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An Investigation of TPACK-Practical for Teaching English as a Foreign Language[1]

Eda Yapıcı[2], İsmail Hakkı Mirici [3]

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Abstract

Technological Pedagogical Content Knowledge (TPACK) has been a common subject for different educational purposes from the planning of teaching process to testing and assessment practices. The term "*TPACK-Practical*" refers to a framework based on teachers' knowledge and experience that takes into account the theoretically described TPACK model's structure and the process of teaching practice. The present study aims to describe the nature of technology integration among Turkish EFL in-service instructors by exploring their skill levels to implement their TPACK-Practical in their classroom practices, and by explaining the relationships between these skill levels and some demographic variables. The research was conducted in the contexts of the Schools of Foreign Languages at various universities in Turkey at the end of the second term of 2022/2023 academic year. All EFL instructors teaching at the university level are the study's target population; however, the convenience sample chosen for the study on a voluntary basis only included 155 EFL instructors from these schools who responded to the questions on the data collection instrument (TPACK-Practical scale developed by Yeh et al., 2014). To comprehensively understand the participant profile and collect data to analyze the relations between the variables, the participants' demographic characteristics were also considered. The study has a quantitative research design that employs descriptive statistics to describe the demographic information and scale results; and correlation analysis, independent sample t-test, and ANOVA test to explain the relationships between the variables. Results of the study have revealed that EFL instructors generally use their TPACK-Practical skills in classroom applications at a *"sufficient"* level (at the lowest level in the *Assessments* area and at the highest level in the *Subject Content* area), and that demographic variables have no significant effect on their technology integration skills.

Keywords: TPACK, TPACK-Practical, EFL, technology integration.

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[2] Corresponding author, eda.yapici@adu.edu.tr, Aydın Adnan Menderes University

[3] Author, Hacettepe University

Introduction

In today's modern and dynamic society, students are exposed to cutting-edge technological environments in both their personal and professional lives due to the rapid progress of technology and internet connectivity. Information and Communication Technologies (ICT) serves a crucial role in education, fulfilling four key functions: integration into the curriculum, delivery of instruction, support of instruction and enhancement of the learning process as a whole (Raja & Nagasubramani, 2018).

Nowadays, teachers are playing a larger role in the development and delivery of technology-enhanced classes. The purpose of technology-enhanced learning (TEL), which uses ICT in a variety of educational processes, is to design, develop and describe ICT applications for those processes (Ivanovic et al., 2018). Teachers must combine their technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) to create technology-integrated classes, which Mishra and Koehler (2006) refer to as Technological Pedagogical Content Knowledge (TPACK). Shulman's (1986) Pedagogical Content Knowledge theory forms the foundation of the TPACK framework developed by Koehler and Mishra (2009), outlining the necessary knowledge and skills for teachers to effectively incorporate technology into their teaching.

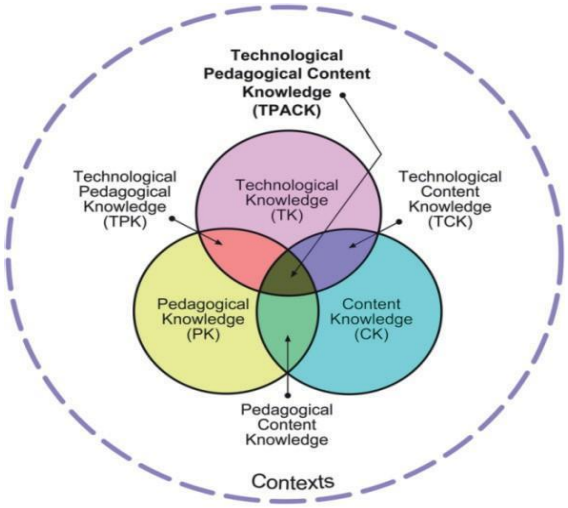

Figure 1. Knowledge Constructs in the TPACK Framework (Adapted from Koehler & Mishra, 2009).

The framework proposed by Koehler and Mishra (2009) as a seven-construct framework contains three interconnected constructs of teachers' knowledge, as shown in Figure 1: Contextual knowledge frames content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK).

Having knowledge of technology and knowing how to incorporate it into educational environments are two separate types of expertise, as highlighted by Mitchell et al. (2019). Being proficient with technology is essential, yet it is not enough to utilize technology effectively for educational purposes. Meaningful technology integration occurs when educators improve their critical thinking and digital literacy skills through practical experience in utilizing and assessing digital resources. This experience enables them to apply their expertise to lifelong learning activities responsibly and intelligently (Falloon, 2020).

When teaching, the teacher's practical knowledge and pedagogical content knowledge are utilized to organize and achieve teaching objectives using appropriate methods. It is important to understand that pedagogical content knowledge is not a static concept, but rather a dynamic one, which is often misunderstood by most people who interpret it as a fixed set of "knowledge". Based on the literature, Yeh et al. (2014) introduced a TPACK-Practical framework (Figure 2) that incorporates knowledge, experience, teaching practice and the theoretical structure of the TPACK model. Figure 2 presented below is directly taken from Yeh et al. (2014, p. 714).

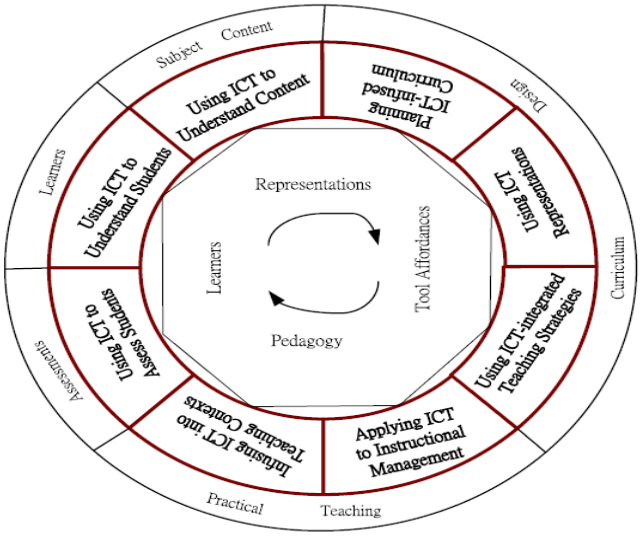

Figure 2: The Framework of TPACK-Practical.

TPACK-Practical framework comprises of eight knowledge dimensions in five pedagogical areas. These pedagogical areas are *Learners*, *Subject Content*, *Curriculum Design*, *Practical Teaching*, and *Assessments*. The knowledge dimensions of these pedagogical areas are *using ICT to understand students, using ICT to understand content, planning ICT-infused curriculum, using ICT representations, using ICT-integrated teaching strategies, applying ICT to instructional management, infusing ICT into teaching contexts, and using ICT to assess students*.

Significance of the Study

This study is significant because it shed light on such a subject that has received little attention. The application of digital technologies in the teaching of English as a foreign language (EFL) has rarely been mentioned in the literature (Ahmed, & Tümen Akyıldız, 2022). From this background, Tondeur et al. (2013) noted that more in-depth information is required regarding the methods and justifications used by teachers to incorporate technology into the lessons they have prepared for their students. As the study involved 155 Turkish EFL instructors who work in various universities across various provinces in Turkey, this study is significant also in terms of determining the overall profile of Turkish EFL teachers' TPACK skills through their self-reporting of actual teaching practices for integrating modern technology.

Furthermore, findings of this study may help explain the considerable contributions that each knowledge component made to the creation of TPACK-Practical and may have implications for teacher education programs that emphasise the integration of technology, and for professional development programs by identifying the needs and opportunities for professional development required to improve teachers' technology integration in the classroom. With a greater awareness and better understanding of the extent to which foreign language teacher education programs are effective in developing teachers' skills in integrating technology into the curriculum, school districts and administrators may benefit from this study to shape teacher training, which will result in better and more targeted professional development.

Purpose of the Study and Research Questions

The purpose of this study is to describe the nature of technology integration among Turkish EFL in-service instructors by exploring their skill levels to implement TPACK-Practical in their teaching practices (a), and by explaining the relationships between their TPACK-Practical skill levels and some demographic variables such as age (b), gender (c), level of education (d), major of study at the university (e), type of working institution (f), years of teaching experience (g) and the level they are teaching (h). The researcher created the following research questions for this quantitative study with these purposes in mind.

