed that the items with eigenvalues above 1.00 were categorized into four dimensions. A pilot application form with 34 items was created after thirteen items from the scale that did not load on any dimension or loaded on multiple dimensions in the exploratory factor analysis were eliminated. For the final version, 34 elements on the scale have factor loadings ranging from 0.42 to 0.69 (Yanar & Bümen, 2012). The scale's reliability research revealed that the Cronbach's Alpha coefficient was 0.97. According to Yanar and Bümen (2012), pp. 97–103, the reading, writing, listening, and speaking sub-dimensions all had Cronbach's Alpha coefficients of 0.92 for reading, 0.88 for writing, 0.93 for listening, and 0.92 for speaking. The English Self-Efficacy Belief Scale was not subjected to factor analysis because it already had established validity and reliability, but its reliability was evaluated and found to be high at 0.94. The reading sub-dimension has a Cronbach's Alpha coefficient of 0.84, the writing sub-dimension of 0.88, the listening sub-dimension of 0.90, and the speaking sub-dimension of 0.91.

For both of the scales, the items were measured on five-point Likert scale with points by using phrases ranging from strongly disagree to strongly agree. The perceived level of self-efficacy increased in tandem with the scores obtained from the scale. The interpretation of the mean values was as follows: average values falling between 1.00 and 5.00 were categorized as follows: "strongly agree" (4.21–5.00), "agree" (3.41–4.20), "undecided" (2.61–3.40), "disagree" (1.81–2.60), and "strongly disagree" (1.00–1.80). Low self-efficacy perception was defined for average ratings between 1.00 and 2.60, moderate self-efficacy perception for average ratings between 2.61 and 3.40, and high self-efficacy perception for average ratings between 3.41 and 5.00.

Data Analysis

The SPSS 20.0 package was used to analyse the responses. The normality of the distribution of the scores acquired from the complete range, along with its individual components or aspects are investigated in order to choose the suitable test in the data analysis. After the data underwent analysis, it was established that the data followed a normal distribution because the skewness-kurtosis coefficient fell between +2.0 and -2.0 and the significance value

of the Kolmogorov-Smirnov test was less than 0.05. As such, parametric testing was used in this situation. An independent sample t-test was used to examine the link between the self-efficacy views of English language teachers from SACs. ANOVA was used due to the unequal number of items in the surveys defined by the teachers' gender, age, and experience variables.

Ethics

Author declared that the study was approved by the Ethics Committee in Zonguldak Bülent Ecevit University, on 28,03,2023 with approval code: 283221.

Results

For the first research question, the TPACK levels of the gifted students' English teachers are demonstrated in Table 4.

Table 4. TPACK Level of English Teachers

Items	N	Min.	Max.	$\bar{x}$	Std. Deviation
TK (technological knowledge)	124	3.54	4.52	4,01	,91
CK (content knowledge)	124	4.66	4.80	4.71	.47
PK (pedagogical knowledge)	124	3.92	4.70	4.38	.66
PCK (pedagogical content knowledge)	124	4.26	4.59	4.50	.54
TCK (technological content knowledge)	124	3.46	4.18	3.90	.95
TPK (technological pedagogical knowledge)	124	3.54	4.28	3.97	.99
TPACK (technological pedagogical content knowledge)	124	3.94	4.09	4.02	.98

As evident from Table 4, the participants appeared to be in agreement with the items related to TK ($\bar{x}$=4.01). Specifically, the participants demonstrated that they can use basic technological terms ($\bar{x}$=4.29), computer peripherals ($\bar{x}$=4.52), digital classroom equipment ($\bar{x}$=4.30), and office programs ($\bar{x}$=4.25). The least capability of TK was chosen as computer settings ($\bar{x}$=3.54) by the gifted students' teachers.

Also, the participants expressed a high level of agreement with the statements in this area in terms of content knowledge (CK) ($\bar{x}$=4.71). More detailed, the majority of participants stated that they are capable of conveying their thoughts and emotions through written English ($\bar{x}$=4.67), can read written texts in English with the correct pronunciation ($\bar{x}$=4.69), comprehend written texts in English ($\bar{x}$=4.66), and the highest level of this agreement is that they can effortlessly comprehend the speech of a monolingual speaker of English ($\bar{x}$=4.72). The statistics for pedagogical knowledge showed that the participants "agreed" on the topics surrounding their own assessments of their educational competence. In particular, most of the participants believed that they can assist in students' learning while considering their varying distinctions ($\bar{x}$=4.70), can reflect the experiences that they gained from professional development programs to my teaching process ($\bar{x}$=4.5). In addition, they also thought that they can be in relation with parents, students, and teachers, to enhance students' learning ($\bar{x}$=4.46) in PK.

