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Institute of Educational Sciences
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**EXAMINING EFL INSTRUCTORS' TECHNOLOGICAL
PEDAGOGICAL CONTENT KNOWLEDGE LEVELS AND
PERCEPTIONS AT THE TERTIARY LEVEL IN TÜRKİYE**

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A Master's Thesis**

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**TÜRKİYE'DE YÜKSEKÖĞRETİM DÜZEYİNDE İNGİLİZCE
ÖĞRETİM GÖREVLİLERİNİN TEKNOLOJİK PEDAGOJİK ALAN
BİLGİSİ DÜZEYLERİNİN VE ALGILARININ İNCELENMESİ**

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Fatih Mehmet YİĞİT

Tarih

İmza



To my beloved wife

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**Türkiye'de Yükseköğretim Düzeyinde İngilizce Öğretim Görevlilerinin
Teknolojik Pedagojik Alan Bilgisi Düzeylerinin ve Algılarının İncelenmesi
(Yüksek Lisans Tezi)**

Fatih Mehmet YİĞİT

ÖZ

Günlük hayatımızdaki neredeyse her şeyin hızlı gelişmeler sayesinde farklı boyutlara evrilme eğiliminde olduğu bir çağda yaşarken, teknolojinin de bir istisna olmadığını varsaymak muhtemelen güvenli olacaktır. Bu nedenle, İngilizce öğretim görevlilerinin sadece bu bilgi türlerinde yetkin olmaları değil, aynı zamanda teknolojik, pedagojik ve alan bilgisini öğretim uygulamalarına entegre edebilmeleri beklenmektedir. Eğitimde teknoloji entegrasyonu, üniversite düzeyinde Yabancı Dil Olarak İngilizce (YDOİ) öğretiminde de önemli bir ivme kazanmaktadır. Bu çalışma, Türkiye'deki bir devlet üniversitesinde çalışmakta olan İngilizce öğretim görevlilerinin Teknolojik Pedagojik Alan Bilgisi (TPAB) düzeylerine yönelik algılarını incelemektedir. Sıralı karma yöntem araştırma tasarımını kullanan çalışma, ilk olarak 47 öğretim görevlisinden YDOİ-TPAB anketi aracılığıyla nicel veriler toplamış, ardından 16 katılımcıyla yarı yapılandırılmış görüşmeler yoluyla nitel veriler elde etmiştir. Nicel analiz, öğretim görevlilerinin yüksek düzeyde Alan Bilgisi (AB) ve Pedagojik Alan Bilgisi (PAB) algısına sahip olduğunu, ancak nispeten daha düşük düzeyde Teknolojik Pedagojik Bilgisi (TPB) algısına sahip olduğunu ortaya koymuştur. TPAB düzeylerinde, öğretim deneyimine bağlı olarak önemli farklılıklar bulunmuş, daha yeni öğretim görevlilerinin daha yüksek teknolojik yeterlilik sergilediği görülmüştür. Nitel bulgular, YDOİ öğretiminde teknoloji entegrasyonunu iyileştirmek için sürekli mesleki gelişim ve hedefli eğitime duyulan güçlü ihtiyacı göstererek daha derinlemesine bilgiler sunmuştur. Katılımcılar, teknolojik araçları pedagojik stratejiler ve alan sunumu ile dengelemekte zorlandıklarını ifade etmişlerdir. Ayrıca, kurumsal desteğin ve kaynaklara erişimin önemini vurgulamışlardır. Bu araştırma, Türkiye'de bir devlet üniversitesinde çalışmakta olan İngilizce öğretim görevlilerinin karşılaştıkları özel ihtiyaçlar ve zorluklar hakkında kapsamlı bir anlayış sağlayarak TPAB ile ilgili alanyazına katkıda bulunmaktadır. Çalışma, teknolojik bilgi açığını kapatmak ve genel öğretim etkinliğini artırmak için özelleştirilmiş mesleki gelişim programlarına duyulan ihtiyacı vurgulamaktadır. Bulguların ve çıkarımların tartışılmasına dayanarak çalışma, gelecekteki araştırma çalışmaları için çeşitli ve sağlam örneklem tekniklerinin kullanılması, daha büyük bir örneklem büyüklüğünün hedeflenmesi, eksik veri sorunlarının ele alınması, birden fazla görüşmecinin kullanılması ve görüşme tekniklerinde kapsamlı eğitim ve standartlaşmanın sağlanması gibi öneriler sunmaktadır.

Anahtar Kelimeler: Algılar, İngilizce Öğretim Görevlileri, Mesleki Gelişim, TPAB, Teknoloji Entegrasyonu, Yabancı Dil Olarak İngilizce Öğretimi.

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**Examining Efl Instructors' Technological Pedagogical Content Knowledge
Levels and Perceptions at the Tertiary Level in Türkiye
(Master's Thesis)**

Fatih Mehmet YİĞİT

ABSTRACT

Living in an era where almost everything in our daily lives tends to evolve into different dimensions thanks to rapid advancements, it would probably be safe to assume that technology is no exception. EFL Instructors are therefore expected not only to be competent in these forms of knowledge but also to be able to integrate technological, pedagogical, and content knowledge into their teaching practices. Technology integration in education is also gaining considerable momentum in English as a Foreign Language (EFL) teaching at the university level. This study investigates the perceptions of in-service EFL instructors towards Technological Pedagogical Content Knowledge (TPACK) levels at a state university in Türkiye. Utilising a sequential mixed methods research design, the study first gathered quantitative data through the EFL-TPACK questionnaire from 47 instructors, followed by qualitative data through semi-structured interviews with 16 participants. Quantitative analysis revealed that instructors have perceptions of high levels of Content Knowledge (CK) and Pedagogical Content Knowledge (PCK) but comparatively lower levels of Technological Pedagogical Knowledge (TPK). Significant differences in TPACK levels were found based upon teaching experience, with newer instructors displaying higher technological competence. Qualitative findings offered deeper insights, indicating a strong need for continuous professional development and targeted training to improve technology integration in EFL teaching. Participants expressed challenges in balancing technological tools with pedagogical strategies and content delivery. They also emphasised the importance of institutional support and access to resources. This research contributes to the growing body of literature on TPACK by providing a thorough understanding of the specific needs and challenges encountered by in-service EFL instructors at a state university in Türkiye. The study underlines the need for customised professional development programs to bridge the gap in technological knowledge and improve overall instructional effectiveness in EFL contexts. Based upon the discussion of findings and implications, it offers recommendations such as employing diverse and robust sampling techniques, aiming for a larger sample size, addressing missing data issues, using multiple interviewers, and ensuring thorough training and standardisation in interviewing techniques for future research studies.

Key words: EFL Teaching, EFL Instructors, Perceptions, Professional Development, Technology Integration, TPACK.

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LIST OF ABBREVIATIONS

ANOVA	: Analysis of Variance
BUUSFL	: Bursa Uludağ University School of Foreign Languages
EFL	: English as a Foreign Language
EFL-TPACK	: English as a Foreign Language-Technological Pedagogical Content Knowledge
ELT	: English Language Teaching
MAKU	: Mehmet Akif Ersoy University
MoNE	: Ministry of National Education
CK	: Content Knowledge
PK	: Pedagogical Knowledge
TK	: Technological Knowledge
PCK	: Pedagogical Content Knowledge
TCK	: Technological Content Knowledge
TPK	: Technological Pedagogical Knowledge
TPACK	: Technological Pedagogical Content Knowledge

CHAPTER I

INTRODUCTION

This chapter consists of seven subsections. To begin with, the background to the study is comprehensively presented. Secondly, the statement of the problem is described in brief. Then, the purpose of the study is specified. The next section refers to the research questions of the study. Followingly, the significance of the study is specifically addressed. The following two sections include the assumptions and limitations of the study. The introduction concludes with a brief definition of key concepts.

1.1. Background to the Study

Technology can be best described as all machines, techniques, processes, management, and control mechanisms, thereby serving as a bridge between science and practice regarding a wide range of areas such as production, transportation, education and so forth. Living in an era where almost everything about our daily lives tends to evolve into different dimensions thanks to rapid advancements, it would probably be safe to assume that technology is no exception. Being quite influential in the field of education, this era can be referred to as the twenty-first century where technology integration plays a significant role in shaping our education reforms. It seems evident that there have been remarkable developments in information and communication technologies during the last few decades; therefore, the integration of technology into education appropriately has gradually become high on the agenda of all stakeholders in education (Stern, 1991; Vrasidas & Mcisaac, 2001). As Zengin and Aksu (2017) suggest in a similar vein, recent technological developments and innovations have had a tremendous impact upon almost every aspect of our everyday lives and have profoundly altered teaching and learning in education. In addition, educational technologies have dramatically shifted away from standard technology into advanced technology (Yilmaz, 2015). As recent years have seen significant advances in digital technology use in education, particularly language instruction, at a breath-taking pace and in a widely accessible manner, it would be appropriate to think technological developments, teachers' pedagogical competence and advancements in

their subject-matter expertise are essentially complementary aspects in the education (Ergen et al., 2019). In accordance with what İşler and Yıldırım (2018) propose, it would be reasonable to assume that successful technology integration in education is based not only on the proper technical instruments but also on teachers' effective usage of these technological tools. Furthermore, with the advent of new advanced technologies into the classroom in the twenty-first century, it has also become absolutely essential for all those involved in teacher education programs to provide teachers with appropriate knowledge and skills to incorporate technology into their teaching (Kurt et al., 2014). In line with what Koehler and Mishra (2009) also propose, teachers are therefore expected not only to be competent in these forms of knowledge but also to be able to integrate technological, pedagogical, and content knowledge (TPACK) (Schmidt et al., 2009). Last but not least, effective technology implementation in EFL settings means that teachers must have a combination of three knowledge components, namely technology, pedagogy, and content, in order to have TPACK (Aniq & Draji, 2019; Mouza, Nandakumar, Yilmaz Ozden, & Karchmer-Klein, 2017).

1.2. The Statement of the Problem

Technology use in educational contexts has grown exponentially in line with the rapid advancements all over the globe in recent years. Assuming that being able to integrate technology into the classroom properly and effectively is of significant importance, teachers need to make sure they attain fundamental skills to integrate their knowledge of content, pedagogy, and technology, promote both teaching and learning and keep up with the recent technological advancements accordingly (Pilgrim & Martinez, 2015). Much of the research conducted thus far aimed at either exploring pre-service EFL teachers' TPACK competency or designing an assessment criterion for TPACK of pre-service or in-service EFL teachers. For instance, Sarıçoban, Tosuncuoglu, and Kırmızı (2019) explored that although pre-service EFL teachers have an acceptable degree of proficiency in technological pedagogical content knowledge, there are several areas where they need to improve. In another study, İşler and Yıldırım (2018) suggested that EFL teachers had high levels of perceived TPACK competence and highlighted the importance of personal interest, experience, knowledge, and access

while emphasising academic support for the development of TPACK from their own instructors. Additionally, there have been some studies regarding the perceived TPACK of in-service EFL teachers, most of whose participants tend to be MoNE teachers and/or university instructors. For instance, a case study conducted by Canbay (2020) revealed that foundation secondary school teachers who were provided with in-service training support were enthusiastic about incorporating technology into their language teaching practices. Another case study by Önalın and Kurt (2020) indicated that EFL instructors favoured incorporating technology in their teaching and displayed a high degree of self-confidence in implementing technology into their teaching.

With these in mind, investigating in-service EFL instructors is worth conducting research as there is a dearth of related studies in the literature regarding their perceptions of TPACK levels. Therefore, this study builds upon the TPACK framework (Koehler & Mishra, 2009) and aims at investigating the technological pedagogical content knowledge levels of in-service instructors and their perceptions in tertiary-level EFL classrooms.

1.3. The Purpose of the Study

Drawing upon a review of literature that indicates a growing interest among teachers and teacher educators regarding TPACK since its introduction to educational contexts, there is a considerable demand for such a framework that enables and integrates technology into their instruction in the light of technological advancements in teacher education (Baser et al., 2016). Given this brief background, the current study aims to gain an insight into the TPACK levels of in-service instructors in tertiary-level EFL classrooms by utilising the TPACK framework, which acts as a *conceptual lens* to examine educational technology, emphasising key aspects and highlighting significant issues while ignoring irrelevant ones (Koehler, Shin & Mishra, 2012). It also integrates qualitative data within the scope of mixed methods research, thereby providing an insider perspective on the current study and yielding more valuable, richer data than a single data could offer (Creswell & Plano Clark, 2018).

1.4. The Significance of the Study

Living in the twenty-first century, in which ever-growing advancements in academia and technology integration into the classrooms play a crucial role in advancing the quality of effective teaching, technological tools present a tremendous opportunity for instructors since they are becoming key components of the current classroom environment (Saraç, 2015). With this aspect in mind, TPACK assumes a pivotal role in teaching content and pedagogy via technology.

Despite the fact that most TPACK studies in Türkiye and abroad tend to focus upon pre-service teachers (e.g., Çakmak & Gündüz, 2018; Hana, 2020; Hsu, 2016; İşler & Yıldırım, 2018; Kozikoğlu & Babacan, 2019; Kurt et al., 2014; Külekçi, 2018; Kesen Mutlu & Özkan, 2017; Özer et al., 2019; Sarıçoban et al., 2019; Tondeur et al., 2016; Tondeur et al., 2019), considerable attention is also directed towards a growing body of literature investigating the views of in-service teachers (e.g., Bas & Senturk, 2018; Canbay, 2020; Çebi, 2018; Essam, 2021; Kassem, 2018; Kayacan Köse, 2016; Nazari et al., 2019; Önalın & Kurt, 2020; Raygan & Moradkhani, 2020). There is also a relatively small body of literature concerned with comparative studies (e.g., Alnujaidi, 2021; Turgut, 2017b).

The current study is significant because it provides valuable insights into the integration of technology in education, particularly in EFL teaching context. It addresses the professional development needs of instructors, contributes to the empirical validation of the TPACK framework, and has the potential to inform educational policy and practice. Through its mixed methods approach, it offers a comprehensive understanding of the TPACK levels of instructors, which is fundamental to the successful use of technology in language education. Another significant aspect regarding this study is that it might be among few studies based upon a questionnaire developed specifically for EFL context. In this regard, the study aims to contribute to the growing literature on TPACK research by offering academia a fresh perspective on EFL instructors' TPACK levels and their perceptions towards technology integration.

1.5. Assumptions

The current study builds on the following assumptions. Firstly, it is anticipated that EFL instructors having higher levels of TPACK will likely display more effective teaching practices. This assumption is based on the idea that technological developments may improve educational outcomes when properly merged with content knowledge and pedagogical methods. Secondly, it is expected that the TPACK levels among EFL instructors will show significant variation. This variation could be influenced by factors such as the instructors' prior experience with technology, their training in technology integration into pedagogy, and their comfort level with using digital tools in their classroom practices. Furthermore, it is assumed that EFL instructors having received thorough professional development programs specifically focused on technology integration will probably have higher TPACK levels compared to those who have not. This assumption is grounded on the premise that targeted training may improve teachers' competency in using technology for educational purposes. Additionally, it is assumed that EFL instructors will possibly report diverse challenges in incorporating technology into their pedagogical practices. These challenges might include a lack of resources, insufficient training, resistance to change, or issues integrating technology into pedagogical goals. Moreover, it is anticipated that the qualitative data gathered through semi-structured interviews will likely offer further perspectives and context for the quantitative survey results. This mixed-method approach is expected to provide detailed insights into EFL instructors' experiences and perceptions towards TPACK. It is also assumed that technological developments and the growing focus on digital literacy will probably lead to an evolution in teaching practices. EFL instructors are expected to gradually embrace more technology-focused practices in their classrooms, driven by both institutional policies and personal motivation to promote student engagement and learning outcomes. In addition, it is expected that there will possibly be a recognised need for ongoing training and professional development to keep track of rapid technological developments. EFL instructors are expected to emphasise a need for continuous learning opportunities to follow the latest advancements in educational technologies and integrate them effectively into their teaching practices. Finally, it is anticipated that institutional support, including access to resources and administrative support, will probably be a

crucial aspect impacting the effective implementation of technology in foreign language education. EFL instructors are likely to underline the significance of a supportive environment for the effective and proper implementation of TPACK principles.