Main Research Question:
What are the EFL instructors' TPACK-Practical skill levels, and the relationships between their TPACK-Practical skill levels and the demographic variables discussed in the study?
Sub-Research Questions:
SRQ1. What are the EFL instructors' TPACK-Practical skill levels?
SRQ2. Do the EFL instructors' TPACK-Practical skill levels differ significantly according to age variable?
SRQ3. Do the EFL instructors' TPACK-Practical skill levels differ significantly according to gender variable?
SRQ4. Do the EFL instructors' TPACK-Practical skill levels differ significantly according to level of education variable?
SRQ5. Do the EFL instructors' TPACK-Practical skill levels differ significantly according to major at the university variable?
SRQ6. Do the EFL instructors' TPACK-Practical skill levels differ significantly according to the type of working institution variable?
SRQ7. Do the EFL instructors' TPACK-Practical skill levels differ significantly according to the years of teaching experience variable?

Literature Review

TPACK in Various Educational Environments

The TPACK framework is being seriously explored by scholars and practitioners, since it aims to define the complicated interactions between technology, pedagogy, and content knowledge. The fact that the TPACK framework is referenced in more than 471 scholarly publications on the Web of Science gives evidence of its growing popularity in both research and education (Soler-Costa et al., 2021). The successful integration of technology into education necessitates a thorough understanding of the complex relationships between various types of knowledge, such as content, pedagogy, technology, and context (Koehler et al., 2007). The relationships between various types of knowledge are being investigated to see how effectively to educate preservice teachers for the technological integration that international standards demand. The term *'technological pedagogical content'* refers to professional knowledge in today's classrooms – that is, the ability to correlate and integrate technology into teaching, which may include knowing how to utilize a specific technology, generating materials and activities with that technology, and teaching with technology (Angeli et al., 2016).

In 2018, Willermark conducted a study to identify the common characteristics of TPACK studies in different educational settings. The research analyzed 107 empirical investigations published between 2011 and 2016. The findings indicated that almost half of the studies (47.7%) did not specify the subjects. Among the subject-specific studies, science (15.9%), language (12.1%), mathematics (6.5%) and social studies (2.8%) were the most common areas investigated for TPACK. In this analysis, self-reporting accounted for 71.8% while instructional activity performance made up 28.2% of the TPACK identification. According to a study by Pittman and Gaines (2015); age, level of education and years of teaching experience had little effect on the amount of technology used in the classroom. In contrast to these results, Mailizar et al. (2021) investigated the impact of demographic variables on teachers' TPACK and discovered that teachers' level of education and gender had a significant potency on their TPACK. It was found that teachers with higher education levels had TPACK that was distinctively higher than teachers with lower education levels. According to other studies in the literature, a teacher's level of teaching experience may be extremely important to their TPACK (Hsu et al., 2017; Nazari et al., 2019; Hsu et al., 2021).

TPACK in ESL/EFL Settings

Previous studies conducted in ESL/EFL settings have found that the use of Information and Communication Technology (ICT) in English classes have substantial reflections on teaching and learning of the English language. Additionally, these studies have shown that English language teachers are generally proficient in using their Technological Pedagogical and Content Knowledge (TPACK) in classroom practices (Malik et al., 2019; Pangket, 2022). According to Mirici and Demirbaş (2013), policymakers and universities should take steps to establish and enhance alternative

forms of assessment in language teacher education. This would help to shift the focus away from traditional methods and towards more innovative and effective alternatives, even if this requires additional time and effort. According to a research study, English language teachers were found to be less proficient in using technology as compared to their knowledge of pedagogy and subject content (Alqurashi & Samarin, 2015). As EFL/ESL classes focus on multi-sensory experiences to ensure lasting and engaging learning, a modern EFL/ESL teacher should be adept at using appropriate technology and online teaching tools to create real-life situations for their learners (Biletska et al., 2021).

As per the recommendation of Mirici and Kavaklı (2017), language teachers should possess sufficient ICT skills to develop digital materials that align with the CEFR objectives and reference levels, which are globally accepted standards for modern English Language Teaching. Teachers need to assess their students' cognitive abilities to learn and use a particular technology tool without getting overwhelmed. In doing so, they should emphasize the importance of learning how to learn. Because it gives students more control over their learning process, improves learning outcomes and creates a more individualized experience, the idea of "autonomy" is vital for successful language learning and teaching (Şentürk & Mirici, 2019). Language teachers should concentrate particularly on playing the roles of a mentor, organizer, consultant, prompter, resource, participant or an investigator rather than a supervisor, corrector and assessor. That way, they will have a better chance to interact with their students and encourage learning. Given the crucial role that ICT plays in teaching English, language teachers must be technologically savvy to plan and execute their lessons.

Method

Research Design

The Statistical Package for Social Sciences (SPSS) was used as a data processing tool in the study's quantitative research design to implement descriptive statistics so as to describe demographic data and scale results. Correlation analysis, independent sample t-tests and ANOVA tests were also employed to shed light on the relationships between the variables. Data were presented and described using descriptive statistics, such as the mean, median, mode, minimum and maximum scores, range, variance, standard deviation, etc. (Larson- Hall & Plonsky, 2015). Descriptive statistics were used to organize and explain the characteristics of a sample or population (Salkind, 2013). Descriptive studies seek to describe the current distribution of variables, without exploring causal relationships or other hypotheses. As many researchers agree, they are quite useful for population monitoring, planning and hypothesis generation. Descriptive analysis is capable of standing on its own as a research output when it reveals phenomena or patterns in data that were previously unknown (Queirós et al., 2017). It is critical to remember that descriptive analysis cannot establish a causal relationship in which one variable influences the other. There may be correlations between some variables, but without additional research and analysis, it is impossible to say with absolute certainty that one is the cause of the other. However, quantitative description is frequently a component of a larger study that also includes causal analysis. Because it describes current conditions similarly to how correlational research does, causal research is frequently viewed as a type of descriptive research (Apuke, 2017). To gain a comprehensive understanding of why a specific intervention has a causal effect, it is imperative to utilize both causal and descriptive analysis. A robust causal analysis can assist in assessing the direct impact of the intervention, while an efficient descriptive analysis can aid in identifying the vital characteristics of the population, application and context that are most significant in interpreting results. By combining these two methods, the researcher could gain a deeper understanding of how the intervention affected the target population and created more potent solutions to the underlying problems at hand. Researchers can better apprehend a phenomenon they are interested in by achieving causal and descriptive research. They can then use this understanding to specify potential causal mechanisms, materialize hypotheses and intervention strategies, interpret the findings of their researches, identify issues for practitioners and policymakers to address, and even discover new cases to scrutinize (Loeb et al., 2017). The researcher has explored how the independent variables are reflected by the dependent variables using cause-and-effect relationships between variables. It attempts to pinpoint the causes or factors contributing to the current state of matters (Mohajan, 2020).

This kind of research can be incredibly beneficial in a variety of fields and can offer insightful information that would be challenging to learn through other channels.

Research Population and Sample

The study's target population includes all EFL instructors who work in state or private universities in Turkey and teach English at all levels. Most researchers choose convenience sampling for their studies because, in most cases, it is not practical to include the entire population in every type of research (Etikan et al., 2016). The convenience sample chosen for the study only included 155 voluntary EFL instructors who work in various state or private universities in Turkey. After receiving ethical approval for the study, the researcher contacted the directors of the schools of foreign languages at the state and private universities where the data would be gathered. The frequency and percentage values of the participant demographic variables are shown in Table 1.