Similarly, pedagogical content knowledge (PCK) ($\bar{x}$=4.50) has gained consensus among the participants. Particularly, participants can be said that they can control a classroom learning environment ($\bar{x}$=4.58) and evaluate students' learning processes ($\bar{x}$=4.57). Additionally, it can be claimed that the participants may adjust a lesson plan to the language proficiency levels of the students ($\bar{x}$=4.59) and utilize suitable teaching techniques that assist students in growing

their language abilities ($\bar{x}$=4.52). Plus, the participants settle on the items in this area as seen by the mean score for TCK, which is 3.90. The majority of the participants, in particular, agreed that employing technology (for example, online conferencing and discussion boards) to add value remotely to communities of different languages can be advantageous ($\bar{x}$=4.18). More detailed, the item "*I can use collaboration tools to work collaboratively with foreign persons*" has ($\bar{x}$=3.52) the lowest level.

The participants affirmed that they are proficient enough in technical pedagogical knowledge (TPK) ($\bar{x}$=3.97). The mean scores demonstrated that teachers are able to choose when technology might be helpful in their instruction of particular English curricular standards ($\bar{x}$=4.88), control the learning atmosphere in the classroom while employing technology in the class ($\bar{x}$=4.28), and use multimedia such as videos and webpages to promote the learning of languages by students ($\bar{x}$=4.12). The participants almost agreed when it came to self-evaluation of their TPACK. Specially, most of the participants confirmed that they support students as they promote their autonomous linguistic abilities using technology ($\bar{x}$=4.09), and they enable their professional growth by employing technological assets and instruments to continuously enhance the language teaching process ($\bar{x}$=4.04). For answering research question 2, the data are presented in Table 5.

Table 5. Self-Efficacy Level of English Teachers

Items	N	Min.	Max.	$\bar{x}$	Std. Deviation
Reading	124	4.10	4.85	4.52	.47
Writing	124	4.35	4.92	4.67	.44
Listening	124	3.73	4.25	3.98	.98
Speaking	124	3.92	4.06	4.02	.90

According to Table 5, when the total arithmetic mean regarding English reading self-efficacy belief is examined, it becomes evident that teachers articulate their perspectives at the "strongly agree" level ($\bar{x}$=4.52). This result suggests that students likely possess a quietly high level of self-efficacy in English reading. Similarly, when the total arithmetic mean regarding self-efficacy belief in the writing sub-dimension of English is examined, it can be observed that teachers expressed their views at the "strongly agree" level ($\bar{x}$=4.67). Based on this result, it can be said that teachers have a high level of self-efficacy belief in writing skills as well. On the other hand, it is observed that the average level of listening ($\bar{x}$=3.98) and speaking ($\bar{x}$=4.02) skills is still high but relatively lower compared to the other skills. Overall, the total mean score of four skills is $\bar{x}$=4.29 which clearly demonstrates that English teachers of gifted students had a relatively high degree of self-efficacy. To define the TPACK and self-efficacy level on behalf of the age variable, the data are demonstrated in Table 6.

Table 6. The Effect of TPACK and Self-Efficacy Levels on Age

	Age	N	$\bar{x}$	Std. D.	F	P
TPACK	20-25	10	4.05	.70		
	25-30	12	4.22	.41		
	30-35	22	4.11	.42		
	35-40	31	4.02	.49		
	40+	49	3.9	.51		
Total					1.683	.605
Self-efficacy	20-25	10	4.60	.90		
	25-30	12	4.32	.45		
	30-35	22	4.01	.88		
	35-40	31	3.9	.56		
Total	40+	49	3.92	.36		
					1.780	.195

In terms of age, TPACK and self-efficacy levels were analysed as shown in Table 6. The findings indicated an absence or lack of statistical difference for "age" variance of gifted students' language teachers regarding TPACK (f=1.683, p=0.605) and self-efficacy (f=1.780, p=0.195). From the gender aspect, the TPACK and self-efficacy level of the teachers are exhibited in Table 7.

Table 7. The Effect of TPACK and Self-Efficacy Levels on Gender

	Gender	N	$\bar{x}$	Std. D.	t	P
TPACK	Female	83	4	.92		
	Male	41	4.04	.77		
Total					1.722	.256
Self-efficacy	Famale	83	4.83	.56		
	Male	41	3.89	.32		
Total					1.022	.387

According to Table 7, the results showed that there was no significant difference in self-efficacy (t=1.022, p=0.387) and TPACK (t=1.72, p=0.256) among gifted students' language teachers based on gender. To show the data about the TPACK and self-efficacy level of the teachers' experiences, Table 8 gives the information.