1.6. Limitations

Although the current study attempts to offer a significant contribution to the relevant literature, there are some limitations that need further consideration. One of the limitations of this study was that the quantitative findings were limited to the perceived technological pedagogical content knowledge of the participating in-service instructors in tertiary-level EFL classrooms. Another main limitation of the study was that the researcher was able to reach a sample of 47 in-service English instructors at the School of Foreign Languages at Uludağ University despite having made efforts to reach out to a larger pool of respondents during the quantitative data collection through the TPACK questionnaire. Besides, participants for the qualitative interviews were volunteers from the initial questionnaire. This self-selection could introduce bias, as those who volunteered may have different perspectives or greater interest in TPACK compared to those who did not volunteer, which could affect the representativeness of the qualitative findings. Moreover, this study utilised a single level sampling approach, focusing on individual instructors. A multi-level mixed methods sampling strategy, incorporating individual, departmental, and institutional levels, was not employed. The responses gathered from three participants had to be excluded from the study as they had failed to fill in the demographic information of their questionnaire during the quantitative data collection process, which could have been valuable for further comparison purposes. Additionally, the qualitative data collection process was limited to only 16 instructors who volunteered for semi-structured interviews. Thus, this may limit the generalisations of the findings. A further limitation of the current study was that the study may not fully capture the diversity of EFL instructors' experiences across different geographic locations or institutional contexts. Finally, the study focused on EFL instructors' perceptions of TPACK. However, classroom practices or practical aspects of teaching were not considered.

1.7. Definition of Key Concepts

BUUSFL refers to Bursa Uludağ University School of Foreign Languages (BUUSFL Preparatory Program Design Model, 2021).

EFL stands for English as a Foreign Language. It refers to “the study of English by nonnative speakers living in a non-English-speaking environment” (Collins Dictionary, n.d.).

ELT is an abbreviation for English Language Teaching. It can be defined as “the teaching of English to people for whom it is not the first language” (Oxford Advanced Learner’s Dictionary, n.d.).

MoNE refers to Ministry of Education (Republic of Türkiye Ministry of National Education, n.d.). (T.C. Millî Eğitim Bakanlığı, n.d.)

CK stands for Content Knowledge. It refers to “teachers’ knowledge about the subject matter to be learned or taught” (Koehler & Mishra, 2009, p. 63).

PK is a short expression for Pedagogical Knowledge. It refers to “deep knowledge about the processes and practices or methods of teaching and learning” (Mishra & Koehler, 2008, p. 6). This term includes general instructional goals, beliefs, and objectives.

TK is an abbreviation standing for Technology Knowledge. It refers to “a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving than the traditional definition of computer literacy” (Koehler & Mishra, 2009, p. 64). It means carrying out a number of tasks by utilizing information technology and developing alternative methods of accomplishing a particular task.

PCK, an overlap between pedagogy and content, stands for Pedagogical Content Knowledge. It symbolises “the blending of content and pedagogy into an understanding of how particular aspects of subject matter are organized, adapted, and represented for instruction” (Koehler & Mishra, 2006, p. 1021).

TCK, a mutual interplay between technology and content, is a short expression for Technological Content Knowledge. It refers to a theoretical framework defined by an

emphasis on the entire overlap between technology and content (Koehler et al., 2014, as cited in J.M. Spector et al., 2014).

TPK, another overlap between technology and pedagogy, stands for Technological Pedagogical Knowledge. It can be described as “a deeper understanding of the affordances of technology and how they can be leveraged differently according to changes in pedagogical context and purposes” (Koehler & Mishra, 2009, pp. 65-66).

TPACK stands for Technological Pedagogical Content Knowledge. It is a conceptual framework that encompasses all relevant core components based upon the “understanding that emerges from interactions among content, pedagogy, and technology knowledge” (Koehler & Mishra, 2009, p. 66). This framework refers to the understanding of the elaborate interplay between technology, pedagogy, and content that allows instructors to establish effective and situational pedagogical practices (Koehler et al., 2014, as cited in J.M. Spector et al., 2014). It also outlines the types of knowledge that are essential for teachers towards effective technology integration in the classroom (Mishra, 2019).

CHAPTER II

LITERATURE REVIEW

This chapter consists of five sections and relevant subsections through which the literature review provides a comprehensive framework and background regarding core concepts and theoretical underpinnings of the related study. The first section briefly outlines the relevant literature on language teaching and technology. The second and third sections attempt to contextualise the research by defining TPACK and its core components and illustrating the interplay among them. The fourth section seeks to emphasise the significance of TPACK in English language teaching. Finally, the chapter concludes with a review of related studies on TPACK in broad terms.

2.1. Language Teaching and Technology

Technology use has been a fundamental part of education in today's rapidly evolving and expanding world. Technology can be described as the implementation of scientific innovations and advancements in order to be able to solve technical issues and provide assistance in daily life. On a broader perspective, the term is a comprehensive concept including all economic and social processes and organisations that attempt to achieve technological knowledge. It would be right to consider technology use and education as complementary concepts that directly interact with each other. As Şahin (2011) suggests, technology seems to have become an essential part of our everyday life, and technological advances can offer a wide range of novelties for instructors and classes due to rapid technological advances and the growing use of digitalisation.

Technology has also been a significant aspect utilised for a remarkably long time in language education. It has incorporated such a wide range of preliminary devices as televisions, video resources, phonographs, cassettes, tape recorders, and overhead projectors. Then, it has evolved into a growing body of web and multimedia technologies ranging from videos, conferencing tools, animations, and computer games to social networking platforms, such as Facebook, Instagram, Twitter and so on. However, educational technologies have been expanding and evolving rapidly in

teaching and learning due to rapid advancements in technology (Mittal, 2015; Richards, 2015). There have also been numerous online learning management systems such as Google Classroom, Macmillan Education Everywhere, Oxford Learner's Bookshelf for educational purposes and online teaching tools, including Zoom, Google Meet, Microsoft Teams, and so forth.

That being said, it would be appropriate to conclude that technology usage and integration in language education seems to have been quite varied, ranging from early available and limited resources to relatively contemporary technologies, one of which can be referred to as TPACK. Therefore, teachers must comprehend the interplay between technology and content, the use of technology to assist particular subject area learning and pedagogy, the role of distinct pedagogies in promoting technology use, and their contribution to learner engagement with content in various ways (Polly et al., 2010).

Within this context, the next section attempts to explore a framework, widely known as TPACK, that clarifies the integration of technology, content, and pedagogy in broad terms and EFL teaching in particular.

2.2. TPACK Framework

It was back in the mid-1980s that Shulman (1986) raised a concern stating that there was a considerable emphasis upon teaching techniques at the expense of content, and thereby emphasised a significant gap in teacher education. Although pedagogical knowledge gradually rose to prominence subsequently, neither the content knowledge nor pedagogical knowledge managed to entirely address the *missing paradigm* that Shulman mentioned.

However, with the rapid evolution of technology and its significant influence upon almost every aspect of everyday life, where the educational industry is no exception, understanding why, how, and how much technology should be incorporated into classes for efficient teaching and learning is crucial for ever-growing nature of the teaching profession. Since education is sophisticated and complex, it is expected that teachers should offer elaborate instruction in multiple cases and manners (Mishra & Koehler, 2006).

In this sense, Koehler and Mishra were the very first scholars who established a framework produced by the integration of the TK into the PCK introduced by Shulman in 1986 (Koehler & Mishra, 2005, 2006). Coined as Technological Pedagogical Content Knowledge, the framework introduces a type of knowledge that stands above all the other three key components: technological knowledge, pedagogical knowledge, and content knowledge, which “not only represents the intersections of pedagogy, technology and content knowledge with each other but also their interactions with one other” (Mutluoğlu & Erdoğan, 2016).

2.3. TPACK Components

TPACK framework includes three core components that are *technological knowledge*, *pedagogical knowledge*, and *content knowledge*. Integrating these core components brings forth three additional sub-components such as *technological content knowledge*, *pedagogical content knowledge*, and *technological pedagogical knowledge*. It is, therefore, the amalgamation of these three subcomponents that constitutes *technological pedagogical and content knowledge* (Schmid, Brianza, & Petko, 2020).

Considering this brief background information, the figure below illustrates the TPACK framework and its knowledge components (Koehler & Mishra, 2009, p. 63).

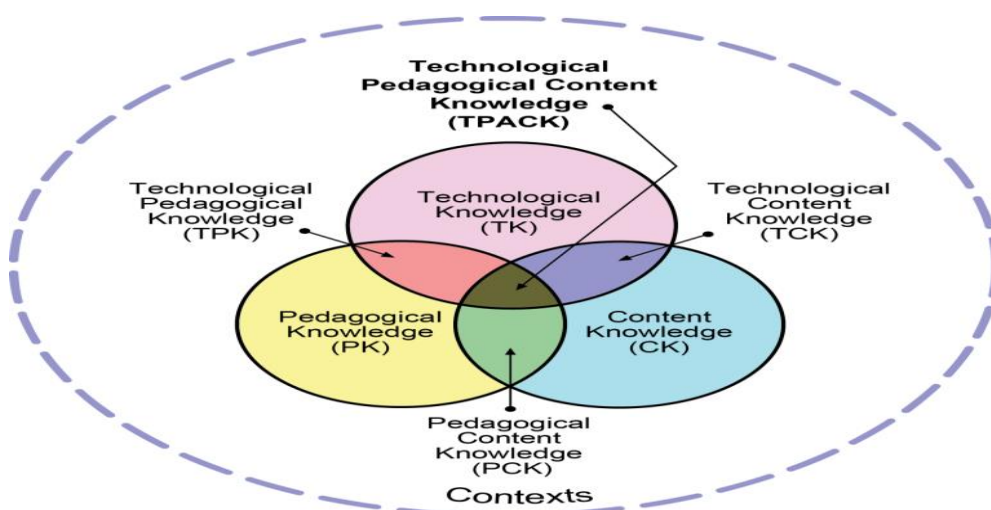


Figure 1. Technological Pedagogical Content Knowledge TPACK and its core components (Koehler & Mishra, 2009)

2.3.1. Content knowledge. Being the first component of TPACK, content knowledge (CK) refers to teachers' individual knowledge of the underlying subject area that is to be taught (Mishra & Koehler, 2006). This specific component includes “knowledge of concepts, theories, ideas, organisational frameworks, knowledge of evidence and proof, as well as established practices and approaches towards developing such knowledge” (Mishra & Koehler, 2008, p. 13). It is essential for teachers to hold an appropriate level of competency and get a good grasp of their subject matter. In other words, language teachers should be acquainted with linguistic structures and functions as well as ideas and processes regarding the target language.

2.3.2. Pedagogical knowledge. Pedagogical knowledge can be described as the competence of a teacher to employ pedagogical practices in classes while delivering the topic. Encompassing entire educational principles and beliefs, PK refers to a detailed knowledge of teachers regarding knowledge, practices, processes of teaching and learning procedures. According to Koehler and Mishra (2005), this component highlights the competencies offered by the teaching profession and incorporates an understanding of planning, implementing, and assessing, and it handles teaching in accordance with the learning profiles of students. Since competency in PK involves being aware and employing teaching and learning methods appropriately, it is necessary for teachers to be able to know their students and adopt relevant approaches and tactics in accordance with their characteristics and arrange teaching-learning processes in this regard. In this sense, it seems fundamental that teachers require proper pedagogical knowledge in an effort to transmit their content knowledge (Avci, 2014).

2.3.3. Technological knowledge. The third component of TPACK refers to technological knowledge. It pertains to understanding how to utilise technology within any context of education.

Koehler and Mishra (2009, p. 64) provide a clear and concise definition of TK as “a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem-solving than does the traditional

definition of computer literacy”. As the name suggests, it incorporates digital technologies, which are particularly concerned with the use of information and communications technologies (Yurdakul, 2018). With the rapid evolution of technology, TK stands far more dynamic than the other two core components, or more precisely PK and CK within the TPACK framework. This implies that the teachers’ capacity to understand modern technologies and their technology adaptation is heavily dependent upon their keeping abreast of all the latest developments related to technological devices, tools and learning equipment in educational settings.

2.3.4. Pedagogical content knowledge. Another essential and crucial component of the TPACK framework is pedagogical content knowledge, which emerged as a result of the interplay between pedagogy and content for effective teaching. This component involves understanding what teaching methodologies are appropriate for the content, as well as how parts of that content may be suited for effective teaching. Therefore, it is of fundamental importance for teachers to have a thorough knowledge of various PCK approaches, forms, and concepts by carrying out a great deal of research and having years of experience. Since teachers are expected to be knowledgeable about following strategies on the assumption that they may notice students' misconceptions on a certain issue from their a priori learning, those having PCK will be efficient in demolishing pre-existing misunderstandings, resolving student concerns, and fostering relevant learning (Mishra & Koehler, 2006).

2.3.5. Technological content knowledge. Another variable of TPACK is the interconnection between technology and content. According to Mishra and Koehler (2008), TCK refers to “an understanding of the manner in which technology and content influence and constrain one another” (p. 7). In this regard, knowledge of these advances in the specific field may assist teachers in understanding, selecting, and utilising appropriate technological tools effectively to fulfil goals and satisfy educational requirements (Mishra & Koehler, 2006).

2.3.6. Technological pedagogical knowledge. The last sub-component of TPACK is technological pedagogical knowledge, which is broadly defined by Koehler and Mishra (2009) as “an understanding of how teaching and learning can change when particular technologies are used in particular ways” (p. 65). This type of knowledge is described as having the instruments that can be employed for a specific purpose, selecting these tools according to their appropriateness, methods to utilise available tools and pedagogical approach knowledge and the potential to employ these strategies during technology use. Another definition that best describes TPK comes from Cox and Graham (2009), which can be referred to as the concept of utilising technology to explain instructional tasks to get students involved in collaborative activities and using various incentive technological tools to inspire students. Overall, it would be right to consider the term as knowledge of tools for maintaining class records, attendance, and grading, as well as knowledge of generic technology-based ideas such as web quests, discussion boards and chat rooms (Mishra & Koehler, 2008).

2.3.7. Technological pedagogical content knowledge. TPACK can be described as the knowledge about the interconnections among technology, pedagogy, and content that allow teachers to build effective and context-dependent teaching strategies (Koehler et al., 2014, as cited in J.M. Spector et al., 2014). As Mishra (2019) puts it another way, The TPACK framework highlights the types of essential knowledge for teachers for effective incorporation of technology into education. Considering a further and broader explanation of TPACK, it would be particularly appropriate to provide a good summary of what Koehler and Mishra (2006) argue below:

Understanding the representation of concepts using technologies and pedagogical strategies that employ them in constructive ways to convey material are required for good teaching using technology. It also necessitates an understanding of what makes things difficult or easy to grasp, as well as how technology might aid in the resolution of some of the issues. It requires an understanding of students' past knowledge and epistemological ideas, as well as how technology may be utilised to expand on current knowledge and establish new epistemologies.