Table 1.
Descriptive Statistics on the Demographic Variables

Variable	Category	f	%	Variable	Category	f	%
Gender	Male	104	67,10	Type of Institution	Private University	19	12,30
	Female	50	32,30		State University	136	87,70
	Prefer not to answer	1	0,60	Teaching Experience	1-5 years	19	12,30
Level of Education	BA	23	14,80		6-10 years	23	14,80
	MA	86	55,50		11-15 years	45	29,00
	PhD	46	29,70		16-20 years	35	22,60
Major at the University	ELT	19	12,30		More than 21 years	33	21,30
	Linguistics	93	60,00	The Level of Teaching	A1	55	16,03
	English Language and Literature	26	16,80		A2	70	20,41
	Translation and Interpretation	5	3,20		B1	101	29,45
	American Culture and Literature	7	4,50		B2	75	21,87
	Other	5	3,20		C1	30	8,75
Age	$\bar{x} \pm ss$	38,40±7,96			C2	12	3,50

Reviewing Table 1, it can be seen that 67.10% of the participants are men while 32.30% are women, indicating that the gender variable consists of twice as many men as women. Furthermore, the education level variable shows that 14.80% of the participants have Bachelor's Degrees, 55.50% have master and 29.70% are with Phds. The vast majority of the participants in the study held master degrees. Based on the distribution of participants' majors at the university, we can observe that 12.30% of participants studied English Language Teaching (ELT), 60.00% studied Linguistics, 16.80% English Language and Literature, 3.20% Translation and Interpretation, 4.50% American Culture and Literature, and 3.20% graduated from other departments. It's worth noting that over half of the participants hold degrees in Linguistics as their major field of study. As for the workplace type, 87.70% are employed in state universities, while 12.30% are in private universities. Upon analyzing the distribution of participants based on their years of teaching experience, it seems that the rate of participants with 1–5 years of experience is 12.30%, participants with 6–10 years of experience is 14.80%, with 11–15 years of experience is 29.00%, with 16–20 years of experience is 22.60%, and with 21 years or more of experience is 21.30%. The results show that the participants are distributed among various levels of teaching, with 16.30% at Level A1, 20.41% at Level A2, 29.45% at Level B1, 21.87% at Level B2, 8.75% at Level C1, and 3.50% at Level C2. It is important to note that the instructors made multiple marks for this question, resulting in a sum of frequency numbers greater than the number of samples. When analyzing the distribution of participants by age, the arithmetic mean of their ages was found to be 38.40, with a standard deviation of 7.96.

Data Collection

All the voluntary EFL instructors employed in the foreign language programs at various universities were given the TPACK-Practical scale by the researcher either in person or via a link to Google Forms, one of the most popular survey distribution tools available today. Yeh et al. (2014) developed and validated a 5-point Likert-type scale to assess teachers' capacity to apply their technological pedagogical content knowledge in the classroom. The scale is divided into two parts. The first section contains demographic questions aiming at gathering descriptive information about the participants' characteristics. This data is used to examine the relationship between the scale results and the demographic variables being studied. The second section of the scale consists of 22 indicators across eight knowledge dimensions in five pedagogical areas.

A review of the studies employing the TPACK-Practical framework in their work was done in order to confirm the validity and reliability of the scale to be used in the current study (Ay et al., 2015; Aktaş & Özmen, 2022). Results of one of the studies revealed a Cronbach's alpha of 0.89, demonstrating overall reliability. In the other study, the Kendall's W coefficient—which measures the degree of agreement between the researchers' results—was determined to be 0.962.

Data Analysis

The demographic information and scale results collected in this study were analyzed using descriptive statistics via the Statistical Package for Social Sciences (SPSS) as a data processing tool. Correlation analysis, independent sample t-test and ANOVA test were applied to explain the relationships between the variables. The scoring procedures provided by the designers of the scale were followed by the researcher. The level of in-class application of TPACK-Practical skills by the English instructors was assessed using the average scores for the five pedagogical areas of the scale. When interpreting the average scores from the pedagogical areas identified as Learners (three indicators), Subject Content (two indicators), Curriculum Design (eight indicators), Practical Teaching (six indicators), and Assessments (three indicators), the score ranges prepared on the basis of the theoretical framework ascertained in Table 2 are used as a guide. Since 1 (strongly disagree) was the lowest score and 5 (strongly agree) was the highest on the Likert-type scale, the range value for their scores was resolved to be 4 (5-1), and the grade range was determined to be 0.8 (4/5) points by dividing the range value by the number of participants.

Table 2.
Scoring Ranges of the TPACK-Practical Skill Levels

Scoring Ranges	Lower and Upper Limits
(1) Insufficient	1.00 - 1.79
(2) Very little sufficient	1.80 - 2.59
(3) Slightly sufficient	2.60 - 3.39
(4) Sufficient	3.40 - 4.19
(5) Very sufficient	4.20 - 5.00

The independent sample t-test was employed to correspond the two groups, and the ANOVA test was utilized to compare more than two groups, to establish whether there is a statistically significant difference between the average scores conveyed from the pedagogical areas identified as Learners, Subject Content, Curriculum Design, Practical Teaching and Assessments, and demographic variables (Schober, Boer and Schwart, 2018).

The Pearson Product-Moment Correlation coefficient was used to traditionally explore the relationships between the variables. Hence, using the observed correlation coefficient's absolute magnitude, a correlation coefficient between 0.00-0.10 was considered negligible, 0.10-0.39 weak, 0.40-0.69 moderate, 0.70-0.89 strong, and 0.90 and 1.00 indicated a quite strong correlation (Schober, Boer, and Schwart, 2018).

Limitations

1. The context of study is limited to EFL instructors at the university level and excludes K12 teachers in public education. To enable more comprehensive generalizations of the findings, further research should be conducted with a larger sample size in diverse contexts.

2. Even though the study investigates the instructors' technology integration skills, it might not be possible to entirely explore all aspects since the main emphasis is on their skills and the relationships between the variables.

3. It's worth noting that the use of convenience sampling could potentially lead to a biased sample, as it may only attract participants who are particularly knowledgeable or interested in the subject at hand.

Findings

The purpose of the study is to seek for the answer to the main research question; *"What are the EFL instructors' TPACK-Practical skill levels, and the relationships between their TPACK-Practical skill levels and the demographic variables discussed in the study?".* A number of sub-research questions were developed based on the main research question. The study's findings are presented under each sub-research question as follows.

Findings Based on the First Sub-Research Question

Descriptive statistics were used to assess the TPACK-Practical skill levels of the EFL instructors in their classroom practices for addressing the first sub-research question (SRQ-1) of the study; *"What are the EFL instructors' TPACK-Practical skill levels?".* As a result, Table 3 provides descriptive statistics for the average scores obtained from the pedagogical areas identified as *Learners, Subject Content, Curriculum Design, Practical Teaching,* and *Assessments*.

Table 3.
Descriptive Statistics of the EFL instructors' TPACK-Practical Skill Levels

Variable	N	$\bar{x}$	Sd	Mode	Median	Skewness	Kurtosis	Min.	Max.
Learners	155	3,66	0,78	3,67	3,67	-0,82	0,66	1,33	5,00
Subject Content	155	3,96	0,83	4,00	4,00	-1,19	2,27	1,00	5,00
Curriculum Design	155	3,72	0,73	3,50	3,75	-0,99	1,77	1,13	5,00
Practical Teaching	155	3,74	0,79	3,67	3,83	-0,95	1,16	1,00	5,00
Assessments	155	3,44	0,87	3,33	3,66	-0,69	0,69	1,00	5,00
Total	155	3,70	0,70	3,68	3,72	-1,15	2,34	1,09	4,91