Table 8. The Effect of TPACK and Self-Efficacy Levels on Experience

	Experience	N	$\bar{x}$	Std. D.	F	P
TPACK	1-5 y.	10	3.88	.56		
	5-10 y.	15	4.13	.55		
	10-15 y.	20	3.96	.58		
	15-20 y.	13	4.12	.52		
	20+ y.	66	4.09	.46		
Total					1.712	.159
Self-efficacy	1-5 y.	10	4.56	.45		
	5-10 y.	15	4.69	.56		
	10-15 y.	20	4.23	.52		
	15-20 y.	13	3.78	.48		
Total	20+ y.	66	3.96	.43		
					1.115	.185

According to ANOVA analysis, no significant difference was identified between the experience levels of language teachers instructing gifted students concerning TPACK (f=1.712, p=0.159) and self-efficacy (f=1.115, p=0.185).

In order to see the effect of self-efficacy beliefs of English teachers of gifted students, Spearman's Rho correlation analysis was conducted for each of the TPACK sub-categories.

Table 9. The Correlation between Self-Efficacy and Subcategories of TPACK Level of English Teachers

Sub-categories of TPACK	Self-Efficacy
TK	.262*
CK	.320
PK	.163*
PCK	.214
TCK	.367*
TPK	.298*
TPACK	.269*

* Correlation is significant at the .05 level

In the Table 9, regarding the Spearman rank-order correlation results; a statistically significant positive correlation was found between TK and self-efficacy (rs = .262, p < 0.05), PK and self-efficacy (rs = .32, p < 0.05), TCK and self-efficacy (rs = .367, p < 0.05), TPK and self-efficacy (rs = .298, p < 0.05), TPACK and self-efficacy (rs = .269, p < 0.05). a significance positive correlation was not found for the factors such as CK and self-efficacy (rs = .163, p < 0.05), and PCK and self-efficacy (rs = .32, p < 0.05).

Discussion and Conclusion

This research aimed to demonstrate the TPACK and self-efficacy levels among teachers of gifted students, as well as explore the correlation between TPACK levels and self-efficacy when utilizing technology. For this purpose, 124 EFL teachers of the gifted students participated to the study voluntarily. Regarding TPACK-EFL survey which includes 7 sub-factors: TK, CK, PK, PCK, TCK, TPK, TPACK; and *English Self-Efficacy Belief Scale* (Yanar & Bümen, 2012); the data were analysed quantitatively.

The findings showed that the level of TPACK of English teachers are significantly high as; TK items were found to be sufficient especially in some areas such as basic technological terms, computer peripherals, digital classroom equipment, and office programs. For the items concerning CK, it was determined that they possessed the ability to articulate their thoughts and emotions through written English, to exhibit correct pronunciation when reading English texts, to comprehend written English, and to understand the speech of native English speakers. In relation to the items of PK, the investigation uncovered that the participants had a sense of competence in supporting he students' learning, considering their diversities. They were found to be able to integrate the experiences gained from professional development programs into their teaching practices and to collaborate effectively with stakeholders to facilitate student learning. Regarding PCK items, they demonstrated proficiency in managing a classroom learning environment, evaluating students' learning duration, employing suitable teaching methods and techniques to enhance language skills, and adapting lesson plans according to students' language proficiency levels. As for TCK, it was evident that the participants excelled in utilizing technology, such as web conferencing and discussion forums, to actively engage with multilingual communities from a distance. Lastly, in terms of TPK items, the participants displayed their ability to incorporate websites and movies that use multimedia to promote language learning for students, to make educated choices on how to use ICT to improve their instruction of particular English instructional criteria, and skilfully to handle the learning environment within the classroom when employing technology in their teaching. Within the extent of TPACK, the participants demonstrated the same line as the sub-dimensions such as promoting students as they use technology, utilizing technical instruments and materials to

continually improve the language education process by assisting their autonomous language learning as well as their professional growth. As stated in the previous studies (Çam, 2020; Kozikoğlu & Babacan, 2019; Özbek, 2014; Öztürk, 2017; Türker, 2020), TPACK level of the English teachers of gifted students was revealed to be significantly high in general. This situation might suggest that high TPACK levels could enable teachers to utilize their knowledge more effectively. According to research, it may be challenging to activate teachers' knowledge and push them above their current understanding when they have a relatively low level of TPACK (McDougall, 2008). For example, in-service training that includes TPACK knowledge and the ability how to use it effectively, is required for leveraging future English teachers' TPACK resources. In the majority of prior studies (Venkatesh, Morris & Ackerman, 2000; Lin, Been-Lirn, Li, Wang, & Tsai, 2013; Chai, Koh, & Tsai; 2013) it was found that the males functioned better than females in terms of technology proficiency. In the study of Gómez-Trigueros and Yáñez de Aldecoa (2021), the findings indicated that while related to the teaching assignment, female participants perceive their digital teaching competency much lower than males do, and they are also less inclined to use technologies. According to Lin et al. (2013), unlike male teachers, female teachers are more confident in their pedagogical knowledge but less in technological knowledge. The results of this study also support the findings regarding gender differences mentioned in previous studies.