2.4. The Significance of TPACK in English Language Teaching

ELT is an abbreviation that stands for English Language Teaching and can be defined as “the teaching of English to people for whom it is not the first language” (Oxford Advanced Learner’s Dictionary, n.d.). As far as language education and teaching are concerned, the use of multiple technologies in accordance with course materials captures students' interest in relevant subject matter considerably, enhances their motivation towards the course and helps them to take pride in their work in the classroom. In this regard, the technology use currently seems to acquire much significance in ELT. The framework implies that instructors are required to possess fundamental knowledge and understanding of each component in TPACK with the purpose of integrating technology, pedagogy, and content into education (Koehler et al., 2014, as cited in J.M. Spector et al., 2014), it is therefore essential to comprehend the TPACK levels of English teachers and identify the factors having an effect upon this knowledge.

2.5. Previous Related Studies on TPACK

Technology integration in educational contexts has been a major focus of numerous research studies, and therefore, many studies have been conducted to contribute towards a comprehensive understanding of TPACK. A great deal of previous research studies into TPACK seem to have focused particularly on pre-service teachers in a broader sense. In addition, there has been a large and growing body of literature that investigates the TPACK of in-service teachers. There is also a relatively small body of literature that is concerned with studies on both contexts. With these in mind, this section attempts to provide a brief overview of TPACK-related studies conducted thus far under three subsections.

2.5.1. Research Studies on both pre-service and in-service teachers. There is a relatively small body of literature that is concerned with studies on both pre-service and in-service teachers.

One of the recent comparative studies conducted by Alnujaidi (2021) aimed to investigate 111 pre-service and 106 in-service EFL teachers' levels of knowledge in content, pedagogy, and technology in connection to their gender, internet access at school, and training in Saudi Arabia. The results of the study revealed that pre-service teachers scored better in TK, TCK, and TPK, whereas in-servicers scored higher on all seven sub-domains of TPACK. The study explored additional indicators that could point to the teachers' TPACK levels and concluded with a clear suggestion for teacher education programs to focus upon a significant need to concentrate on the relationships and interconnections between content, pedagogy, and technology.

Another recent research study primarily focusing upon both contexts belonged to Luik et al. (2019). The study attempted to investigate and compare in-service and pre-service teachers' perceptions of their content, pedagogical, and technological knowledge according to the TPACK framework in Estonia. Results from the study indicated that in-service Estonian teachers rated pedagogy knowledge as the highest, while pre-servicers regarded it as the lowest. The findings of the study also suggested that in-service Estonian teachers regarded TK as the lowest, whereas pre-servicers rated the highest. It was recommended that there should be an increase in cooperation between in-service and prospective teachers since pedagogical knowledge was largely gained through teaching experience and practical field knowledge.

It is also noteworthy that there is a comparative study that emerged from Türkiye regarding TPACK. As an exploratory study, Turgut (2017a) attempted to compare and contrast TPACK among 39 teacher candidates, 53 pre-service and 103 in-service EFL teachers at a state university in Türkiye. Quantitative and qualitative data analysis of the study revealed considerable differences among the participants. According to the findings, there was significant evidence that teacher candidates viewed self-efficacy as mainly relevant to their TK instead of TPACK as a whole. Furthermore, the study indicated that they had the highest self-perceived TPACK in several sub-domains despite not having attended any technology-related courses. The study concluded that significant attention should be placed upon the nature and prolongation of the practicum program.

Overall, the existing research on both pre-service and in-service teachers, though limited, offers valuable insights into their respective competencies in content, pedagogy, and technology. Alnujaidi (2021) found that pre-service EFL teachers in Saudi Arabia demonstrated stronger technological knowledge (TK, TCK, and TPK), while in-service teachers excelled across all TPACK sub-domains, suggesting a nuanced difference in strengths based on experience. Luik et al. (2019) highlighted similar themes in Estonia, noting that in-service teachers rated pedagogical knowledge highest, contrasting with pre-service teachers who rated it lowest, yet had superior technological knowledge. This points to the value of practical teaching experience in developing pedagogical skills. Turgut's (2017a) exploratory study from Türkiye further underscores these differences, showing significant variation in TPACK self-efficacy among teacher candidates, pre-service, and in-service teachers, with a notable emphasis on the importance of extended practicum programs for pre-service teachers. Taken together, these studies emphasise the gap in understanding how ongoing professional development and initial teacher education programs can be better tailored to balance these competencies across both pre-service and in-service teachers. By examining the dynamic interplay between content, pedagogy, and technology, they provide actionable recommendations for enhancing teacher training programs, ensuring that both pre-service and in-service teachers are equipped with a comprehensive and integrated TPACK framework. They also highlight the need for a focused approach to improving TPACK through practical experience and targeted training initiatives.

2.5.2. Research studies on pre-service teachers. Most of the literature regarding TPACK seems to be related to studies on pre-service teachers. One recent mixed-methods study conducted by Tondeur et al. (2020) investigated the efficacy of employed practices in 688 pre-service teachers in Belgium in terms of equipping them with TPACK.

The findings of the study showed a favourable association between synthesis of qualitative evidence strategies and TPACK, which meant that teachers highlighted the significance of benefiting from professionals as role models, focusing upon the

significance of technology in education, discovering how to utilise technology, collaborating with peers, supporting genuine technological experiences, and offering ongoing feedback.

Another mixed-methods research study carried out by Martin (2019) examined the perceptions of 30 Jamaican pre-service teachers regarding the influence of new coursework on their skills to incorporate ICT in their areas of expertise based upon the Technology Acceptance Model and TPACK model. The study revealed that the role of gender was significant in terms of pre-service teachers' perceived knowledge of ICT integration in their educational framework.

There are also research studies conducted on pre-service teachers in Türkiye. For instance, Sarıçoban et al. (2019) examined the TPACK of 77 pre-service EFL teachers intending to teach English as a foreign language. The quantitative study employing a survey technique concluded that there were several areas such as knowledge and expertise about digital tools where EFL pre-service teachers could improve, although they had an acceptable degree of proficiency in technological pedagogical content knowledge.

Another study carried out by İşler and Yıldırım (2018) aimed to explore the perceived knowledge of 94 Turkish pre-service EFL teachers regarding their TPACK levels and their attitudes towards the integration of technology into EFL classrooms. Conducted as a mixed-methods research, the study revealed that both quantitative and qualitative data findings suggested high levels of perceived TPACK competencies. The study also indicated the significance of self-interest, expertise, knowledge, and accessibility as well as educational assistance pre-service teachers had from their own lecturers in terms of TPACK development.

Similarly, Kurt et al. (2014) conducted a mixed-methods research in order to explore EFL pre-service teachers' TPACK development and investigate its impact upon their classroom practices. The study suggested that pre-service teachers recognised the significance of interconnections among content, pedagogy, and technology in their lesson plans and practices.

In short, the reviewed literature mainly focuses on the TPACK framework as applied to pre-service teachers. Tondeur et al. (2020) demonstrated that incorporating role

models and peer collaboration effectively enhances TPACK among Belgian pre-service teachers. Martin (2019) identified significant gender influences on Jamaican pre-service teachers' ICT integration skills. In Türkiye, Sarıçoban et al. (2019) and İşler and Yıldırım (2018) highlighted areas for improvement and the importance of lecturer support in TPACK development among EFL pre-service teachers. Kurt et al. (2014) reinforced the critical interplay between content, pedagogy, and technology in pre-service teachers' practices. Building on the findings, these studies underscore the multifaceted nature of TPACK development among pre-service teachers across different regions and educational contexts. They explore the specific challenges pre-service teachers have and strategies they adopt to integrate technology into their teaching practices. By examining the significant aspects that affect TPACK development in a new context, they contribute to the broader understanding of how to effectively prepare future instructors for the technologically rich classrooms of today and tomorrow.

2.5.3. Research studies on in-service teachers. There is also a growing body of literature that is relevant to studies focusing upon in-service teachers. One recent case study carried out by Essam (2021) aimed to investigate Egyptian EFL teachers' demands to incorporate technology in their classroom context and, therefore, reduce their technological reluctance by means of the TPACK framework. The results of the study demonstrated that teachers' perceptions of content knowledge were a primary factor in the number of interactions with the other support members. The study also found out that teachers needed support in terms of training courses, workshops, and/or informal methods to bridge the gaps in their knowledge levels.

Another case study conducted by Önalán and Kurt (2020) scrutinised the factors that were directly relevant to 70 Turkish EFL in-service teachers' technology integration strategies and examined their knowledge about digital skills, beliefs, self-confidence in technology integration into teaching, and their perceptions about educational context and assistance. Their findings revealed that teachers were mostly familiar with frequently used computer programs and displayed positive attitudes towards the

use of technologies in the classroom. The findings also highlighted their high degree of self-confidence level in incorporating technology into their teaching.

Similarly, Raygan and Moradkhani (2020) conducted a quantitative research study with 209 Iranian EFL teachers in order to analyse the interaction between TPACK, classroom environment, attitude, and effective technology integration in EFL teaching. The results suggested that there was a significant connection between TPACK levels of teachers, perception, and their use of technology. The study further concluded that TPACK and perception had a considerable effect upon technology integration.

Within a different context, Prasojo et al. (2020) sought to examine the effects of developing and assessing the intended survey instrument upon the perception of 573 Indonesian EFL in-service teachers regarding TPACK. The findings revealed that Indonesian in-service EFL teachers were deficient in technological knowledge, although they believed that they had a satisfactory degree of pedagogical knowledge.

A mixed-methods case study carried out by Canbay (2020) explored 9 EFL teachers' perceptions of integrating technology in English language teaching. The study found that the teachers had a favourable perception towards the integration of technology in language teaching and needed training support in terms of technology integration despite their belief that they were good enough in technology.

Alnajjar and Al-Jamal (2019) conducted a quantitative research study in which they examined 69 in-service English language teachers' perspectives on TPACK in classroom teaching in Jordan. The findings of the study revealed that there was a need for technological knowledge, pedagogical knowledge, and technological pedagogical and content knowledge.

Another study that focused upon in-service teachers was that of Kassem (2018), which attempted to investigate 164 Saudi Arabian university instructors' opinions and practises regarding the ideal technology use in various EFL contexts. Conducted as a mixed-methods research, the study attempted to study 164 Saudi Arabian university instructors' opinions and practises regarding the ideal technology use in various EFL contexts. The study highlighted the significance of enhancing the

technological competencies of instructors and offering relevant examples in terms of technology integration in language teaching.

In a similar vein, Çebi (2018) carried out a mixed-methods study that explored the perspectives of 171 in-service language teachers towards technology integration in language education and analysed the elements that contribute positively and negatively. The study revealed that teachers indicated a favourable perception towards integrating technology in language education and emphasised that simply having relevant information, capabilities, capacity, and perception would not ensure an effective technology in language education in case of restricted access to resources.

Additionally, Cahyono, Kurnianti, and Mutiaraningrum (2016) examined how TPACK-oriented practice teaching courses helped 20 Indonesian EFL teachers enhance the effectiveness of their EFL instructional designs and pedagogical skills. The findings of the study suggested that teachers gained tremendously from the TPACK-based teaching practice course, satisfactorily developed instructional designs, and accomplished their classroom practices by adopting the TPACK framework.

Last but not least, Köse (2016) conducted mixed-methods research into the opinions of 127 English language instructors regarding TPACK at state universities in Türkiye. The findings indicated that the most proficient area where instructors placed themselves was their content knowledge, whereas they were not remarkably skilful in terms of using technology integration in accordance with their content knowledge with strong pedagogy.

In summary, the literature on in-service EFL teachers' technology integration reveals several important trends. Across various contexts, including Egypt, Türkiye, Iran, Indonesia, Jordan, and Saudi Arabia, studies consistently highlight the importance of technological knowledge and skills for effective classroom integration. While many teachers demonstrate positive attitudes towards technology use, there is often a gap between their perceptions and actual implementation. The TPACK framework emerges as a valuable tool for understanding and enhancing teachers' TPACK integration. Common themes include the need for ongoing professional development, access to resources, and support in bridging knowledge gaps. These studies

collectively emphasise that successful technology integration in EFL teaching requires not only favourable attitudes and basic skills but also comprehensive training, institutional support, and a nuanced understanding of how technology intersects with pedagogy and content in language education.



CHAPTER III

METHODOLOGY

This chapter provides the underlying methodology adopted in the current study. The chapter includes six sections. The first part briefly covers the overall research design. The second section deals with the research questions of the study. The third section attempts to explain the research setting and participants of the study. The fourth section elaborates on the data collection procedures. The fifth section offers a proper explanation of the data collection instruments. The chapter concludes with a data analysis procedure.

3.1. Research Design

As Creswell et al. (2011) put it, research designs refer to particular forms of collecting, analysing, and reporting data in research studies. Research studies fall into three integral designs, namely *quantitative*, *qualitative*, or *mixed methods* research designs. Being one of them mixed methods research is an approach that incorporates both quantitative and qualitative research approaches in a single study to offer a more detailed understanding of an area of research. This technique integrates the strengths of quantitative methods, which prioritise numerical analysis and statistical validity, with qualitative methods, which emphasise a thorough exploration of phenomena by means of comprehensive and context-specific knowledge. Integrating both these approaches allows a researcher to address multifaceted research problems more effectively than using each method separately. Mixed methods research is especially useful and valuable in disciplines that involve both numerical data and individual perspectives for thorough analysis and effective implementation (Creswell & Plano Clark, 2018). In this sense, the current study adopted an explanatory sequential mixed methods research design, since the primary goal was to quantify initial patterns and trends and subsequently interpret these findings using qualitative data to gain deeper insights (Creswell & Plano Clark, 2018). This design is beneficial for understanding the context and underlying reasons behind the quantitative results, thus providing a

more comprehensive analysis. It involves a structured process of gathering and analysing data in two distinct stages, each building upon the insights gained from the previous one. Initially, quantitative data is collected and analysed to discern overarching patterns or trends. Subsequently, a qualitative phase is undertaken to delve deeper into these identified trends, providing contextual explanations and comprehensive insights. This sequential approach facilitates a comprehensive exploration of the research topic by allowing quantitative findings to inform the subsequent qualitative investigation (Creswell & Plano Clark, 2018). By doing so, a researcher can address identified gaps or questions in a thorough manner. This methodological approach holds significance as it enables a more comprehensive and refined understanding of the research problem, thereby enhancing the credibility and relevance of the research outcomes (Ivankova, Creswell & Stick, 2006).

With these considerations in mind, the current study adopted a sequential mixed methods research design by utilising a survey technique in order to investigate the technological pedagogical content knowledge levels of in-service instructors and their perception through semi-structured interviews. Both quantitative and qualitative data were gathered, analysed independently during the research, and then integrated. Triangulation was adopted to merge these two phases, facilitating the interpretation of the combined results. The qualitative findings were employed to elucidate and offer a more rigorous contextualisation of the quantitative results and interpretations of the current study.

3.2. Research Questions

In accordance with the above-mentioned research design, the study aimed at exploring the following research questions:

1. What are the TPACK levels of in-service EFL instructors at a state university in Türkiye?
2. Is there a statistically significant difference in TPACK levels among in-service EFL instructors regarding their age groups and teaching experience in terms of:
 - a. technology knowledge?