In the first area defined as *Learners* of 155 English instructors, the arithmetic mean was calculated as 3,96 ($\bar{x}$=3,96) and the standard deviation was determined as 0.78 in Table 3. The level of information and communication technologies (ICT) used by the instructors in understanding their students was found to be between 3.40 and 4.19, and as a result, it was considered "*sufficient*" based on this result. The central tendency measures were discovered to be quite close to each other in the *Learners* area, where the lowest score was 1.33 and the highest was 5.00. The coefficients for skewness (-0.82) and kurtosis (0.66) were also observed to be in the range of ±1.00. The arithmetic mean was calculated as 3,96 ($\bar{x}$=3,96) and its standard deviation was calculated using descriptive statistics to assess the extent to which ICT, the second area of the scale, was used to comprehend the subject content. In light of this finding, it was resolved that the instructors' use of ICT to comprehend the subject content ranged from 3.40 to 4.19, and as a result, it was considered *"sufficient"*. The *Subject Content* area had a range of scores from 1.00 to 5.00, and it was found that the measures of central tendency for the median (4.00) and mode (4.00) were remarkably similar. The skewness (-1,19) and kurtosis (2.27) coefficients were also seen to be slightly outside the range of ±1.00. For the third area of the scale, or the level of using ICT in *Curriculum Design*, the arithmetic mean was determined as 3.72 ($\bar{x}$=3.72) and standard deviation was 0.73. The level of ICT used by the instructors in *Curriculum Design* was found to be

between 3.40 and 4.19, which was considered *"sufficient"* based on this result. The lowest and highest scores for the *Curriculum Design* area were 1.13 and 5.00, and it showed that the median (3.75) and mode (3.50) measures of central tendency were remarkably similar. It was also seen that the skewness (-0.99) and kurtosis (1.77) coefficients were slightly out of the range of ±1.00. Among the descriptive statistics obtained to determine the level of *Practical Teaching* use of ICT, the fourth area of the scale, the arithmetic mean was calculated as 3.74 ($\bar{x}$=3.74), and its standard deviation was determined as 0.79. According to this result, it was specified that the level of use of ICT by the instructors in *Practical Teaching* was in the range of 3.40-4.19, and therefore it was considered *"sufficient"*. In the *Practical Teaching* area, the lowest score was 1.00 while the highest was 5.00, which indicated that the median (3.83) and mode (3.67) of the central tendency measures were quite close to each other. In addition, the skewness (-0.95) and kurtosis (1.16) coefficients turned out to be slightly out of the range of ±1.00. From the descriptive statistics obtained to specify the level of using ICT, the fifth and last area of the scale, *Assessments* of students, the arithmetic mean was calculated as 3.44 ($\bar{x}$=3.44) and its standard deviation was 0.87. This showed that the level of use of ICT by the instructors in the evaluation of students was in the range of 3.40-4.19 and *"sufficient"*. The lowest and highest scores for the *Assessments* area were 1.00 and 5.00, and the median (3.66) and mode (3.33) measures of central tendency were found to be very close to one another. The skewness (-0.69) and kurtosis (0.69) coefficients were also in the range of ±1.00.

When the total scores from the TPACK-Practical scale were taken into account, the arithmetic mean was calculated as 3.70 ($\bar{x}$=3,70) and its standard deviation was found to be 0.70. This has led to the conclusion that English instructors generally use their technological pedagogical content knowledge in classroom applications at a *"sufficient"* level. Additionally, it was found that the central tendency measures related to the scores acquired from the scale had a median (3.72) and a mode (3.68) that were relatively close to each other. Accordingly, it has been demonstrated that the scores from the TPACK-Practical scale and its pedagogical ares have a normal distribution, and that parametric analysis techniques should be employed to test any differences in the demographic variables identified within the study's scope. The histogram graph obtained to determine the EFL instructors' TPACK-Practical skill levels is shown in Figure 3.

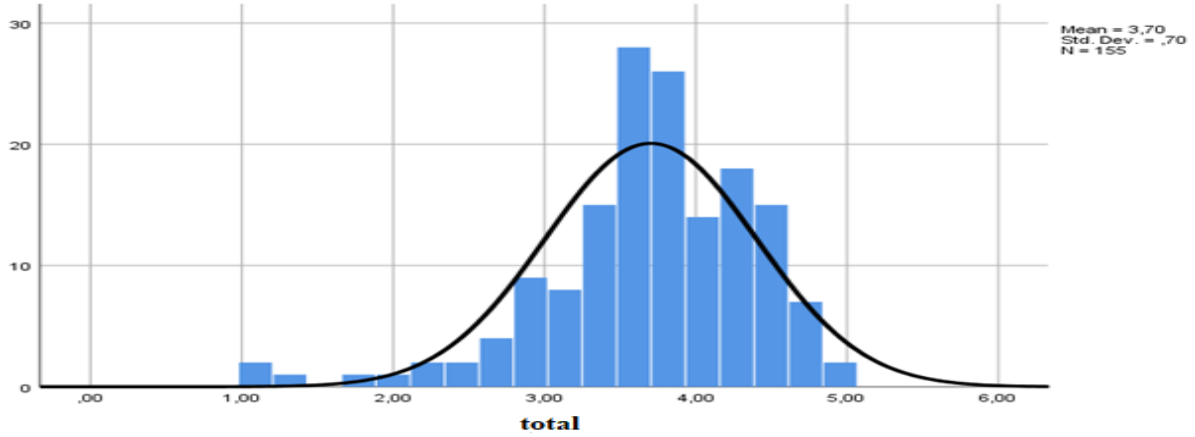

Figure 3. The histogram Graph Related to the EFL Instructors' TPACK-Practical Skill Levels

When the distribution of the scores from the TPACK-Practical scale, used to assess the levels of the TPACK-Practical skills of the EFL instructors, is examined in Figure 3, it is clearly seen that this distribution does not significantly deviate from the normal distribution. It is therefore specified that the scores obtained from the TPACK-Practical Scale show a normal distribution in light of the results obtained from both descriptive statistics and graphical methods.

Table 4.
Descriptive Statistics of the Dimensions and Indicators in the TPACK-Practical Scale

Dimension	Indicator	SD	D	N A/D	A	SA	$\bar{x}$	Sd	Min	Max.
A. Using ICT to understand students	A1	4	9	28	73	41	3,89	0,95	1,00	5,00
	A2	6	19	46	64	20	3,47	0,99	1,00	5,00
	A3	1	15	47	70	22	3,62	0,86	1,00	5,00
B. Using ICT to understand subject content	B1	3	12	20	78	42	3,92	0,94	1,00	5,00
	B2	4	6	24	75	46	3,98	0,91	1,00	5,00
C. Planning curriculum –> Planning ICT-infused curriculum	C1	3	17	43	66	26	3,61	0,95	1,00	5,00
	C2	2	20	28	69	36	3,75	0,99	1,00	5,00
	C3	3	16	49	65	22	3,56	0,92	1,00	5,00
D. Representations –> Using ICT representations to present instructional representations	D1	2	12	36	73	32	3,78	0,90	1,00	5,00
	D2	4	10	30	77	34	3,81	0,93	1,00	5,00
	D3	4	11	27	79	34	3,82	0,94	1,00	5,00
E. Teaching strategies –> Employing ICT-integrated teaching strategies	E1	3	17	44	64	27	3,61	0,96	1,00	5,00
	E2	2	10	30	86	27	3,81	0,84	1,00	5,00
F. Instructional management –> Applying ICT to instructional management	F1	3	8	37	77	30	3,79	0,88	1,00	5,00
	F2	4	16	41	60	34	3,67	1,01	1,00	5,00
G. Teaching practices –> Infusing ICT into teaching contexts	G1	3	18	25	74	35	3,77	0,99	1,00	5,00
	G2	4	10	24	81	36	3,87	0,93	1,00	5,00
	G3	3	15	32	80	25	3,70	0,92	1,00	5,00
	G4	2	21	38	65	29	3,63	0,98	1,00	5,00
H. Assessments –> Using ICT to assess students	H1	7	29	50	52	17	3,27	1,03	1,00	5,00
	H2	8	15	38	64	30	3,60	1,06	1,00	5,00
	H3	7	16	54	55	23	3,45	1,01	1,00	5,00

* Strongly Disagree: SD Disagree: D Neither Agree/Disagree Agree: A Strongly Agree: SA

Looking at Table 4, it is seen that a total of 155 English instructors expressed their opinions in the B2 coded expression *"I am able to identify the subject topics that can be better presented with ICT"*, which is the second indicator of the dimension of *"using ICT to understand the subject content*" at the highest level. The arithmetic mean and standard deviation for the related indicator were calculated to be 3.98 and 0.91, respectively. The instructors' scores on the indicator are deemed to be *"sufficient"* based on the average since they fall between 3.40 and 4.19. They were found to have expressed their opinions in the B1 coded statement *"I am able to use ICT to better understand the subject content*" in the same dimension as the scale's second-highest average. The arithmetic mean and standard deviation for the related indicator were calculated to be 3.92 and 0.91, respectively. The instructors' scores on the indicator were *"sufficient"* based on the average since they were between 3.40 and 4.19. When the findings are considered collectively, it can be concluded that English instructors utilize ICT to the fullest extent possible. The H1 coded statement *"I know the types of technology-infused assessment approaches"* in the dimension of *"using ICT to assess students"* in the area of *Assessments* was found to have the lowest average among the scale's indicators. The related indicator's arithmetic mean was 3.27 while the standard deviation was 1.03. The scores of the instructors on the the indicator range from 2.60 to 3.39, so it is considered *"slightly sufficient"* based on the average that was obtained. The H3 coded statement *"I am able to use ICT to assess students' learning progress"* in the same dimension was found to have the second-lowest average on the scale. The related indicator's arithmetic mean was 3.45, and its standard deviation was 1.01. The instructors' scores on the indicator seem to be

"sufficient" based on the average since they are between 3.40 and 4.19. When the data is combined, it can be said that English instructors only use ICT at the lowest level in the *Assessments* area.