According to related investigations in literature, short-term or long-term experiences may be crucial for development efficacy of a teacher (Çakır & Alıcı, 2009). According to Bandura (1982), probably, the most important component of efficacy information is experience with mastery. The evaluation of an individual's alleged self-efficacy involves determining how successfully they can carry out the steps necessary for coping with probable circumstances. Self-efficacy beliefs are difficult to alter after they have been formed (Tschannen-Moran & Woolfolk Hoy, 2001), however, the years of experience of each practitioner showed nonlinear connections, rising from early to mid-career and then declining thereafter from the perspective of self-efficacy and experience (Klassen & Chiu, 2010). Yet, it is important to highlight that no clear-cut conclusion has been drawn regarding the relationship between experience and self-efficacy. In terms of this present study, it is evident that English teachers exhibited a high level of self-efficacy, regardless of whether they had 1 year or 20 years of experience. Moreover, they were more likely to have mastery experiences in SACs.

From the self-efficacy scale, the findings suggested that teachers exhibit fairly high level of self-efficacy belief in the writing and reading of English (Eslami, & Fatahi, 2008; Lavelle, 2006), while their self-efficacy beliefs in listening and speaking are at a comparatively lower level than the other two skills as mentioned in the study of Chen, (2007). Similar results supporting this study have been obtained in some previous research. In a study conducted by Güç (2019) on students learning English, it was mentioned that participants had self-efficacy at its maximum degree perception in writing skills, while their self-efficacy in speaking skills was at the lowest level. Most participants felt inadequate in speaking English, but they expressed that knowing and applying writing rules gave them a sense of accomplishment. The English self-efficacy belief levels of gifted students' English teachers did not significantly differ across the sub-dimensions of reading, writing, listening, and speaking concerning gender, age, and experience variables. However, when arithmetic means are examined, it is evident that the averages of women are higher than those of men. The data obtained from the research align with some studies conducted in this field. Tuncer and Akmençe (2019) have stated that English self-efficacy beliefs related to the sub-skills of English course were higher in women than in men, especially in reading and writing, as well as in the overall scale.

Another goal of the study was to compare the quantity results from the perspective of experience years and age factors. These variables were demonstrated that they are not effective in teachers' level of TPACK (Koçak, 2013) on contrary to the study of Türker (2020). On the other hand, in the study of Baltaci et al. (2019), it was found that the age of the teachers and their interest in virtual reality varied significantly. However, it was discovered through descriptive analysis that the majority of teachers cited as virtual reality applications are beneficial for students, and as virtual reality applications enhance the quality of education when describing how having a virtual reality classroom had affected their instruction.

When teachers have a favourable perspective of their own self-efficacy, professional issues disappear more quickly; conversely, when they have a negative perception, they worry more about their own professional shortcomings (Tschannen-Moran & Woolfolk Hoy, 2001). While the years of experience variable of this study supported that there is not any significant difference among the participants, in the study of Kılıç and Özkan (2022), in terms of international educational technology standards, SAC teachers have shown low self-efficacy in digital citizenship, information security, and being pioneers in the use of educational technologies. It has been identified that teachers express a knowledge and equipment deficiency in these areas. Thus, efficient pedagogical technology integration requires meaningful teacher efficacy (Moore-Hayes, 2011). Nevertheless, in the study of Giles and Kent (2016), the majority of participants (68%) expressed strong confidence in their abilities to choose and use technology in the classroom, and nearly all (93%) of them included it into their courses regardless of the experience or the age factors. The results of the study also supported that teachers who had high levels of teacher self-efficacy showed more patience with their students (Nen & Ztuna, 2005). This finding can be taken as the teachers' view of the use of technology in language education to create an atmosphere that is inspiring, innovative, appealing, fascinating, and positive with activities and materials that are content-rich.

Suggestions

The study's findings lead to several suggestions for additional investigation. Mainly, by obtaining responses from the participants through observations in classrooms in additional study, and more quantity research can provide a thorough understanding of the phenomenon.

Declerations of Competing Interest

The author declares that she has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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