- b. content knowledge?
 - c. pedagogical content knowledge?
 - d. technological content knowledge?
 - e. technological pedagogical knowledge?
 - f. technological pedagogical content knowledge?
3. What are the perceptions of in-service EFL instructors towards their TPACK levels at a state university in Türkiye?

3.3. Participants and Setting

The first and foremost step in data collection in a research study is to decide upon the people and setting. This means that a researcher must determine the population, a sample group, and the setting for the research. According to Creswell (2012), the term *population* refers to a group of people that have a shared characteristic. Determining the research participants involves selecting individuals by using appropriate sampling procedures for the study. When selecting participants for the current study, convenience sampling method was employed since “respondents were chosen based upon their convenience and availability” (Creswell & Creswell, 2018, p.212). The participants were then asked to get involved in the study and the research was conducted upon their approval (Alvi, 2016). In light of this background information, this research study included 47 participants who were in-service English instructors at BUUSFL during the fall semester of the 2021-2022 academic year.

The research setting of this study, namely BUUSFL, was established as a four-year school and started the compulsory foreign language preparatory class education in the 2001-2002 academic year. In the same year, the Department of Foreign Languages under the Rectorate also joined the school. BUUSFL is responsible for running four different language preparatory programs (English, French, German, Arabic) and also conducts common compulsory foreign language courses (English et al.) in the first grades of all faculties, schools, and vocational schools in accordance with the Article 5/i of the Higher Education Law No. 2547. These undergraduate English programs offer a wide range of general and business English courses to cater for the needs of the

departments across the university. The medium of instruction is English in both compulsory and optional foreign language programs at BUUSFL. The English Preparatory Program is the largest academic unit in BUUSFL, with approximately 54 instructors, both Turkish and international.

3.4. Data Collection Procedures

The current study adopted both quantitative and qualitative data-gathering tools to address the research questions. The following table outlines the data collection tools and data analysis procedures utilised to clarify each relevant research question.

Table 1.

Overview of Research Questions and Corresponding Procedures

Research Questions	Data Collection Instruments	Data Analysis
1. What are the TPACK levels of in-service EFL instructors at a state university in Türkiye?	Quantitative EFL-TPACK Questionnaire (Saraç, 2015) (Adapted version for in-service instructors)	Descriptive Statistics Content Analysis
2. Is there a statistically significant difference in TPACK levels among in-service EFL instructors regarding their age groups and teaching experience in terms of: a. technology knowledge? b. content knowledge? c. pedagogical content knowledge? d. technological content knowledge? e. technological pedagogical knowledge? f. technological pedagogical content knowledge?	Quantitative EFL-TPACK Questionnaire (Saraç, 2015) (Adapted version for in-service instructors)	One-way analysis of variance (ANOVA) Post hoc test
3. What are the perceptions of in-service EFL instructors towards their TPACK levels at a state university in Türkiye?	Semi Structured Interviews	Thematic Content Analysis

Quantitative data was gathered to answer the first research question and second research question supported by related sub-questions, whereas qualitative data was collected to explore the third research question of the current study. For the quantitative data collection, descriptive research design was employed to collect

demographic data and TPACK scores with the purpose of exploring the perceptions of in-service EFL instructors towards technological pedagogical content knowledge levels. Upon setting the framework and purpose, convenience sampling was adopted in order to determine the sample group for the study. As an initial step before the study, required permission to use the questionnaire (see Appendix 3) was requested and obtained from Saraç (2015), who had employed the same EFL-TPACK questionnaire in his thesis for a master's degree. Following that, formal requests for the study were made to both the MAKU Ethical Committee and BUUSFL, where the researcher is an MA student at the former institution and an instructor at the latter. Once the necessary approvals were granted (see Appendix 1 and 4), the questionnaire was implemented for the research. Followingly, the final version of the questionnaire was transferred into Google Forms, a free online platform for creating and analysing questionnaires. All participants were properly briefed about the research study, and their informed consent was requested prior to the questionnaire administration (see Appendix 2). The participants were also notified that their responses would be kept confidential and could withdraw from the questionnaire at any phase. Following these formal procedures, the online questionnaire link was shared via Microsoft Teams, a joint platform where instructors were already registered. In this way, the questionnaire was administered to 47 EFL instructors. The data were gathered approximately in three weeks.

Following the completion of the quantitative data collection process, qualitative data collection was conducted to achieve an in-depth understanding of the current study from the perspectives of BUUSFL in-service instructors. This part of the research employed convenience sampling in which 16 instructors with varying levels of TPACK proficiency volunteered among the initial participating group of 47 in-service instructors. This enabled the incorporation of “potential participants who were convenient in their proximity to the researcher and willing to participate” in the current research study (Robinson, 2014, p. 7).

3.5. Data Collection Instruments

Data collection instruments are key research tools that enable the systematic collection of data regarding the objectives of the study. Integrating quantitative and qualitative methodologies in mixed methods research not only broadens but also deepens the understanding of the research issue. This study employed two fundamental data-gathering instruments: the EFL-TPACK questionnaire and semi-structured interviews. By utilising a combination of these tools, it harnessed the advantages of mixed methods research. The quantitative data derived from the questionnaire offered a comprehensive perspective and helped establish generalisability, whereas the qualitative insights obtained from the interviews provided richness and contextualisation, thus enhancing the overall conclusions and fostering a more comprehensive grasp of the current research.

3.5.1. EFL-TPACK questionnaire. A questionnaire can be defined as a written research instrument comprised of a sequence of items with the objective of obtaining information from respondents. One of the most frequently employed approaches for exploring instructors' knowledge and TPACK levels seems to be self-reporting and assessment questionnaires (Wulansari et al., 2020). With these in mind, the study utilised an online questionnaire since it offers a reasonably affordable, rapid, and effective means of collecting significant volumes of data from a wide sample of individuals. For the quantitative data collection phase, the EFL-TPACK questionnaire developed by Öz (2014) and adapted from the questionnaire used by Saraç (2015) was employed in order to investigate the perceived TPACK levels of in-service EFL instructors.

The questionnaire (see Appendix 5) consisted of two sections. The first part was designed to ascertain the participants' general information such as demographic data, academic qualification, educational background, years of teaching experience, years of LMS experience, years of OTT experience, online class hours and in-service training background regarding TPACK (see Appendix 5, section I). This part of the questionnaire was revisited in compliance with TPACK. In the second part of the questionnaire (see Appendix 5, section II), there were 50 questions based upon a five-

point Likert scale, the items of which were divided into the six components as displayed in the following table.

Table 2.

Distribution of EFL-TPACK Questionnaire items into TPACK components

TPACK Component	Total N of Items	Related Items
Technology Knowledge (TK)	11	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Content Knowledge (CK)	6	12, 13, 14, 15, 16, 17
Pedagogical Content Knowledge (PCK)	12	18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29
Technological Content Knowledge (TCK)	7	30, 31, 32, 33, 34, 35, 36
Technological Pedagogical Knowledge (TPK)	7	37, 38, 39, 40, 41, 42, 43
Technological Pedagogical Content Knowledge (TPCK)	7	44, 45, 46, 47, 48, 49, 50

The questionnaire questions aimed to explore the TPACK levels of participants by asking them to rate how strongly they agreed with each statement, which meant that the participants were expected to respond to each item as *strongly disagree*, *disagree*, *no idea*, *agree*, and *strongly agree* on a scale of 1 to 5. Last but not least, no reverse questions were encountered in any items of related components.

3.5.2. Semi-structured interviews. Creswell (2014) defines semi-structured interviews in educational research as adaptable but targeted means of collecting qualitative data. They blend open-ended questions with a prearranged layout, enabling for depth and investigation while maintaining uniformity throughout interviews.

The semi-structured interview offers “another widespread way of gathering verbal data that are suited for understanding people’s perceptions and experiences” (Blandford, 2013, p. 23). Using this approach allows researchers to gain insight into individuals' experiences, opinions and perspectives while guaranteeing that major areas of relevance are covered. In this sense, in conducting qualitative research investigating the perceptions of EFL instructors at state universities in Türkiye regarding TPACK,

semi-structured interviews were employed to gather comprehensive data. The interview questions (see Appendix 6 and 7) were meticulously crafted and reviewed by five field experts in educational technology and language instruction to ensure their relevance and validity. Instructors were offered both English and Turkish versions of the interview questions to guarantee accessibility and accuracy, thereby minimising the possible linguistic issues and improving the understanding of responses during the interviews. Presenting interview questions to instructors in their preferred language in this way improved the reliability and validity of the relevant qualitative data, and they tended to give more elaborate answers when they had a comprehensive understanding of the questions (Brislin, 1986; Chirkov, 2009). In this regard, they were invited to share insights on their technological competencies, pedagogical approaches, and perceptions of the intersection between technology and language teaching within the TPACK framework. They were also invited to consider any obstacles or difficulties they had while integrating technology into their teaching practices. Throughout the interview process, efforts were made to foster an open and collaborative dialogue, allowing instructors to express their thoughts and experiences without any obstacles. The data collected from these interviews underwent rigorous analysis, including thematic coding and triangulation, to identify recurring patterns, divergent perspectives, and emergent themes. By engaging in this qualitative inquiry, valuable insights were gathered in relation to the unique needs and challenges faced by EFL instructors in Türkiye concerning TPACK integration, thus contributing to the broader discourse on technology-enhanced language instruction, informing the development of targeted interventions and empowering instructors in leveraging technology effectively within their teaching practices.

3.6. Data Analysis Procedure

This study employed a sequential explanatory mixed methods research design by using a survey technique in order to investigate the TPACK levels of in-service instructors and their perceptions through semi-structured interviews. For the purpose of quantitative data analysis, IBM Statistical Package for Social Sciences (SPSS) version 28.0 was employed regarding the data gathered through the EFL-TPACK

questionnaire. First, the quantitative data was analysed by initially checking the reliability of the scores of the variables. The Cronbach's Alpha reliability of the TPACK questionnaire conducted by Saraç (2015) showed a variation between .81 and .89, which meant it was valid enough to be employed. Further analysis of the current TPACK questionnaire, consisting of 50 items, also demonstrated that the questionnaire was found to have high reliability ($\alpha = .97$), as can be seen in the following table.

Table 3.

Reliability Statistics of TPACK Questionnaire

Cronbach's Alpha	N of Items
.970	50

Next, both descriptive and inferential statistics were conducted. For this purpose, descriptive statistics were conducted in an attempt to gather information on frequencies and percentages, averages, and standard deviation values of participants in accordance with their distribution in TPACK components. Subsequent to this procedure, inferential statistics were utilised to interpret the findings from the questionnaire. One-way analysis of variance (ANOVA) was carried out to compare the groups and determine whether there was a statistically significant difference among the means of these groups in terms of TPACK components. Finally, a post hoc test was conducted to locate the exact significant differences between multiple group comparisons.

For qualitative data analysis, respondents were invited to participate in a semi-structured interview following the questionnaire. After analysing the quantitative data, interviews were conducted with 16 instructors who volunteered for the qualitative section of the research, selected from a subject pool of 47 through convenience sampling (Etikan, Musa & Alkassim, 2016). Responses from these interviews were coded, and main themes and sub-themes were identified through thematic analysis (Braun & Clarke, 2006). The thematic analysis serves as a methodological approach

employed in discerning, scrutinising, and elucidating patterns of significance (referred to as 'themes') within qualitative data (Clarke & Braun, 2017). This process revealed four main themes: *overall self-evaluation*, *challenges*, *needs*, and *suggestions*, along with eight sub-themes. The codes and themes were reviewed by two independent experts who developed their own codes and themes. The first expert was an English instructor who had teaching experience of more than 15 years and held a PhD degree in English Language Teaching. The second expert was researcher's supervisor from the English Language Teaching department, who had 17 years above teaching experience. Both experts had academic experience in their fields and gained expertise in qualitative research methodologies. To ensure accurate interpretation and trustworthiness while reducing individual bias, the researcher compared his themes with those of the experts in their presence, resulting in the final version of the themes and codes in accordance with the steps of investigator triangulation (Morse, Barrett, Mayan, Olson & Spiers, 2002). Finally, the codes and themes gathered from interviews were presented to the respondents to confirm whether their statements were categorised correctly, thereby checking interview transcripts for accuracy (Lincoln & Guba, 1985).

3.7. Reliability and Validity of the Study

For any research study, the reliability and validity of data are significant in terms of ensuring the integrity and trustworthiness of the findings, particularly within the scope of a sequential mixed methods research design employed in this study. The current research addressed the validity, reliability, and trustworthiness considerations regarding both quantitative and qualitative data in the following manner.

3.7.1. Reliability and validity of quantitative data. During the quantitative part of the study, assessment of internal consistency using Cronbach's alpha coefficient and convergent validity were employed to ensure the reliability and validity of quantitative data collection.

For internal consistency of the quantitative data, a survey methodology was adopted to assess the technological pedagogical content knowledge levels of in-service EFL

instructors at a state university in Türkiye. Surveys are one of the established methods in educational research that offer “a quantitative description of trends, attitudes, and opinions of a population, or tests for associations among variables of a population, by studying a sample of that population” (Creswell & Creswell, 2018, p. 207). The survey instrument utilised in this study was the EFL-TPACK questionnaire developed by Öz (2014) and adapted from the questionnaire used by Saraç (2015). To ensure the reliability of the survey instrument, internal consistency measurement of Cronbach's Alpha coefficient, which serves as a metric for evaluating the extent to which items within a scale consistently measure the same underlying construct, was employed (Hair et al., 2019). Cronbach's Alpha for the EFL-TPACK questionnaire in this study was .97, which is above the acceptable threshold value concerning the validity of quantitative data collection (Nunnally, 1978). In terms of convergent validity, methodological triangulation was employed to ensure the validity and reliability of the data. The study integrated different methods to strengthen the results of the study and to secure the consistency of findings (Yildirim & Simsek, 2005; Lincoln & Guba, 1985). The quantitative EFL-TPACK questionnaire results were supported and validated by the qualitative data gathered through interviews exploring the viewpoints of in-service EFL instructors towards their TPACK levels.

3.7.2. Trustworthiness of qualitative data. For qualitative research, trustworthiness serves as a similar expression to validity and reliability employed in quantitative research (Lincoln & Guba, 1985). On the qualitative side, procedures such as external auditor, dependability and respondent validation were used to confirm the trustworthiness of the qualitative data collection in this study.

The researcher initially conducted a comprehensive content analysis of the interview data. To ensure the trustworthiness of the qualitative data analysis, an external check is also conducted by “someone who is familiar with the research or the phenomenon explored” (Creswell & Miller, 2000, p. 129). In this sense, an external auditor from the same field was invited for the purpose of peer review, evaluating the same qualitative data, and comparing and contrasting the overall conclusions to further enhance the reliability and validity of qualitative data. Following the expert opinion

process, the interview protocol was developed for dependability purposes. Prior to the implementation of the interviews with the participants, a sample trial session was conducted with two instructors who were not in the participants group. In qualitative terms, to provide evidence for dependability, interview schedules were piloted before real implementation. To strengthen the credibility and reliability of qualitative findings, member checking or respondent validation was implemented in terms of seeking “participants’ views of the credibility of the findings and enhancing confidence in the data interpretations” (Creswell & Poth, 2017, p. 261). The interview findings were shared with four instructors to gather feedback and determine if the data was coherent and understandable.