Findings Based on the Second Sub-Research Question

In the second sub-research question (SRQ-2) of the study, it is investigated whether the scores obtained from the five pedagogical areas of the TPACK-Practical Scale show a significant difference according to the age variable. Table 5 displays the correlation matrix that details the findings of the correlation analysis between the age variable and the average scores obtained from the entire scale and its pedagogical areas.

Table 5.
Correlation Analysis Results

		1	2	3	4	5	6	7
TPACK-Practical Skills	1.Learners	1						
	2.Subject Content	.623**	1					
	3.Curriculum Design	.744**	.738**	1				
	4.Practical Teaching	.728**	.717**	.855**	1			
	5.Assessments	.551**	.448**	.695**	.709**	1		
	6.Total	.821**	.788**	956**	.943**	.790**	1	
	7.Age	-.145	-.094	-.114	-.036	-.097	-.103	1

** The correlation coefficient is significant at the 0.01 level; *. The correlation coefficient is significant at the 0.05 level.

Analysing Table 5, it is seen that there were negative correlations between the ages of the instructors and the pedagogical areas of *Learners, Subject Content, Curriculum Design, Practical Teaching* and *Assessments*, respectively. It was settled that there was a weak negative and statistically insignificant relationship between the age variable and understanding learners (r=-0.145; p>.05). It was also established that there was a negative, insignificant and statistically insignificant relationship between the age variable and the subject content (r=-0,094; p>.05). Furthermore, the age variable and curriculum design were found to have a weakly negative and statistically insignificant relationship (r=-0.114; p>.05). The relationship between the age variable and practical teaching was found to be negative, insignificant, and statistically insignificant (r=-0.036; p>.05). The relationship between the age variable and *Assessments* was also found to be negative, insignificant, and statistically insignificant (r=-0,097; p>.05). All in all, the total scores obtained from the scale were found to have a weakly negative and statistically insignificant relationship with age (r=-0.103; p>.05). When all of the results are taken into account, it can be concluded that there is no relationship between the age variable and the scale scores, or, in other words, that age has no effect on the scale scores. This result is consistent with those of another study, which found that participants' knowledge levels were not significantly impacted by participants' age (Hsu, & Chen, 2018).

Findings Based on the Third Sub-Research Question

In the third sub-research question (SRQ-3) of the study, it is investigated whether the scores obtained from the five pedagogical areas of the TPACK-Practical Scale show a significant difference according to the gender variable. The analyses were conducted on 154 participants because one participant did not make any mark on the gender variable. An independent sample t-test was conducted to see if there was a statistically significant difference between the scores obtained from the five pedagogical areas of the TPACK-Practical Scale according to the gender variable. Table 6 provides the analysis results.

Table 6.
T-test Results According to the Gender Variable

Variable	Gender	N	$\bar{x}$	Sd	t	df	p
Learners	Male	104	3,68	0,67	0,46	152	.644
	Female	50	3,62	0,98			
Subject Content	Male	104	3,99	0,68	0,80	152	.424
	Female	50	3,88	1,08			
Curriculum Design	Male	104	3,77	0,59	1,32	152	.188
	Female	50	3,61	0,95			
Practical Teaching	Male	104	3,81	0,65	1,55	152	.121
	Female	50	3,60	1,01			
Assessments	Male	104	3,48	0,77	0,77	152	.438
	Female	50	3,36	1,05			
Total	Male	104	3,75	0,56	1,27	152	.205
	Female	50	3,60	0,92			

Following the analysis of Table 6, it was concluded that although male instructors ($\bar{x}$=3,68) had higher scores than female instructors ($\bar{x}$=3,62) in the *Learners* area, this disparity was not statistically significant ($t_{(152)}$=0,46; p>.05). This finding indicates that English instructors' skills to use their TPACK-Practical to understand students is unaffected by the gender variable. According to the findings of the study, there were no significant discrepancies in scores between male and female instructors in the *Learners* area. However, in the second area of the scale, *Subject Content*, male instructors were found to have slightly higher scores compared to their female counterparts ($\bar{x}$=3.99 and $\bar{x}$=3.88, respectively). Nonetheless, this difference was not deemed statistically significant ($t_{(152)}$=0,80; p>.05). The study findings indicate that gender does not impact the English instructors' proficiency in utilizing their Technological Pedagogical Content Knowledge to understand the subject content. In simpler terms, it can be inferred that male and female instructors scored similarly in the *Subject Content* area. Although male instructors scored slightly higher ($\bar{x}$=3,77) than female instructors ($\bar{x}$=3,61) in the *Curriculum Design* area, this difference was not statistically significant ($t_{(152)}$=1,32; p>.05). Therefore, the gender of English instructors does not have an impact on their ability to use their TPACK-Practical in the *Curriculum Design* area. In conclusion, both male and female instructors scored similarly in the *Curriculum Design* area. Despite male instructors scored higher ($\bar{x}$=3.81) than female instructors ($\bar{x}$=3.60) in the fourth area, *Practical Teaching*, the difference was considered statistically insignificant ($t_{(152)=}$1.55; p>.05). This suggests that gender does not affect the ability of English instructors to apply their TPACK-Practical skills in *Practical Teaching*. Essentially, both male and female instructors scored similarly in this area. Although male instructors scored higher ($\bar{x}$=3.48) than female instructors ($\bar{x}$=3.36) in the *Assessments* area of the scale, statistical analysis ($t_{(152)=}$0.77; p>.05) indicated that this difference was not significant. So, the gender of English instructors does not affect their ability to use Technological Pedagogical Content Knowledge during assessments. In other words, both male and female instructors performed similarly in the *Assessments* area. While male instructors ($\bar{x}$=3.75) scored higher on the TPACK-Practical Scale than their female counterparts ($\bar{x}$=3.60), the difference was considered statistically insignificant ($t_{(152)=}$1.27; p>.05). As such, it was resolved that gender did not have a significant impact on the TPACK-Practical Scale or its pedagogical areas, as determined by the total scores obtained from the scale. The study's finding aligns with other research studies (Cai et al., 2017; Sariçoban et al., 2019) which also found no significant difference between gender and technology usage. However, males generally tend to have more positive attitudes and self-confidence towards technology use.

Findings Based on the Fourth Sub-Research Question

In the fourth sub-research question (SRQ-4) of the study, it is investigated whether the scores obtained from the five pedagogical areas of the TPACK-Practical Scale show a significant difference according to the level of education variable. To determine whether the scores obtained from the TPACK-Practical Scale, which consists of a total of 22 indicators in five pedagogical areas, show a significant difference according to the level of education variable (bachelor's-BA, master's-MA, and doctorate-PhD), a One-Way Analysis of Variance was applied and the analysis results are shown in Table 7.

Table 7.
ANOVA Test Results According to the Level of Education Variable

Variable	Level of Education	N	$\bar{x}$	Sd	F	df	Sig.	Difference
Learners	1.BA	23	3,36	0,99	2,24	154	.110	−
	2.MA	86	3,75	0,62				
	3.PhD	46	3,65	0,91				
Subject Content	1.BA	23	3,87	1,10	0,24	154	.715	−
	2.MA	86	4,01	0,68				
	3.PhD	46	3,91	0,94				
Curriculum Design	1.BA	23	3,41	0,79	2,86	154	.061	−
	2.MA	86	3,81	0,63				
	3.PhD	46	3,71	0,85				
Practical Teaching	1.BA	23	3,53	0,93	1,00	154	.370	−
	2.MA	86	3,76	0,69				
	3.PhD	46	3,80	0,89				
Assessments	1.BA	23	3,00	1,05	3,95	154	**.021**	1−3
	2.MA	86	3,48	0,79				
	3.PhD	46	3,60	0,87				
Total	1.BA	23	3,42	0,82	2,25	154	.108	−
	2.MA	86	3,76	0,57				
	3.PhD	46	3,73	0,82				

Table 7 reveals that instructors with master's degree ($\bar{x}$=3.75) scored higher in understanding *Learners* area compared to PhD graduate instructors ($\bar{x}$=3.65) and instructors with Bachelor's degree ($\bar{x}$=3.36). Nevertheless, the difference was not statistically significant ($F_{(2-154)=}$2.24; p>.05). Therefore, it was inferred that the instructors with BA, MA, and PhD degrees had a similar level of proficiency in using ICT to understand students. In terms of using ICT, the second area of the scale, to understand the *Subject Content*, MA instructors ($\bar{x}$=4.01) had higher scores than PhD instructors ($\bar{x}$=3.91) and BA instructors ($\bar{x}$=3.87). The difference was found to be statistically not significant, though ($F_{(2-154)}$=0,24; p>.05). In other words, in terms of the scores obtained in the dimension of "*using ICT to understand the subject content"*, it was concluded that the instructors at every degree were at a similar level. It was resolved that MA instructors ($\bar{x}$=3.81) had higher scores than PhD instructors ($\bar{x}$=3.71) and BA instructors ($\bar{x}$=3.41), respectively. In other words, in terms of the scores obtained in the area of using ICT in *Curriculum Design*, it was concluded that the instructors at every degree were at a similar level. In terms of using ICT, the fourth area of the scale, in *Practical Teaching*, PhD instructors ($\bar{x}$=3,80) had higher scores than MA ($\bar{x}$=3,76) and BA instructors ($\bar{x}$=3.53). However, it was again concluded that the difference was not statistically significant ($F_{(2-154)}$=1,00; p>.05). In other words, it was determined that the instructors at every degree were at a similar level in terms of the scores obtained in the area of using ICT in *Practical Teaching*. The number of MA ($\bar{x}$=3.48) and PhD instuctors ($\bar{x}$=3,60) were found to have higher scores than BA instructors ($\bar{x}$=3,00) when it comes to the *Assessments*, which is the fifth area of the scale. It was determined that this score disparity was statistically significant ($F_{(2-154)}$=3,95; p<.05). The difference between instructors with a master's degree and those with Phd in this area was found to be significant (I-J=0.60; p.05) after the Bonferroni multiple comparison test, which was used to determine from which groups this difference between instructors teaching English at different education levels, was conducted. In other words, it was discovered that instructors with a PhD degree used ICT in the *Assessments* area noticeably more often than instructors with master's degree. Additionally, it was found that there was no significant difference between the total scores on the scale and education level ($F_{(2-154)}$=2,25; p>.05).

Findings Based on the Fifth Sub-Research Question

In the fifth sub-research question (SRQ-5) of the study, it is investigated whether the scores obtained from the five pedagogical areas of the TPACK-Practical Scale show a significant difference according to the major of study at the university variable. For this reason, a One-Way Analysis of Variance (ANOVA) was conducted to see if there was a significant difference between the pedagogical areas of the TPACK-Practical Scale, which has a total of 22 indicators in five pedagogical areas, and the scores

obtained from it. English Language Teaching (ELT), Linguistics, English Language and Literature, Translation and Interpretation, American Culture and Literature, and Other make up the major of study at the university. Table 8 displays the findings of the analysis.

Table 8.
ANOVA Test Results According to the Major at the University Variable

Variable	Major at the University	N	$\bar{x}$	Sd	F	df	Sig.	Difference
Learners	English Language Teaching (ELT)	19	3,63	0,74	1,31	154	.261	−
	Linguistics	93	3,67	0,79				
	English Language and Literature	26	3,62	0,77				
	Translation and Interpretation	5	3,00	1,11				
	American Culture and Literature	7	4,14	0,66				
	Other	5	3,80	0,38				
Subject Content	English Language Teaching (ELT)	19	3,97	0,61	0.71	154	.613	−
	Linguistics	93	3,94	0,87				
	English Language and Literature	26	3,94	0,88				
	Translation and Interpretation	5	3,50	1,12				
	American Culture and Literature	7	4,36	0,63				
	Other	5	4,20	0,57				
Curriculum Design	English Language Teaching (ELT)	19	3,90	0,56	1,11	154	.358	−
	Linguistics	93	3,68	0,77				
	English Language and Literature	26	3,71	0,62				
	Translation and Interpretation	5	3,28	1,06				
	American Culture and Literature	7	4,11	0,63				
	Other	5	3,88	0,70				
Practical Teaching	English Language Teaching (ELT)	19	3,89	0,75	1,76	154	.124	−
	Linguistics	93	3,72	0,79				
	English Language and Literature	26	3,69	0,81				
	Translation and Interpretation	5	2,93	1,03				
	American Culture and Literature	7	4,14	0,60				
	Other	5	4,07	0,57				
Assessments	English Language Teaching (ELT)	19	3,56	0,65	0,45	154	.811	−
	Linguistics	93	3,41	0,93				
	English Language and Literature	26	3,49	0,89				
	Translation and Interpretation	5	3,13	0,96				
	American Culture and Literature	7	3,76	0,46				
	Other	5	3,27	0,95				
Total	English Language Teaching (ELT)	19	3,82	0,54	1,28	154	.274	−
	Linguistics	93	3,68	0,74				
	English Language and Literature	26	3,68	0,63				
	Translation and Interpretation	5	3,15	1,01				
	American Culture and Literature	7	4,10	0,57				
	Other	5	3,86	0,53				

According to Table 8, instructors in American Culture and Literature scored the highest in the understanding *Learners* area ($\bar{x}$=4.14) while instructors in Translation and Interpretation scored the lowest ($\bar{x}$=3.00). The ANOVA test, which was used to see if there was a difference between the groups in how well the university's instructors from various majors used ICT to understand their students, concluded that there was not a statistically significant difference between the groups ($F_{(2-154)}$=1,31; p>.05). In other words, it was concluded that the instructors who graduated from different majors were at a similar level in terms of the scores obtained in the dimension of "*using ICT to understand students"*. Instructors at American Culture and Literature received the highest score on the *Subject Content* area of the scale ($\bar{x}$=4.36), while instructors at Translation and Interpretation received the lowest score ($\bar{x}$=3.50). The ANOVA test was used to define whether there was a statistically significant difference between the groups in terms of how university instructors from various majors used ICT to comprehend the subject content. The results showed that there was not a statistically

significant difference between the groups ($F_{(2-154)}$=0,71; p>.05). In other words, it was concluded that the instructors who graduated from different majors were at a similar level in terms of using ICT to understand the subject content. In the area of *Curriculum Design*, the third area of the scale, American Culture and Literature graduates got the highest score ($\bar{x}$=4.11), while the lowest score was obtained by Translation and Interpretation graduates ($\bar{x}$=3.28). As a result of the ANOVA test accomplished to determine whether the instructors in different majors of study at the university show a significant difference in terms of using ICT in *Curriculum Design*, it was concluded that the difference between the groups was not statistically significant ($F_{(2-154)}$=1,11; p>.05. In other words, it was determined that the instructors from various majors of study are on par in terms of their use of ICT in *Curriculum Design*. Graduates of American Culture and Literature scored the highest on the *Practical Teaching* area of the scale ($\bar{x}$=4.14) while those of Translation and Interpretation scored the lowest ($\bar{x}$=2.93). The ANOVA test was used to determine whether there was a statistically significant difference between the groups in how the university instructors in various majors of study used ICT in *Practical Teaching*. The results showed that there was not ($F_{(2-154)}$=1,76; p>.05). The study found that instructors across different majors demonstrate a similar level of proficiency in using ICT for *Practical Teaching*. Among the pedagogical areas of the scale, Instructors graduated from American Culture and Literature scored highest ($\bar{x}$=3.76) in *Assessments*, while instructors graduated from Translation and Interpretation scored lowest ($\bar{x}$=3.13). An ANOVA test was conducted to discern if there was a significant difference in ICT use for evaluating students among instructors in different majors at the university. However, the test results showed that there was no statistically significant difference between the groups ($F_{(2-154)}$=0,45; p>.05). In other words, it was determined that the instructors from various majors had similar levels of proficiency in using ICT to assess students. Additionally, it was found that there was no significant difference between the total scores on the scale and major of study at the university variable ($F_{(2-154)}$=2,25; p>.05).