CHAPTER IV

FINDINGS

This chapter presents both quantitative and qualitative findings and results of the study by outlining the collected data and statistical treatment. The findings of demographic data analysis are presented. The key findings based upon the research questions of the study are subsequently reported.

4.1. Demographic Data

This study employed a questionnaire as a data collection tool that consisted of two sections. The first part was intended to investigate the participants' general information, including demographic data, academic qualification, educational background, years of teaching experience, years of LMS experience, years of OTT experience, online class hours and in-service training background related to TPACK. The distribution of the participants according to their demographic characteristics can be seen below.

Table 4.

Frequency Results of Demographic Information of Participating Instructors

		f	%
Age	26-30	2	4.3
	31-35	7	14.9
	36-40	15	31.9
	41-45	17	36.2
	46-above	3	6.4
	Total	44	93.6
Gender	Male	10	21.3
	Female	34	72.3
	Total	44	93.6
Major	ELT	31	66.0
	Linguistics	5	10.6
	Translation and Interpretation	8	17.0
	Total	44	93.6
Degree	BA	21	44.7
	MA	20	42.6
	PhD	3	6.4

	Total	44	93.6
Teaching Experience	1-5 years	3	6.4
	6-10 years	5	10.6
	11-15 years	10	21.3
	16-20 years	18	38.3
	21-above	8	17.0
	Total	44	93.6
LMS Experience	None	1	2.1
	1-2 years	16	34.0
	More than 2 years	27	57.4
	Total	44	93.6
OTT Experience	1-2 years	30	63.8
	More than 2 years	14	29.8
	Total	44	93.6
Online Class Hours	3-5 hours a week	11	23.4
	6-10 hours a week	21	44.7
	11 or more hours	12	25.5
	Total	44	93.6
Training	Yes	23	48.9
	No	21	44.7
	Total	44	93.6
	System	3	6.4
	Overall Total	47	100.0

As displayed in the table above, the participants of the current study represented dynamic ages, different genders, varying majors, various educational backgrounds, years of teaching experience, years of LMS experience, years of OTT experience, online class hours and in-service training backgrounds regarding TPACK. Regarding their ages, 2 instructors (4.5%) varied between 26-30 years, 7 instructors (15.9%) between 31-35 years, 15 instructors (34.1%) between 36-40 years, 17 instructors (38.6%) between 41-45 years, and 3 instructors (6.8%) were 46-above years old. As far as the valid distribution of the participants according to their gender, 34 instructors were female (77.3%), and 10 were male (22.7%). As for their majors, 31 instructors (70.5%) graduated from the English Language Teaching department, 5 instructors (11.4%) from Linguistics, and 8 instructors (18.2%) majored in Translation and Interpretation. Regarding their educational backgrounds, 21 instructors (47.7%) had a bachelor's degree, 20 instructors (45.5%) held a master's degree, and 3 instructors (6.8%) received a PhD degree.

In terms of teaching experiences in the profession, 3 instructors (6.8%) had teaching experience between 1-5 years, 4 instructors (11.4%) between 6-10 years, 10 instructors (22.7%) between 11-15 years, 18 instructors (40.9%) 16-20 years, and 8 instructors (18.2%) had teaching experience between 21-above years. As for their LMS experience in the teaching profession, only one instructor (2.3%) expressed no previous experience. However, 16 instructors (36.4%) had LMS experience between 1-2 years, and 27 instructors (61.4%) constituted the majority, with more than 2 years of LMS experience. As regards their OTT experience in the teaching profession, 30 instructors (68.2%) had related experience between 1-2 years, whereas 14 instructors (31.8%) held more than 2 years of OTT experience. Concerning online class hours, 11 instructors (25%) had online classes between 3-5 hours a week, 21 instructors (47.7%) between 6-10 hours a week, and 12 instructors (27.3%) taught 11 or more hours online on a weekly basis. Regarding training, 23 instructors (52.3%) stated that they had obtained training about online LMS and/or teaching tools, whereas 21 instructors (47.7%) indicated that they had not received such related training before.

Given these considerations, the following subsections provide a more comprehensive analysis of results in light of the research questions of the current study.

4.1.1. Findings for Research Question 1: What are the TPACK levels of in-service EFL instructors at a state university in Türkiye? Findings in this section are relevant to the first research question of this study that aimed at exploring the perceptions of in-service EFL instructors towards their TPACK levels. The questionnaire consisted of 50 items based upon a five-point Likert scale. In the second section of the questionnaire, participants rated how strongly they agreed with each statement by responding to each item as *strongly disagree*, *disagree*, *no idea*, *agree*, and *strongly agree* on a scale of 1 to 5.

Table 5.

Mean Score and Standard Deviation of Overall TPACK Questions

	N	Lowest Score	Highest Score	<i>M</i>	<i>SD</i>
TPACK	44	3.48	5.00	4.24	.41

The analysis of the overall TPACK questionnaire in Table 5 above offers an insight into the overall TPACK levels of the participants and displays mean and standard deviation of the score from the questionnaire combining all components. The table indicates that the mean score of the EFL-TPACK questionnaire was 4.24. The highest score was 5.00, whereas the lowest one was 3.48.

Table 6.

Analysis of the Scores of TPACK Components

TPACK Component	M	Highest Score	Lowest Score	SD
TK	4.30	5.00	2.73	.54
CK	4.60	5.00	3.50	.42
PCK	4.49	5.00	3.67	.43
TCK	3.97	5.00	3.00	.64
TPK	3.91	5.00	2.43	.59
TPCK	3.99	5.00	2.86	.60

The table above suggests that the highest mean score emerges from the CK component of the TPACK questionnaire, whereas the lowest one seems to result from TPK. Another notable finding in the analysis of scores is that PCK also indicated high levels (M=4.49). In addition, the TK of the participants also seems to be high since the mean score of the TK component is 4.30, which suggests high levels of technology knowledge of the instructors. In the following tables, analysis of scores regarding TPACK components in relation to teaching experience is briefly presented.

Table 7.

Analysis of Scores regarding TK

	Teaching Experience	N	Lowest Score	Highest Score	M	SD
TK	1-5 years	3	4.64	4.91	4.81	.15
	6-10 years	5	3.91	5.00	4.70	.45
	11-15 years	10	3.27	5.00	4.38	.58
	16-20 years	18	3.55	5.00	4.22	.40
	21- above	8	2.73	5.00	3.92	.65
	Total	44	2.73	5.00	4.30	.54

Regarding the Technology Knowledge component, Table 7 above highlights the TK scores of participants in terms of teaching experience. The table suggests that the total mean score of the TK component was 4.30. The highest total score was 5.00, while the lowest total score was 2.73. 10 participants had teaching experience of 1-5 years with a total mean score of 4.81, which indicated a significantly high level of technology knowledge. 5 participants had teaching experience of 6-10 years with a total mean score of 4.70, which meant a relatively high level of technology knowledge. With a total mean score of 4.38, ten participants had teaching experience of 11-15 years, which signified a high level of technology knowledge. 18 participants had teaching experience of 16-20 years with a total mean score of 4.22, which suggested a high level of technology knowledge. Finally, 8 participants had teaching experience of 21-above years with a total mean score of 3.92, which revealed a high level of technology knowledge.

Table 8.

Analysis of Scores regarding CK

	Teaching Experience	N	Lowest Score	Highest Score	M	SD
CK	1-5 years	3	4.83	5.00	4.94	.09
	6-10 years	5	4.67	5.00	4.93	.14
	11-15 years	10	3.50	5.00	4.63	.47
	16-20 years	18	4.00	5.00	4.56	.39
	21- above	8	4.00	5.00	4.31	.44
	Total	44	3.50	5.00	4.60	.42

As for the Content Knowledge component, Table 8 above illustrates the CK scores of participants related to teaching experience. According to the table, it can be inferred that the total mean score of the CK component was 4.60. The highest total score was 5.00, whereas the lowest total score was 3.50. 3 participants had teaching experience of 1-5 years with a total mean score of 4.94, which indicated a significantly high level of content knowledge. 5 participants had teaching experience of 6-10 years with a total mean score of 4.93, which also meant a relatively high level of content knowledge. With a total mean score of 4.63, ten participants had teaching experience of 11-15 years, which signified a high level of content knowledge. 18 participants had teaching experience of 16-20 years with a total mean score of 4.56, which suggested a high

level of content knowledge. The last 8 participants had teaching experience of 21-above years with a total mean score of 4.31, which revealed high level of content knowledge.

Table 9.

Analysis of the Scores regarding PCK

	Teaching Experience	N	Lowest Score	Highest Score	<i>M</i>	<i>SD</i>
PCK	1-5 years	3	4.75	5.00	4.88	.12
	6-10 years	5	3.75	5.00	4.66	.54
	11-15 years	10	3.75	5.00	4.54	.39
	16-20 years	18	3.67	5.00	4.46	.46
	21- above	8	3.92	4.83	4.26	.35
	Total	44	3.67	5.00	4.49	.43

In terms of the Pedagogical Content Knowledge component, Table 9 above presents the PCK scores of participants in relation to teaching experience. As the table displays, it can be concluded that the total mean score of the PCK component was 4.49. The highest total score was 5.00, while the lowest total score was 3.67. 3 participants had teaching experience of 1-5 years with a total mean score of 4.88, which revealed a significantly high level of PCK. 5 participants had teaching experience of 6-10 years with a total mean score of 4.66, which also signified a relatively high level of PCK. With a total mean score of 4.54, ten participants had teaching experience of 11-15 years, which also meant a high level of PCK. 18 participants had teaching experience of 16-20 years with a total mean score of 4.46, which indicated a high level of PCK. The remaining 8 participants had teaching experience of 21-above years with a total mean score of 4.26, which also revealed a high level of PCK.

Table 10.

Analysis of the Scores regarding TCK

	Teaching Experience	N	Lowest Score	Highest Score	<i>M</i>	<i>SD</i>
TCK	1-5 years	3	4.00	5.00	4.42	.51
	6-10 years	5	3.00	5.00	4.22	.83
	11-15 years	10	3.29	5.00	4.05	.66
	16-20 years	18	3.00	4.86	3.82	.60
	21- above	8	3.00	5.00	3.85	.63
	Total	44	3.00	5.00	3.97	.64

As regards the Technology Content Knowledge component, Table 10 above highlights the TCK scores of participants in terms of teaching experience. The table suggests that the total mean score of the TCK component was 3.97. The highest total score was 5.00, while the lowest total score was 3.00. 3 participants had teaching experience of 1-5 years with a total mean score of 4.42, which indicated a significantly high level of technology content knowledge. 5 participants had teaching experience of 6-10 years with a total mean score of 4.22, which meant a relatively high level of technology content knowledge. With a total mean score of 4.05, ten participants had teaching experience of 11-15 years, which signified a high level of technology content knowledge. 18 participants had teaching experience of 16-20 years with a total mean score of 3.82, which suggested a high level of technology content knowledge. Finally, 8 participants had teaching experience of 21-above years with a total mean score of 3.85, which revealed a high level of technology content knowledge.

Table 11.

Analysis of the Scores regarding TPK

	Teaching Experience	N	Lowest Score	Highest Score	<i>M</i>	<i>SD</i>
TPK	1-5 years	3	4.00	4.57	4.33	.29
	6-10 years	5	3.14	5.00	4.28	.79
	11-15 years	10	3.57	5.00	4.07	.48
	16-20 years	18	2.43	5.00	3.65	.64
	“21- above	8	3.43	4.43	3.92	.31
	Total	44	2.43	5.00	3.91	.59

Concerning the Technology Pedagogy Knowledge component, Table 11 above illustrates the TPK scores of participants in accordance with teaching experience. According to the table, it can be inferred that the total mean score of the TPK component was 3.91. The highest total score was 5.00, whereas the lowest total score was 2.43. 3 participants had teaching experience of 1-5 years with a total mean score of 4.33, which indicated a high level of technology and pedagogy knowledge. 5 participants had teaching experience of 6-10 years with a total mean score of 4.28, which also meant a high level of technology and pedagogy knowledge. With a total mean score of 4.07, ten participants had teaching experience of 11-15 years, which signified a high level of technology and pedagogy knowledge. 18 participants had teaching experience of 16-20 years with a total mean score of 3.65, which suggested a high level of technology and pedagogy knowledge. The last 8 participants had teaching experience of 21-above years with a total mean score of 3.92, which revealed a high level of technology and pedagogy knowledge.

Table 12.

Analysis of the Scores regarding TPACK

	Teaching Experience	N	Lowest Score	Highest Score	<i>M</i>	<i>SD</i>
TPACK	1-5 years	3	4.00	4.86	4.42	.42
	6-10 years	5	3.00	5.00	4.31	.84
	11-15 years	10	3.43	5.00	4.12	.53
	16-20 years	18	2.86	4.86	3.79	.58
	21- above	8	3.14	4.71	3.91	.57
	Total	44	2.86	5.00	3.99	.60

Regarding the Technological Pedagogical Content Knowledge component, Table 12 above presents the TPACK scores of participants in relation to teaching experience. As the table displays, it can be concluded that the total mean score of the TPACK component was 3.99. The highest total score was 5.00, while the lowest total score was 2.86. 3 participants had teaching experience of 1-5 years with a total mean score of 4.42, which revealed a high level of technological pedagogical content knowledge. 5 participants had teaching experience of 6-10 years with a total mean score of 4.31,

which also signified a high level of TPACK. With a total mean score of 4.12, ten participants had teaching experience of 11-15 years, which also meant a high level of TPACK. 18 participants had teaching experience of 16-20 years with a total mean score of 3.79, which indicated a high level of TPACK. The remaining 8 participants had teaching experience of 21-above years with a total mean score of 3.91, which also revealed a high level of TPACK.

4.1.2. Findings for Research Question 2: Is there a statistically significant difference in TPACK levels among different teaching experience groups of in-service EFL instructors? Findings in this section are based upon the second research question of this study that investigated the relationship between TPACK components and different teaching experience groups of in-service EFL instructors. A one-way ANOVA test was conducted in order to compare the groups and determine whether there was a statistically significant difference among the means of these groups in terms of TPACK components. Table 13 below presents significant and non-significant statistical results of the means of teaching experience groups in terms of TPACK components.

Table 13.

One-Way ANOVA Test for TPACK components and teaching experience

		Sum of Squares	df	F	Sig.
TKmean	Between Groups	2.957	4	2.947	.032
	Within Groups	9.783	39		
	Total	12.740	43		
CKmean	Between Groups	1.606	4	2.532	.056
	Within Groups	6.184	39		
	Total	7.790	43		
PCKmean	Between Groups	1.088	4	1.494	.223
	Within Groups	7.099	39		
	Total	8.187	43		
TCKmean	Between Groups	1.519	4	.902	.472
	Within Groups	16.423	39		
	Total	17.942	43		
TPKmean	Between Groups	2.640	4	2.056	.105

TPCKmean	Within Groups	12.519	39		
	Total	15.159	43		
	Between Groups	2.039	4	1.436	.240
	Within Groups	13.837	39		
	Total	15.876	43		
	Between Groups	1.641	4	2.782	.040
TPACKgeneralMean	Within Groups	5.754	39		
	Total	7.395	43		

First, the ANOVA result for technology knowledge indicated that there was a statistically significant difference related to technology knowledge [$F(4,39) = 2.947$, $p = .032$]. Next, there was also a significant difference regarding the content knowledge [$F(4,39) = 2.532$, $p = .056$]. However, no statistically significant difference was found for the subscale of pedagogical content knowledge [$F(4,39) = 1.494$, $p = .223$]. Similarly, there was not a statistically significant difference for the component of technology content knowledge [$F(4,39) = .902$, $p = .472$]. Another result also revealed that there was not a significant difference regarding the subscale of technological pedagogical knowledge [$F(4,39) = 2.056$, $p = .105$]. No statistically significant difference was evident for the component of technological pedagogical content knowledge [$F(4,39) = 1.436$, $p = .240$]. The final result, however, suggested that there was a significant difference in reference to total TPACK [$F(4,39) = 2.782$, $p = .040$]. Summarising the ANOVA results regarding differences between TPACK components and teaching experience groups, the statistical results reported significant differences regarding technology knowledge, content knowledge and total TPACK, whereas there were no significant differences in pedagogical content knowledge, technology content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge.

Furthermore, a post hoc Least Significance Difference (LSD) test was carried out to further elaborate the results since a one-way ANOVA test alone would not precisely indicate which means were significantly different from one another.

Table 14.

Multiple Comparison Post Hoc Test Using LSD Method

Dependent Variable	Teaching Experience	Teaching Experience	Mean Difference	Std. Error	Sig.
TKmean	1-5 years	6-10 years	.109	.365	.767
		11-15 years	.436	.329	.193
		16-20 years	.590	.312	.066
		21- above	.897*	.339	.012
	6-10 years	1-5 years	-.109	.365	.767
		11-15 years	.327	.274	.240
		16-20 years	.481	.253	.064
		21- above	.788*	.285	.009
	11-15 years	1-5 years	-.436	.329	.193
		6-10 years	-.327	.274	.240
		16-20 years	.154	.197	.439
		21- above	.461	.237	.059
	16-20 years	1-5 years	-.590	.312	.066
		6-10 years	-.481	.253	.064
		11-15 years	-.154	.197	.439
		21- above	.306	.212	.157
	21- above	1-5 years	-.897*	.339	.012
		6-10 years	-.788*	.285	.009
		11-15 years	-.461	.237	.059
		16-20 years	-.306	.212	.157
CKmean	1-5 years	6-10 years	.011	.290	.970
		11-15 years	.311	.262	.242
		16-20 years	.379	.248	.134
		21- above	.631*	.269	.024
	6-10 years	1-5 years	-.011	.290	.970
		11-15 years	.300	.218	.177
		16-20 years	.368	.201	.075
		21- above	.620*	.227	.009
	11-15 years	1-5 years	-.311	.262	.242
		6-10 years	-.300	.218	.177
		16-20 years	.068	.157	.665
		21- above	.320	.188	.097
	16-20 years	1-5 years	-.379	.248	.134
		6-10 years	-.368	.201	.075
		11-15 years	-.068	.157	.665
		21- above	.252	.169	.144
	21- above	1-5 years	-.631*	.269	.024
		6-10 years	-.620*	.227	.009
		11-15 years	-.320	.188	.097
		16-20 years	-.252	.169	.144
PCKmean	1-5 years	6-10 years	.222	.311	.480
		11-15 years	.347	.280	.224
		16-20 years	.421	.266	.121
		21- above	.628*	.288	.036
	6-10 years	1-5 years	-.222	.311	.480
		11-15 years	.125	.233	.596
		16-20 years	.199	.215	.362
		21- above	.406	.243	.103
	11-15 years	1-5 years	-.347	.280	.224
		6-10 years	-.125	.233	.596
		16-20 years	.074	.168	.662
		21- above	.281	.202	.173
	16-20 years	1-5 years	-.421	.266	.121
		6-10 years	-.199	.215	.362
		11-15 years	-.074	.168	.662
		21- above	.207	.181	.260
	21- above	1-5 years	-.628*	.288	.036
		6-10 years	-.406	.243	.103

TCKmean		11-15 years	-.281	.202	.173
		16-20 years	-.207	.181	.260
	1-5 years	6-10 years	.200	.473	.675
		11-15 years	.371	.427	.390
		16-20 years	.603	.404	.144
		21- above	.571	.439	.201
	6-10 years	1-5 years	-.200	.473	.675
		11-15 years	.171	.355	.632
		16-20 years	.403	.328	.226
		21- above	.371	.369	.322
	11-15 years	1-5 years	-.371	.427	.390
		6-10 years	-.171	.355	.632
		16-20 years	.231	.255	.371
		21- above	.200	.307	.520
	16-20 years	1-5 years	-.603	.404	.144
		6-10 years	-.403	.328	.226
		11-15 years	-.231	.255	.371
		21- above	-.031	.275	.909
	21- above	1-5 years	-.571	.439	.201
		6-10 years	-.371	.369	.322
		11-15 years	-.200	.307	.520
		16-20 years	.031	.275	.909
TPKmean	1-5 years	6-10 years	.047	.413	.909
		11-15 years	.261	.372	.487
		16-20 years	.674	.353	.064
		21- above	.404	.383	.298
	6-10 years	1-5 years	-.047	.413	.909
		11-15 years	.214	.310	.494
		16-20 years	.626*	.286	.035
		21- above	.357	.323	.276
	11-15 years	1-5 years	-.261	.372	.487
		6-10 years	-.214	.310	.494
		16-20 years	.412	.223	.072
		21- above	.142	.268	.598
	16-20 years	1-5 years	-.674	.353	.064
		6-10 years	-.626*	.286	.035
		11-15 years	-.412	.223	.072
		21- above	-.269	.240	.269
	21- above	1-5 years	-.404	.383	.298
		6-10 years	-.357	.323	.276
		11-15 years	-.142	.268	.598
		16-20 years	.269	.240	.269
TPCKmean	1-5 years	6-10 years	.114	.435	.794
		11-15 years	.300	.392	.449
		16-20 years	.634	.371	.095
		21- above	.517	.403	.207
	6-10 years	1-5 years	-.114	.435	.794
		11-15 years	.185	.326	.572
		16-20 years	.520	.301	.092
		21- above	.403	.339	.242
	11-15 years	1-5 years	-.300	.392	.449
		6-10 years	-.185	.326	.572
		16-20 years	.334	.234	.162
		21- above	.217	.282	.445
	16-20 years	1-5 years	-.634	.371	.095
		6-10 years	-.520	.301	.092
		11-15 years	-.334	.234	.162
		21- above	-.117	.253	.646
	21- above	1-5 years	-.517	.403	.207
		6-10 years	-.403	.339	.242
		11-15 years	-.217	.282	.445
		16-20 years	.117	.253	.646
TPACKgeneralMean	1-5 years	6-10 years	.129	.280	.647
		11-15 years	.347	.252	.177
		16-20 years	.544*	.239	.029

	21- above	.633*	.260	.020
6-10 years	1-5 years	-.129	.280	.647
	11-15 years	.218	.210	.306
	16-20 years	.415*	.194	.039
	21- above	.504*	.218	.027
11-15 years	1-5 years	-.347	.252	.177
	6-10 years	-.218	.210	.306
	16-20 years	.197	.151	.201
	21- above	.286	.182	.125
16-20 years	1-5 years	-.544*	.239	.029
	6-10 years	-.415*	.194	.039
	11-15 years	-.197	.151	.201
	21- above	.088	.163	.589
21- above	1-5 years	-.633*	.260	.020
	6-10 years	-.504*	.218	.027
	11-15 years	-.286	.182	.125
	16-20 years	-.088	.163	.589

* The mean difference is significant at the 0.05 level.

As suggested in the table above, post hoc comparisons using the LSD test indicated that there was a significant difference among the Technology Knowledge groups (TK) ($p=.032$, $F = 2.947$). Following the post-hoc analysis, a statistically significant difference was found between 1-5 years of teaching experience and 21 years above of experience ($p = .012$), and the obtained value was greater for participants with 1-5 years of experience ($M = 4.82$). Furthermore, a statistically significant difference was observed between 6-10 years of teaching experience and 21 years above of experience ($p = .009$) and the obtained value was greater for participants with 6-10 years of experience ($M = 4.71$).

There was also a significant difference among Technological Pedagogical Content Knowledge (TPACKgeneral) groups ($p = .040$, $F = 2.782$). After the post hoc analysis, a statistically significant difference was found between 1-5 years of teaching experience and 21 years of experience ($M = .020$), and the obtained value was higher for participants with 1-5 years of experience ($M = 4.67$). In addition, a statistically significant difference was found between 1-5 years of teaching experience and 16-20 years of experience ($p = .029$), and the obtained value was higher for participants with 1-5 years of experience ($M = 4.67$).

Further analysis reported that a statistically significant difference was found between 6-10 years of teaching experience and 21 years of experience ($p = .027$), and the obtained value was higher for participants with 6-10 years of experience ($M = 4.54$). In addition, a statistically significant difference was found between 6-10 years of

teaching experience and 16-20 years of experience ($p = .039$), and the obtained value was higher for participants with 6-10 years of experience ($M = 4.54$).

4.1.3. Findings for Research Question 3. What are the perceptions of in-service EFL instructors towards their TPACK levels at a state university in Türkiye? Findings in this section are pertaining to the third research question of this study. The qualitative findings regarding the perceptions of instructors towards TPACK revealed four main themes leading to eight sub-themes as displayed in the following table.

Table 15.

The Distribution of Main Themes and Sub-Themes

Main Themes	Sub-themes
Overall Self Evaluation	Strengths
	Weaknesses
	Needs
Challenges	Instructor-related
	Student-related
	Institutional-related
Needs	Professional Development
	Accessibility
Suggestions	

The content analysis of the qualitative data revealed four main themes: *overall self-evaluation*, *challenges*, *needs* and *suggestions*. Under the main theme of overall self-evaluation, there emerged three sub-themes as *strengths*, *weaknesses*, and *needs*. As for the main theme of challenges, three sub-themes were discovered, which were listed as *instructor-related*, *student-related*, and *institution-related*. Regarding the main theme of needs, two sub-themes surfaced as *professional development* and *accessibility*. For the final main theme of suggestions, various codes emerged during the content analysis. Given these thematic considerations, a thorough elucidation of the perceptions of sixteen instructors regarding TPACK was offered by means of verbatim excerpts from responses to the interview questions.

4.1.3.1. Main theme 1: overall self-evaluation. Three sub-themes emerged from the content analysis of qualitative data concerning the main theme of overall self-evaluation: strengths, weaknesses, and needs. The following table displays the distribution of these sub-themes and codes in this main theme.

Table 16.

The Distribution of the codes in Main Theme 1

Main Theme	Sub-themes	Codes
Overall Self-Evaluation	Strengths	Availability of different resources
		Ability to adapt to technology
		Ability to include cultural aspects
		Ability to integrate real life situations into classroom
		Ability to use curriculum-based applications
		Ability of fostering learner autonomy
		Proficiency and confidence in utilising technology
	Weaknesses	Difficulty in adaptation to changing roles
		Difficulty in adaptation to technology
		Difficulty in using basic computer skills
		Lack of familiarity with technology
		Limited educational technology knowledge and skills
		Motivational factors
	Needs	Unfamiliarity with the latest IT tools and applications
		In-service training opportunities
		Need for flexibility in technology use
		Need for proper use of IT tools
		On-going support
		Organising and managing digital resources effectively
		Secure and reliable digital platform

4.1.3.1.1. Strengths. In light of the qualitative data, the outstanding findings related to the strengths of instructors and numerous codes that lead to the sub-theme of strengths were identified. In the semi-structured interview, for example, one instructor from the SFL expressed his perceptions regarding the availability of different resources in the following way:

I10: When I can integrate educational technologies into my classes, I can easily access different materials and platforms for teaching purposes.

Another finding related to the sub-theme of strengths was the *ability to adapt to technology*. In this regard, five instructors voiced their ability to adapt to new technologies quickly and utilise them in their lessons effectively in their following statements during their interview:

I15: I can adapt to the requirements of the applications that we are supposed to use in our classrooms quickly.

I16: Right now, I can say that I am satisfied with my technological skills. I adapted and got used to it very quickly.

I11: I believe I made significant progress towards the use of technology during the pandemic period. I believe that I am currently more open to technology use and able to use it more efficiently. It made our lessons more enjoyable.

I14: Generally speaking, I can say that I am making progress in my technology use wherever I encounter an issue or feel the need to learn about it.

I15: I believe that I can adapt to new technologies quite quickly and use them in my own classes.

Additionally, some other instructors highlighted the *ability to include cultural and real-life aspects into their language classes*. With respect to this aspect, one of the participants stated the following in his interview:

I10: Thanks to the tools in the classroom, especially when there is a stable internet connection, I can easily find some real-life situations or cultural content to present to my students.

A further finding that emerged from the sub-theme of strengths was the *ability to use curriculum-based applications*. Regarding their overall self-evaluation, two instructors mentioned their capability to employ technological tools in line with the school curriculum in the following statements:

I18: I can use the technological applications that are part of our curriculum at ease.

I19: I believe that I can use the required programs and platforms effectively.

Similarly, some other instructors articulated some strengths regarding the *ability of fostering learner autonomy*. A few instructors stated that they were able to foster the autonomy of their students when they integrated technology into their classes by incorporating such features as assigning different tasks to different levels of students and giving responsibility for their pacing and learning to the students to some degree. As an example of this perspective, one instructor stated his ideas in the following words in his interview:

I10: Integrating educational technology into my classes enables me to allocate varying tasks and times for different levels of learners. Besides, I can give responsibility for their own learning to some degree, which indirectly fosters their learner autonomy.

Finally, *proficiency and confidence in utilising technology* was the most recurrent code within the sub-theme of strengths. Eight instructors acknowledged their competence and expressed their confidence in using technology in their teaching. In their accounts during the interview, the instructors expressed their perceptions as follows:

I1: I think I am better than many of my colleagues in terms of my knowledge and understanding of technology.

I2: I am comfortable using different digital tools and platforms in my lessons. I can easily navigate through interactive whiteboards and use mobile devices effectively.

I3: Considering the evaluation, I give myself based on the current classroom technology, I think I would score myself four out of five.

I4: I have become quite proficient in using technology in my classes. I have been using various audiovisual tools such as videos, presentations, and online quizzes. It has made my teaching more interactive and engaging for the students.

I10: I feel confident in using technology in my teaching. I can easily adapt to new platforms and take quick action if the need arises.

I13: I feel comfortable in terms of technology as I consider myself someone who is familiar with it, both in the sense of computer usage and internet applications.

I15: I feel quite competent and effective in regard to using technology in my teaching.

I16: I think I am above average regarding technology use. I can say that I am proficient in benefiting from the technological tools that I frequently use in my classes.

4.1.3.1.2. Weaknesses. Drawing on the qualitative data gathered, significant findings associated with instructors' weaknesses and various codes emerged, leading to the sub-theme of weaknesses. To take one example, during the semi-structured interviews, two instructors from the SFL shared their perspectives on the difficulty in adaptation to changing roles in technology integration. On this issue, two instructors stated their perceptions in the following way:

I2: I find it challenging that I cannot annotate on the screen during online classes. The previous system allowed for more flexibility in terms of annotation.

I5: I struggle a bit while I try to adapt to technology because it is constantly changing.

Furthermore, *difficulty in adaptation to technology* was another area of weakness under the main theme of overall self-evaluation. In this sense, one instructor mentioned that she tended to face difficulty in adapting herself to technology with the following statement:

I7: I am not very good at using technology in my lessons. I can use our coursebook quite well. However, I do struggle when it comes to technology. I can sometimes use YouTube to present my students with some related videos or look up word definitions in the online dictionary. That is all about it. I would rate myself five out of ten in terms of technology use.