Findings Based on the Sixth Sub-Research Question

In the sixth sub-research question (SRQ-6) of the study, it is investigated whether the scores obtained from the five pedagogical areas of the TPACK-Practical Scale show a significant difference according to the type of working institution variable. An independent sample t-test was conducted to determine whether there is a significant difference in the scores obtained from the TPACK-Practical Scale, which has a total of 22 indicators in five pedagogical areas, depending on the variable of the type of working institution. Findings of the analysis are shown in Table 9.

Table 9.
T-test Results According to the Type of Working Institution Variable

Variable	Institution	N	$\bar{x}$	Sd	t	df	p
Learners	Private University	19	4,00	0,53	2,02	153	**.044**
	State University	136	3,62	0,80			
Subject Content	Private University	19	4,39	0,61	2,48	153	**.014**
	State University	136	3,90	0,84			
Curriculum Design	Private University	19	3,86	0,56	0,84	153	.400
	State University	136	3,70	0,75			
Practical Teaching	Private University	19	3,82	0,74	0,43	153	.662
	State University	136	3,73	0,80			
Assessments	Private University	19	3,49	0,73	0,24	153	.807
	State University	136	3,44	0,89			
Total	Private University	19	3,86	0,55	1,06	153	.287
	State University	136	3,68	0,72			

Upon analyzing Table 9, it was revealed that instructors at private universities ($\bar{x}$=4.00) scored higher than those at state universities ($\bar{x}$=3.62) in the *Learners* area and this difference was found to be statistically significant ($t_{(152)}$=2,02; p<.05). This finding indicates that English instructors' capacity to use technological pedagogical content knowledge to understand learners is significantly influenced by the variable of the working institution. In other words, it has been determined that the levels of the

instructors at the state university and the private university differ in terms of the results obtained in the *Learners* area. In a similar vein, it was found that instructors employed by private universities received higher *Subject Content* scores than those employed by state universities ($\bar{x}$=4.39 vs. $\bar{x}$=3.90) and that this difference was statistically significant ($t_{(152)}$=2,48; p<.05). This finding suggests that the type of institution variable has a significant impact on English instructors' ability to apply their Technological Pedagogical Content Knowledge to understand the subject content. In other words, it was determined that the instructors employed at the state university and the private university were at different levels based on the scores received in the *Subject Content* area. Although instructors employed by private universities received higher scores than those employed by state universities ($\bar{x}$=3.70), it was ascertained that this difference was not statistically significant for the third area of the scale, *Curriculum Design* ($t_{(152)}$=0,84; p>.05). This finding indicates that English instructors' ability to use their technological pedagogical content knowledge when designing the curriculum is unaffected by the type of working institution variable. In other words, the instructors at state and private universities performed similarly in terms of the scores obtained in the area of *Curriculum Design*. It was also found out that although instructors employed by private universities ($\bar{x}$=3.82) outperformed those employed by state universities ($\bar{x}$=3.73) in terms of *Practical Teaching*, this difference was not statistically significant ($t_{(152)}$=0,43; p>.05). According to this result, it is safe to say that the type of institution variable does not have any effect on the ability of English instructors to use their Technological Pedagogical Content Knowledge in the *Practical Teaching* area. In other words, in terms of the scores obtained in the *Practical Teaching* area, it was concluded that the instructors of both types of instutions were at a similar level. For the *Assessments*, the fifth area of the scale, it was concluded that although instructors working at private universities ($\bar{x}$=3.49) had higher scores than their colleagues at state universities ($\bar{x}$=3.44), this difference was not statistically significant ($t_{(152)}$=0,24; p>.05). According to this result, it can be said that the type of working institution variable does not have any effect on the ability of English instructors to use their Technological Pedagogical Content Knowledge in the *Assessments* area. In other words, in terms of the scores obtained in the *Assessments* area, the instructors at both types of instutions were at a similar level. According to the total scores obtained from the scale, although instructors working at private universities ($\bar{x}$=3.86) had higher scores than their counterparts at state universities ($\bar{x}$=3.68), this difference was not statistically significant ($t_{(152)}$=1,06; p>.05). According to this result, it was determined that the variable of the type of working institution did not cause a significant difference in the TPACK-Practical Scale used in the study and the areas of the scale.

Findings Based on the Seventh Sub-Research Question

In the seventh sub-research question (SRQ-7) of the study, it is investigated whether the scores obtained from the five pedagogical areas of the TPACK-Practical Scale show a significant difference according to the years of teaching experience variable. For this reason, One-Way Analysis of Variance (ANOVA) was conducted to determine whether the scores obtained from the TPACK-Practical Scale, which consisted of a total of 22 indicators in five pedagogical areas, ascertained a significant difference according to the variable of years of teaching experience. The years of teaching experience consist of five categories: 1-5 years, 6-10 years, 11-15 years, 16-20 years and over 21 years. ANOVA test results are shown in Table 10.

Table 10.
ANOVA Test Results According to the Years of Teaching Experience Variable

Variable	Experience	N	$\bar{x}$	Sd	F	df	Sig.	Difference
Learners	1-5 years	19	3,58	0,82	1,68	154	.157	−
	6-10 years	23	3,86	0,82				
	11-15 years	45	3,69	0,66				
	16-20 years	35	3,80	0,64				
	More than 21 years	33	3,39	0,98				
Subject Content	1-5 years	19	4,05	0,88	0.73	154	.568	−
	6-10 years	23	4,11	0,92				
	11-15 years	45	3,90	0,78				
	16-20 years	35	4,04	0,68				
	More than 21 years	33	3,79	0,96				
Curriculum Design	1-5 years	19	3,59	0,78	0,92	154	.454	−
	6-10 years	23	3,88	0,85				
	11-15 years	45	3,79	0,69				
	16-20 years	35	3,76	0,62				
	More than 21 years	33	3,56	0,78				
Practical Teaching	1-5 years	19	3,47	0,85	0,84	154	.502	−
	6-10 years	23	3,91	0,85				
	11-15 years	45	3,79	0,77				
	16-20 years	35	3,74	0,66				
	More than 21 years	33	3,71	0,89				
Assessments	1-5 years	19	3,40	0,90	0,44	154	.776	−
	6-10 years	23	3,48	0,79				
	11-15 years	45	3,54	0,95				
	16-20 years	35	3,48	0,69				
	More than 21 years	33	3,28	0,99				
Total	1-5 years	19	3,57	0,74	0,82	154	.509	−
	6-10 years	23	3,85	0,81				
	11-15 years	45	3,75	0,66				
	16-20 years	35	3,75	0,57				
	More than 21 years	33	3,56	0,78				

Analyzing Table 10, it is seen that the highest score in the understanding *Learners* area was received by instructors with 6-10 years of experience ($\bar{x}$=3.85), while instructors with 21 years or more of experience ($\bar{x}$=3.39) obtained the lowest score. As a result of the ANOVA test carried out to determine whether the instructors with different years of teaching experiences show a significant difference in terms of using ICT to understand learners, it was concluded that the difference between the groups was not statistically significant ($F_{(4-154)}$=1,68; p>.05). In other words, it was resolved that instructors with different years of teaching experiences were at a similar level in terms of the scores obtained in the area of using ICT to understand learners. In the second area of the scale, *Subject Content*, instructors with 6-10 years of experience have the highest score ($\bar{x}$=4.10), while instructors with 21 years and more experience ($\bar{x}$=3.78) have the lowest. As a result of the ANOVA test, carried out to determine whether the instructors with different years of teaching experience at the university show a significant difference in terms of using ICT to understand the *Subject Content*, it was concluded that the difference between the groups was not statistically significant ($F_{(4-154)}$=0,73; p>.05). To put it another way, it was ascertained that instructors with different years of teaching experience are at a similar level in terms of using ICT to understand the subject content. In the area of *Curriculum Design*, the third area of the scale, the highest score was acquired by instructors with 6-10 years of experience ($\bar{x}$=3.87), while the lowest score was by instructors with 21 years or more of experience ($\bar{x}$=3,56). As a result of the ANOVA test carried out to determine whether the instructors with different years of teaching experience at the university show a significant difference in terms of using ICT in *Curriculum Design*, it was concluded that the difference between the groups was not statistically significant ($F_{(4-154)}$=0,92; p>.05). In other words, instructors with different years of teaching experience were at a similar level in terms of using ICT in *Curriculum Design*. In the area of

Practical Teaching, the fourth area of the scale, the highest score was obtained by instructors with 6-10 years of experience ($\bar{x}$=3.90), while the lowest score was by instructors with 21 years or more of experience ($\bar{x}$=3, 71). As a result of the ANOVA test, it was seen that the difference between the groups was not statistically significant ($F_{(4-154)}$=0,84; p>.05). Instructors with different years of teaching experiences are at a similar level in terms of using ICT in *Practical Teaching*. In the fifth area of the scale, in the area of *Assessments*, the highest score was obtained by instructors with 11-15 years of experience ($\bar{x}$=3.54), while the lowest score was by instructors with 21 years or more of experience ($\bar{x}$=3.28). As a result of the ANOVA test conducted to determine whether the instructors with different years of teaching experiences at the university show a significant difference in terms of using ICT in assessing students, it was concluded that the difference between the groups was not statistically significant ($F_{(4-154)}$=0,44; p>.05). In other words, it was concluded that instructors with different years of teaching experiences were at a similar level in terms of using ICT to assess students. In addition, it was determined that the total scores obtained from the scale did not differ significantly according to the years of teaching experience ($F_{(4-154)}$=0,82; p>.05).

Discussion, Conclusion, and Suggestions

In this study, TPACK-Practical skill levels of Turkish in-service EFL instructors, and the relationships between their TPACK-Practical skill levels and the demographic variables discussed in the study were investigated. As stated in the findings, results indicated that EFL instructors generally use their TPACK-Practical skills in classroom applications at a *"sufficient"* level. When the total scores from the TPACK-Practical scale were taken into account, the participants' scores ranged between 1,09 and 4,91. The arithmetic mean of total scores was calculated as 3.70 ($\bar{x}$=3,70) and its standard deviation was found to be 0.70. The central tendency measures related to the scores acquired from the scale had a median (3.72) and a mode (3.68) that were relatively close to one another. Accordingly, it has been demonstrated that the scores from the TPACK-Practical scale and its pedagogical areas have a normal distribution, and that parametric analysis techniques should be employed to test any differences in the demographic variables identified within the study's scope. The findings of the study are congruent with the findings of some previous studies which report that English language teachers are generally competent in using their TPACK in classroom practices (Malik et al., 2019; Pangket, 2022).

When the data is combined, it can be concluded that EFL instructors use ICT at the lowest level in the *Assessments* area and at the highest level in the *Subject Content* area. This finding could be taken to mean that EFL intsructors consider themselves the most skilled users of ICT in their subject content in English language. The finding that *Subject Content* is the area where instructors use technology at the highest level agrees with the findings of Alqurashi and Samarin (2015) which revealed that English language teachers' knowledge of technology use lagged behind their knowledge of pedagogy and subject content. It might also indicate an assumption that after many years of teaching, teachers gain confidence in their background knowledge of pedagogy and the content they naturally become accustomed to. The finding that *Assessments* is the area where instructors use technology at the lowest level supports Mirici and Demirbaş's (2013) assertion that policymakers and universities as practitioners should take action to create and develop alternative types of assessment in language teacher education in order to change the attitude toward assessment, regardless of how time-consuming or challenging it may be to try alternative assessment.

As stated in the findings, the level of ICT used by the instructors in *Curriculum Design* was found to be between 3.40 and 4.19, which was considered to be *"sufficient"* based on this result. This demonstrates that instructors tend to use ICT when creating digital materials, keeping in mind the goals and common reference levels established by the CEFR, an internationally recognized framework that serves as the foundation for current English Language Teaching practices, as suggested by Mirici and Kavaklı (2017). It could also indicate that teachers are taking on new responsibilities as curriculum designers and are now tasked with incorporating rapidly advancing technology into their lessons.

After revealing the TPACK-Practical skill levels of the participants, the present study also intended to explain the relationships between their TPACK-Practical skill levels and the demographic variables covered in the study. Contrary to expectations, no significant differences were observed between these

variables. The relation between the age variable and the scale scores was negative, or, in other words, that age has no significant effect on the scale scores. This result differs a little from the common belief that younger teachers will typically possess more technological knowledge. However, this finding of the study is compatible with the findings of another study which revealed that age made no significant difference to the knowledges of participants (Hsu, & Chen, 2018). Future studies might be needed to widen the age gap to diversify the ages of the participants, which could lead to different results.

The statististical analysis for the relationship between the gender variable and the scale scores revealed no significant relationship between these variables. The analyses were conducted on 154 participants because one participant did not make any mark on the gender variable. The participants of the study consisted of 104 male and 50 female Turkish in-service EFL teachers from various universities in Turkey. Although male instructors ($\bar{x}$=3.75) scored higher on the TPACK-Practical Scale than their female counterparts ($\bar{x}$=3.60), the difference was considered statistically insignificant ($t_{(152)=}$1.27; p>.05). The study's findings are in line with some other studies in the literature (Cai et al., 2017; Sariçoban et al., 2019). Cai et al. (2017) examined gender and attitudes toward technology use and identified a total of 50 articles from 1997 to 2014 to be used in their meta-analysis. The results of these studies indicated that no statistically significant difference was observed between gender and technology usage although males in general tend to have more positive attitudes and self-confidence toward technology use. The researchers of these studies conclude that the difference resulting from gender is no longer significant due to the more widespread use of ICT by nearly every member of society.

It was found that there was no significant difference between the total scores on the scale and the level of education ($F_{(2\text{-}154)}$=2,25; p>.05). However, instructors with PhD degrees used ICT in the *Assessments* area noticeably more often than instructors with master's degrees. This does not support the widely held belief that the quality of a teacher is significantly influenced by their level of education. This result also conflicts with a study by Mailizar et al. (2021) that examined the impact of demographic factors on teachers' TPACK and found that teachers' level of education significantly influences their TPACK. It revealed that teachers with higher education levels have TPACK that is noticeably higher than teachers with lower education levels.

The instructors from different majors of study at the university had similar levels of proficiency in using ICT in all areas. In other words, the difference between the total scores on the scale and major of study at the university was insignificant ($F_{(2\text{-}154)}$=2,25; p>.05). When it comes to the relationship between the type of working institution variable and the scale scores, instructors working at private universities ($\bar{x}$=3.86) had higher scores than instructors working at state universities ($\bar{x}$=3.68); however, this difference was not statistically significant ($t_{(152)}$=1,06; p>.05). According to this result, it was determined that the variable of the type of working institution did not cause a significant difference in the TPACK-Practical Scale used in the study and the areas of the scale.

With reference to the relationship between the years of teaching experience variable and the scale scores, it was determined that the total scores obtained from the scale did not differ significantly according to the years of teaching experience ($F_{(4\text{-}154)}$=0,82; p>.05). This result is consistent with those of a different study that found no appreciable differences between teachers' TPACK and levels of teaching experience (Mailizar et al., 2021). It also backs up the findings of another study by Pittman and Gaines (2015), who discovered that factors like age, level of education, and years of teaching experience had little impact on how much technology was used in the classroom. This result of the present study, however, contradicts earlier findings that level of teaching experience might play a critical role in teachers' TPACK (Hsu et al., 2017; Nazari et al., 2019; Hsu et al., 2021).

Based on the findings of the current study, it can be concluded that EFL instructors generally use their TPACK-Practical skills in classroom applications at a *"sufficient"* level (at the lowest level in the *Assessments* area and at the highest level in the *Subject Content* area), and that demographic variables have no significant effect on their technology integration skills. For further studies, direct observational data collected by the researchers themselves and interview data supported with the quantitative data, which have rarely been mentioned in TPACK studies, could be helpful in more

precisely determining the level of TPACK among teachers and the fairness of their choices on how to use technology in their teaching implementations.

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Ethics statement: In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.

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