Another aspect of the sub-theme of weaknesses centred around the *difficulty in using basic computer skills*. Concerning this issue, for instance, two instructors shared their opinions as follows:

I1: I have serious difficulties in using computers, particularly in relation to keyboard shortcuts, software applications and hardware malfunctions.

I6: I cannot say that I am quite capable of using my own laptop or class computer really well. There is always something that I need to develop in terms of my computer skills.

In addition to these various weaknesses, one of the instructors also reported an issue regarding *technology unfamiliarity* in her profession. As for this case, she stated in her reply that:

I14: I could say that I am not generally proficient in technology, and therefore, I am constantly trying to learn and adapt to emerging technologies.

Moreover, three instructors recognised their weaknesses in using technology in terms of *limited education technology knowledge and skills*. During their interview, they expressed their perceptions in the following manner:

I4: I tend to struggle with technology as I have limited knowledge and skills in using educational technologies. I wish I had become more comfortable with it in my lessons.

I9: I do not know anything about the technological programs that are beyond my knowledge.

I12: Although I have learnt how to use digital tools to some extent, I still feel unsure about some simple aspects of technology, such as sharing related documents and opening videos.

Another point highlighted by instructors was *motivational factors* that caused either less use of technology or a lack of interest in relation to technology use. Regarding this point, two instructors voiced their opinions by stating the following in their interview:

I8: I think I am not very interested in using technology. I try not to use it more than necessary.

I11: Am I very curious about technology? If I should give an honest reply to this question, I guess I am not very good at the use of technology.

Last but not least, one instructor reported a weakness regarding *unfamiliarity with the latest Information Technology (IT) tools and applications*. As an example of this perspective, she stated her ideas in the following words in her interview:

I16: It seems that I kind of struggle when I try to use applications that are unfamiliar to me.

4.1.3.1.3. Needs. Considering the qualitative data obtained, key findings attributed to the needs of instructors and further codes leading to the sub-theme of needs under the main theme of overall self-evaluation surfaced during the semi-structured interviews. Various significant codes emerged from the analysis. Of these codes, in-service training opportunities were the most recurrent one in the interview data. As an example of this perspective, five instructors prioritised and mentioned their training needs in terms of professional development in the following statements:

I1: I have serious difficulties in using computers in particular. So, I guess I need to get further training and support in order to develop my technological skills.

I4: I still feel the need for further training and education in the effective use of educational technologies. Technology is constantly evolving, and therefore, I would like to keep myself updated and offer my students the best learning experience.

I11: I would like to receive more training regarding technology use in language education.

I13: As far as our needs are concerned, our school can provide us with practical training on technological pedagogical content knowledge as part of professional development. Additionally, some seminars could be held on relevant topics. Should such seminars be held, I would be happy to participate in them.

I14: I think that would be highly beneficial for us to have training opportunities.

Another reported finding relevant to the sub-theme of needs was the *need for flexibility in technology use*. One instructor from SFL stated his need for improvement in terms of flexibility and options in technology use in the following manner:

I15: If I think something is not really working, or there is a better alternative to the existing platform, why do I still have to use it despite the constraints it holds?

Furthermore, the *need for proper use of IT tools* was another area of need under the central theme of needs. In this context, one instructor mentioned that she felt the need to improve her technological skills and knowledge with the following statement:

I9: I think I need a long way to develop myself a lot in terms of using the technological tools available to us.

In addition, other participating instructors acknowledged the need for *ongoing support* regarding technology use. As an example of this perspective, for instance, one instructor articulated the following statements in her interview:

I5: I have realised that I can understand various technological platforms and learn them better when I receive guidance.

Additionally, some other instructors addressed the need for *organising and managing digital resources effectively*. Concerning this issue, one of the participants stated the following in his interview:

I10: I feel confident in using technology in my teaching. I can easily adapt to new platforms and take quick action if or when needed.

The final need within the scope of overall self-evaluation emphasised by instructors was *secure and reliable digital platform* to support teaching practices in the current system. As for this case, one instructor indicated her needs as follows:

I2: I believe that our institution should prioritise the security of the digital platform. It is crucial to protect the privacy of our students and ensure a safe learning environment.

4.1.3.2. Main theme 2: challenges. Based upon the qualitative research findings, another main theme that emerged was challenges, which were further analysed and categorised into three sub-themes as teacher-related, student-related, and

institution-related. The following table demonstrates the distribution of the sub-themes and codes in this central theme.

Table 17.

The Distribution of the codes in Main Theme 2: Challenges

Main Theme	Sub-themes	Codes
Challenges	Instructor-related	Anxiety and lack of confidence in using technology
		Difficulty in adaptation to new technological platforms
		Difficulty in adapting existing content into technology
		Lack of practical experience in technology use
		Lack of basic knowledge about technological skills
		Maintaining proficiency in technology integration
		Maintaining positive relationship with technology and students
		Personal challenges in using technology
		Resistance to technology
		Technological issues during online exams
		Time management
		Traditional methodologies
		Unfamiliarity with some educational technologies and platforms
	Student-related	Camera problems during online classes
		Diverse technological proficiency
		Financial difficulties
		Internet connection issues
		Inability to integrate content into real life situations
		Lack of basic digital literacy skills
		Lack of language learning experience
		Lack of motivation and engagement in online learning
		Lack of proficiency in effective technology use
		Limited peer interaction during online classes
		Unequal access to technology
	Institution-related	Course materials
		Hardware/software-related issues in classes
		Internet connection issues
		Institutional language teaching approach
		Lack of flexibility in educational technology platforms
		Lack of maintenance for computers
		Limited access to technology
		Limited access to various platforms due to financial constraints
		Lack of a secure and reliable digital infrastructure
		Number of students
		Obligation to follow a tight schedule
		Technological capabilities of devices
		Unfavourable classroom settings

Subsequent sections display the qualitative analysis of the data by elucidating these three sub-themes.

4.1.3.2.1. Instructor-related. The thematic content analysis of qualitative data from participant instructors highlighted a series of instructor-related challenges associated with the integration of TPACK in EFL settings. These challenges encompassed a range of issues, from technical proficiency to personal and pedagogical barriers that inhibited the effective use of technology in language teaching.

According to the findings of the content analysis conducted with the qualitative data, *difficulty in adaptation to new technological platforms* was the most recurrent code that the overwhelming majority of instructors mentioned related to their skill in using technology. The instructors stated that this challenge reflected significant barriers to embracing digital tools in educational settings. Regarding this issue, the participating instructors shared their struggles and adaptation challenges by stating that:

I5: It is a bit difficult for me to explore a new platform when we have just switched to it. Therefore, I must spend some time and work on a new technological platform to be able to understand better.

I10: When you stand in front of the screen, you realise that the teacher identity you have built over the years is shaken, which can sometimes be an emotional and psychological challenge for me.

I15: I find it challenging to adapt to new platforms and technologies. It is not always as easy as it seems because it takes time and effort to learn and integrate them into my teaching.

I16: If I encounter a new technological application for the first time, I may waste time trying to figure it out in the classroom. However, if that is a platform that I am familiar with, I can use it with ease.

Another significant reported instructor-related challenge that was frequently coded among the instructors was *lack of practical experience in technology use*. These instructors had more than 21 years and above teaching experience in their classroom practices and stated that they were more or less involved in technology since pandemic period. Talking about this concern, three instructors discussed the difficulties they faced by remarking that:

I7: I have never received any training or guidance on how to use technology effectively during my lessons.

I10: As far as my own experience is concerned, I may find it challenging when there is a lack of prior information before I begin using a new platform.

I12: I feel I keep on using technology in a limited sense, as I still do not know how to prepare PowerPoint slides and create documents. I also struggle with sharing materials online because it is not always easy to find the right platform or format. I cannot cope with technical issues that disrupt the flow of my online lessons.

Furthermore, some other instructors reported that they faced challenges related to *anxiety and lack of confidence in using technology*. Reflecting on this issue, two instructors expressed their perceptions as follows:

I9: I was a bit anxious at first and had a lack of confidence in using technology in my classrooms.

I12: I tend to panic when something unexpected occurs in a technological sense, especially during classes and exams.

Adapting existing pedagogical content to fit new technological mediums was another significant challenge which can hinder the educational process and the efficacy of digital teaching strategies. In this sense, some instructors reported *difficulty in adapting existing content into technology*. As an example of this perspective, one instructor stated that she confronted adaptation issues with her following statements:

I16: I think we may not always be able to find content that is appropriate for use with educational technology or may have trouble adapting our existing content into technology. This is mostly because very specific topics could emerge, and we may be restricted in such situations, which may be challenging for the instructor.

Additionally, some other instructors mentioned that they reported some issues on *lacking basic knowledge about technological skills*. Reflecting upon this concern, for example, one instructor noted that:

I16: I am good enough at using the internet; however, I have trouble using computers and related hardware. To give a clear example, keyboard shortcuts are a problematic area for me, and I do not know what to do in case of a screen freeze or projector failure in my classes.

Taking a different perspective on instructor-related challenges, one instructor expressed her ongoing struggle to *maintain proficiency in technology integration* in terms of keeping up with the rapidly evolving digital landscape with the following statement:

I2: As an instructor, I feel that I constantly need to update my knowledge and skills in educational technologies. New tools and platforms emerge all the time, and it can be challenging to keep ourselves up to date.

In addition to these numerous codes, personal challenges in using technology were among other reported findings relevant to the integration of technological pedagogical content knowledge. In this context, two instructors from SFL stated their own struggle in the following manner:

I8: I am not that curious about technology. To be frank, I do not allocate much time to using it beyond necessary since I am not the type of person who follows it personally. I also think using technology can sometimes lead to time loss during classes.

I14: The most common difficulty I face is that I do not see myself as very proficient in technology use.

Resistance to technological adoption, which often stems from a preference for traditional methodologies, was another profound challenge among the instructors who had 21 years and above teaching experience. Reflecting upon this issue, one of the instructors indicated that there was a deeper pedagogical conflict between conventional teaching methods and modern technological approaches by reporting in the following manner:

I16: I believe that some instructors display resistance towards recent technology use in their classes, which may lead to disruption in their technology adoption.

Similarly, some other instructors shared some issues regarding *traditional methodologies*. Talking about their preference for conventional practices, for instance, two instructors mentioned the difficulties they faced by remarking that:

I7: I prefer to use traditional teaching methods and thus feel more comfortable with them.

I11: Although I was always inclined towards more traditional methods, I had to start learning recent technologies in my teaching profession.

Referring to frequent disruptions that can significantly impact the delivery and assessment processes in educational settings, two instructors expressed that they were experiencing *technological issues during online exams*. During their interview, they mentioned those difficulties in the following manner:

I4: Conducting online exams has been a challenge for me. I feel that it is difficult to ensure the integrity of exams and prevent cheating cases

I6: I tend to have trouble when a technological issue arises that I have never encountered during my online teaching practices.

Time management was among the significant reported instructor-related challenges, as integrating technology often requires considerable time investment for preparation and execution, which can be overwhelming for instructors already burdened with heavy workloads. As an example of this aspect, two instructors expressed their frustration as follows:

I3: One of the challenges that I face when using technology in my class is that I sometimes have to show them some pictures, videos, and other stuff a lot. So, it may consume much of my teaching time.

I10: Technological glitches during online lessons are all too common. However, my online classroom crashed three times just last week, disrupting the flow of teaching and testing the patience of both students and me.

Taking another perspective on instructor-related challenges, one instructor shared his struggle to *maintain positive relationship with technology and students* by remarking that:

I15: I feel that it is not always easy to foster an effective and favourable bond between our students and the technology we use in our classes.

Finally, *unfamiliarity with some educational technologies and platforms* utilised for teaching practices emerged as one of the sub-themes within the central theme of challenges. Regarding these kinds of challenges, some instructors emphasised that many innovative technologies and platforms were available for them, and they were highly expected to make use of them for teaching purposes in real classroom settings. However, some other participating instructors highlighted that it was challenging for them to keep up with the developments in educational technologies, which resulted in unfamiliarity with some of the tools and platforms. As an example of this perspective, for instance, one instructor articulated the following statements in his interview:

I10: As an instructor, I try to include many different technologies into my teaching. In addition, both students and the institution expect me to update and renovate the tools and platforms on a regular basis; however, keeping up with the pace of developments in educational technologies is not as plausible as expected.

4.1.3.2.2. *Student-related.* The thematic content analysis conducted on the qualitative data collected from participating instructors revealed eleven distinct codes related to the sub-theme of student-related challenges that the instructors face in implementing TPACK in online EFL settings. These findings served as a gateway to understanding the broader technological hurdles that significantly impact the online teaching and learning process. This analysis will further present these codes by grouping them according to their overarching issue areas, providing a structured exploration of the multifaceted challenges that instructors encounter.

As for the student-related challenges, *internet connection issues* were one of the most recurrent codes that the overwhelming majority of instructors stated in terms of technological accessibility. The instructors indicated that these kinds of challenges among students created a fragmented educational experience and, therefore, necessitated immediate technical support. Reflecting upon this issue, six instructors expressed their concerns as follows:

I4: I think internet connectivity is a major challenge, especially for students who live in remote areas. Some of them struggle to access the internet, which affects their participation in online classes.

I6: I think one of the most common challenges is the connection issue that we face in our classes.

I7: Many of my students do not have access to the internet at home. They have to rely on others, such as their friends or family members, to receive help in case of technical issues.

I8: During online classes, internet connection issues may sometimes cause difficulties and have a negative effect on the efficiency of our lessons.

I11: It seems clear that our students are having trouble with internet connection in our online lessons.

I13: I noticed that some of our students have insufficient internet connections in their dormitories. When they try accessing online lessons through the library, they still experience connection issues.

Among the most frequent codes in the interviews was the *lack of motivation and engagement in online learning* that the majority of instructors reported in terms of reflecting the social and psychological challenges faced by students in online environments. They agreed that these challenges were critical for fostering a vibrant

learning community and required innovative approaches to online course design that enhance interaction and engagement through collaborative and interactive activities. Regarding this issue, five instructors noted that:

I1: One of the challenges I face is that our students easily get bored and tired. So, it gets difficult to keep them engaged in the learning process, especially when using technology.

I8: It is during our online classes that our students' lack of motivation may lead to some difficulties and make a negative impact on the effectiveness of our lessons.

I12: One of the challenges that I face is to get students to engage in online materials. Although I try to motivate them to watch related videos and participate in activities, it feels like they are not fully self-directed in their learning.

I13: There may be unmotivated students who are unwilling to participate in our classes. They need to be motivated in due time.

I15: I think some students lack the motivation to engage in our online platforms.

Similarly, some other instructors shared some issues regarding *camera problems during online classes*. They reported that these difficulties impeded visual interaction, which was crucial for language instruction during online teaching practices. Talking about these types of technological accessibility-related student challenges, for instance, three instructors shared their struggles in the following manner:

I4: I face challenges when my students do not turn on their cameras during online lessons since it is important for me to observe their reactions and engagement to adjust my teaching accordingly.

I6: It can be difficult to conduct online lessons when our students do not wish to turn on their cameras.

I11: It gets really frustrating when our students do not switch on their cameras.

Moreover, the participating instructors reported that they faced challenges related to *diverse technological proficiency* among their students. As an example of this issue, one instructor expressed his perceptions as follows:

I4: I noticed that there is a wide range of technological proficiency among our students, which makes it challenging to ensure equal learning opportunities for all.

Referring to *financial difficulties among students* that significantly hinder equal participation in online learning, two instructors expressed that some students were

experiencing economic disparities in their access to technology. During the interview, they stated in their accounts that:

I5: I think our students sometimes face challenges in terms of financial issues.

I7: Some of my students come from low-income families, as they lack a number of basic resources such as the internet, smartphones, and so on.

Inability to integrate content into real life situations was among the other reported student-related challenges, suggesting a disconnection between theoretical knowledge and practical applications that would include contextually rich and applied learning strategies. In this regard, one of the instructors elaborated on these difficulties students face by addressing the following:

I3: In my opinion, one of the student-related challenges is that they just keep on focusing on the content. They just learn and do not integrate that knowledge into their life.

In addition, some other instructors reported the *lack of basic digital literacy skills* among students, highlighting a critical gap in their ability to effectively engage with digital platforms and tools. In addressing challenges related to digital literacy among students, one of the instructors stated in her interview that:

I2: Some of my students struggle with basic digital literacy skills, which makes it challenging to incorporate technology into my lessons.

According to a group of instructors, *lack of language learning experience* was another significant challenge that students faced in educational settings. Regarding this perspective, for instance, one instructor presented her point of view with the following statement:

I16: Our students often do not have much language learning experience before preparatory classes and, therefore, are not aware of the language learning process they will go through.

A further issue emerging from the sub-theme of student-related challenges revolved around the *lack of proficiency in effective technology use*. Some instructors stated that they faced difficulties in teaching students how to utilise technology as effectively as possible. With this in mind, three instructors expressed their disappointment in students' lack of proficiency in technology by elucidating the following:

I1: Our students do not know how to use the internet. They only perceive internet usage as social media. Therefore, we cannot even get them involved in simple applications.

I14: As an instructor, I thought our students were far better and well-equipped compared to us. However, that is not the case at all.

I15: I noticed that some students are unable to edit or convert documents into different formats. They even do not seem to prepare effective PowerPoint presentations.

In addition to these various codes reported, another challenge that surfaced related to students was *limited peer interaction during online classes*, which was significant for fostering a vibrant learning community and required innovative approaches to online course design that enhance interaction and engagement through collaborative and interactive activities. On this issue, for example, one of the instructors from SFL stated that:

I10: It is not difficult to notice that there seems to be limited interaction between our students during the breakout rooms of our online classes.

Last but not least, some instructors reported a prominent challenge about *unequal access to technology*. They argued that this issue required collaborative effort to provide equitable access to educational technologies by means of funding initiatives and resource-sharing agreements for all students. Addressing this final issue, for instance, three instructors noted in their interview that:

I2: Not all our students have access to devices and the internet, which creates inequalities among them in their learning experiences.

I9: Unfortunately, our students do not have the same conditions in terms of technology. For example, there are still students who do not even own a smartphone or cannot buy digital books yet.

I10: The overall conditions of the students, such as economic and living conditions, do not seem to be equal. Compare the examples of a student who can barely connect to online classes through his or her smartphone or another one who uses his or her computer or laptop. These issues affect their ability to participate in online classes.

4.1.3.2.3. Institution-related. The thematic content analysis of the qualitative data from participant instructors also highlighted a series of challenges stemming from institutional contexts, grouped under the sub-theme of institution-related challenges.

These challenges reflected the complexities and limitations that educational institutions faced in integrating technology into their language teaching frameworks effectively. The identified codes ranged from issues with physical resources to constraints imposed by organisational structures and policies.

A core set of challenges was linked to the technological infrastructure within institutions. *Hardware/software-related issues in classes, lack of support from the institution, and technological capabilities of devices* were among the most frequently cited codes as significant barriers. These issues were compounded by *limited access to technology* and *lack of a secure and reliable digital infrastructure*, which hindered the effective deployment of digital learning tools. Furthermore, *internet connection issues* continued to disrupt the learning process, reflecting a critical need for institutions to invest in robust and reliable internet services.

Particularly revealing was how one instructor summarised the institution-related challenges in integrating technology into language teaching with the following statement:

I10: Yes, we do face institution-related challenges. Some challenges arising from institutions include the technological capabilities of our devices, physical conditions of our classrooms, internet connection issues and how effectively the selected institutional language teaching approach aligns with the technology adoption. Even the number of students, for instance, is an institutional factor since our performance in a class of thirty students may not be comparable to that of a class having fifteen students.

Emphasising their ongoing struggle with institutional technology in teaching practices, the overwhelming majority of the participating instructors addressed *hardware/software-related issues in classes* in the following manner:

I4: Some of the projectors that we currently use will not last long enough, as I tend to encounter frequent warnings while I teach in the classroom. They dim a bit, and then a screen message pops up, signalling for a lamp replacement.

I8: The technological infrastructure provided by our institution sometimes causes time loss. As a result, incorporating technology may result in a waste of time and explaining or announcing certain things to our students gets to be a less common practice.

I10: Technological levels of digital tools, physical settings of classrooms, internet connection issues, selected coursebooks and materials are all that matter in terms of institution-related challenges.

I14: Sometimes we face difficulties in terms of hardware, such as outdated equipment that needs to be renewed.

Regarding the issue of *unreliable internet connection*, some other instructors noted that:

I7: The internet connectivity in our classrooms is not that reliable, which makes it difficult to use technology as efficiently as possible.

I9: We tend to face occasional internet connection issues in our classrooms.

Another reported institution-related challenge that emerged during the interviews was the *limited access to technology*. Regarding this aspect, for instance, two instructors highlighted the disparities in technological access by noting that:

I1: Our computers are very weak. I mean, the devices that we currently use are rather outdated and troublesome in terms of technology. In addition, we do not have access to advanced technological tools and resources, which limits our ability to fully utilise technology in the classroom.

I15: Our school lacks the necessary resources to provide access to a wide range of platforms. I feel that we are limited in our options in terms of technology use.

In addition to these numerous codes, *the lack of a secure and reliable digital infrastructure was among other reported findings relevant to a secure technological environment*. Reflecting on the institutional capabilities, one instructor addressed this issue with the following statement:

I2: I think our institution should invest in a secure and reliable digital infrastructure.

Some other instructors reported significant concerns regarding the availability and adaptability of educational resources. Among these were *course materials* that often did not align well with the digital platforms used, indicating a gap between curricular content and technological application. This misalignment was exacerbated by *lack of flexibility in educational technology platforms*, which restricted instructors' ability to tailor learning experiences to student needs and preferences. Additionally, *limited access to various platforms due to financial constraints* highlighted the economic factors affecting institutions' ability to provide diverse and effective learning tools.

Referring to *course material* suitability, one of the participating instructors expressed her concern about a mismatch between the related content and the technological tools. During the interview, he stated in his account that:

I3: As our students just focus on the content, we tend to see a lot of schools change their course materials every year, with those of next year being different as well.

Similarly, *lack of flexibility in educational technology platforms* was a further issue raised in terms of limitations in technology use. Reflecting on the adaptability of educational platforms, for instance, three instructors expressed their concern as follows:

I2: The use of specific platforms required by the institution can be challenging, as they may not always align with our teaching needs.

I6: I would be much happier if we could use Zoom rather than Microsoft Teams because of its user-friendly interface.

I13: I feel more comfortable with using the Zoom platform; however, our school requires us to use Teams. As our school tend to follow a specific curriculum, we do not have flexibility in choosing another platform.

According to a group of instructors, *limited access to various platforms due to financial constraints* was among the other significant challenges that instructors faced in educational settings. Regarding this perspective, for instance, one instructor discussed financial limitations affecting technology use and presented his point of view with the following statement:

I16: As our school lacks the necessary resources to provide access to a wide range of platforms, we become limited in our options due to some financial constraints.

Several other codes that reflected constraints related to institutional policies and the physical classroom environment emerged from the findings of the content analysis conducted with the qualitative data. *Obligation to follow a tight schedule, institutional language teaching approach and unfavourable classroom settings* suggest that institutional norms and physical layouts may not always support the optimal use of technology in language teaching. Moreover, the *number of students* often poses a challenge, as large class sizes may dilute the effectiveness of technology-enhanced learning interventions, making it difficult to manage and personalise instruction.

Taking the issue of *obligation to follow a tight schedule*, one of the instructors from SFL lamented the inflexibility of institutional schedules by stating that:

I8: To put it simply, we share classrooms with other colleagues in our institution. We have a certain curriculum and a set of procedures. Therefore, to ensure the smooth running of these practices, the curriculum should be strictly followed.

I10: I feel better if I can manage or catch up with our course syllabus. However, I cannot help but wonder if doing so actually leads to effective language teaching.

I16: As we tend to follow a tight schedule and try to cover the specific content within the designated time, our technology use can sometimes be disrupted, and therefore, we need to switch to manual instruction to guarantee the related content is covered at the scheduled time.

Additionally, some other instructors reported that they faced institution-related challenges about *unfavourable classroom settings* and *the number of students*. Reflecting on this issue, one instructor commented on physical learning environments by remarking that:

I16: I think gets to be challenging to ensure active participation from all students in classes having more than twenty students.

Last but not least, one of the instructors reported a challenge regarding *lack of maintenance for computers*. Talking about the classroom dynamics, she stated her ideas in the following words in her interview:

I9: I think our computers are not properly provided enough maintenance and upgrades, thus leading to some hardware or software-related issues in classes.

4.1.3.3. Main theme 3: needs. The analysis of qualitative data revealed several codes regarding a further theme, needs. The participating instructors conveyed their needs in terms of effective use of education technologies and TPACK. The following table shows the distribution of the sub-themes and codes in this main theme.

Table 18.

The Distribution of the codes in Main Theme 3

Main Theme	Sub-themes	Codes
Needs	Professional Development	Further training about digital folder management In-service training opportunities Ongoing training and support in technology integration Training about TPACK Training about various technological programs Training and guidance in digital literacy
	Accessibility	Access to a wider range of platforms More flexibility in technology use Bridging the generation gap between students and instructors Following technological trends

There emerged two sub-themes within the central theme of needs as professional development and accessibility. Numerous codes surfaced regarding the professional development sub-theme. Of these codes, *ongoing training and support in technology integration* was one of the most recurring ones in the interview data. Three instructors, in this regard, highlighted their need for ongoing training and support in technology integration in their following statements:

I2: I believe that continuous learning and development are quite essential for instructors so that they can effectively integrate technology into their teaching practices. To this end, we need access to resources and support to enhance our technological skills.

I7: I feel that I need more training and support in using technology in my lessons. I would like to be able to incorporate it seamlessly and effectively to enhance my students' learning experience.

I12: It would be better if I could learn the very basics of technology, such as opening videos, joining online class groups and sharing materials online in our classes.

Another significant reported finding was *further training about digital folder management* in terms of professional development. For instance, one instructor expressed his need in this sense by stating that:

I10: I feel confident in using technology in my teaching. I can confidently say that I can adapt to new platforms and take quick action when needed.

Similarly, one of the instructors mentioned his need for *training about TPACK* in reference to professional development. As for this case, he stated the following in his statement:

I13: I think we have various needs. For instance, our SFL can provide us with lessons about techno pedagogical knowledge as part of professional development. Seminars can be held on relevant topics. If such seminars are to be held, I would be happy to participate in them.

In-service training opportunities were among other needs highlighted by some instructors. Regarding this issue, two instructors expressed their perceptions in their following statements during their interview:

I5: It is clear that in-service training is essential under all circumstances.

I14: I think I probably have some needs in terms of the effective use of educational technologies since I am well aware that I am not quite proficient in these areas yet. We have begun using technology a bit more in the last few years; however, I still need a lot to learn.

In addition to these numerous codes, two instructors voiced their need for *training and guidance in digital literacy* during their teaching practices. During their interview, they expressed their perceptions as follows:

I1: I think all instructors, including me, should receive proper training in digital literacy.

I4: Despite being an instructor expecting to retire soon, I think I still feel the need to attend any seminar or webinar related to technology.

Furthermore, *training about various technological programs* was another area of need under the central theme of needs. In this sense, one instructor mentioned that she felt the need to receive training regarding diverse technological programs with the following statement:

I4: I need to use different technological programs and would like to use them more effectively in teaching English. Since we currently live in an era where the younger generation is quite adept at technology, the more we incorporate them into our lessons, the more enjoyable it can become. Therefore, I believe the more we develop ourselves in this aspect, the better our education system will become.

As for the accessibility sub-theme within the central theme of needs, numerous other codes emerged. For instance, one instructor mentioned his need for *access to a wider range of platforms* and *more flexibility in technology use* to enhance teaching practice. Concerning this issue, he stated the following in his interview:

I15: I need more flexibility in selecting the platforms and technologies that I use in my teaching. It would also be useful to have access to a wider range of platforms to cater to different learning needs.

Another instructor underlined the need to *bridge the generation gap between students and instructors* by stating that:

I10: The broader the generation gap between students and instructors, the more continuous professional development we need in using educational technologies.

Finally, the need to *follow technological trends* was another code that transpired during the interviews. As an example of this issue, one instructor shared her idea in the following statement in her interview:

I5: I think it is essential to be able to keep up with emerging technologies for the purpose of effective use of education technologies.

4.1.3.4. Main theme 4: suggestions. The final emerging theme from the qualitative data analysis of the interviews was based on the suggestions offered by the participating instructors. The following table presents the distribution of the codes in the central theme of suggestions.

Table 19.

The Distribution of the codes in Main Theme 4

Main Theme	Codes
Suggestions	Applications supporting language teaching strategies
	Attending workshops and reading related research articles
	Bringing together instructors with different TPACK-levels
	Developing basic computer literacy skills
	Following online discussion forums
	Functional adaptation of technology into education
	Holding seminars and trainings for instructors
	Improved access to devices and the internet
	Keeping abreast of recent technologies
	Keeping hardware more up-to-date and reliable
	Learning from knowledgeable colleagues
	More training and support in educational technologies
	Offering technology education for students
	Practical trainings in technology use
	Secure and user-friendly digital infrastructure
	Training in technology use in language teaching

Various codes emerged in relation to the main theme of suggestions. Of these codes, *more training and support in using technology* was the most frequent one in the whole interview data. During the semi-structured interviews, for instance, three instructors from the SFL expressed their viewpoints about additional training and assistance in technology use by stating the following statement:

I2: I suggest that our institution invest in training programs and provide resources and support for instructors in using educational technology.

I5: I think we should keep ourselves aware of training sessions about technology. To this end, both our SFL and we, as instructors, should participate in them at every opportunity.

I13: I believe we, as instructors, need more training and guidance in terms of education technologies.

I15: I think instructors need more training and support in using technology effectively.

Another recurrent finding related to the main theme of suggestions was to *hold seminars and trainings for instructors*. In this respect, three instructors offered the following suggestions during their interview:

I8: I believe it would be beneficial for our institution to organise seminars and training sessions regarding technology.

I11: I think institutions, including ours, could support their instructors in terms of adapting them to new technologies through seminars and workshops.

I14: Refreshing training periodically with short, compact, and practical workshops would be beneficial.

Furthermore, some other instructors shared their perspectives upon *offering technology education for students* in their interviews. In this sense, two instructors proposed the following viewpoints in their interview:

I8: I feel that educating students regarding how to use technology may hold significant importance.

I15: From my standpoint, students also need to be motivated and trained in terms of using technology for learning purposes.

A further finding that emerged from the main theme of suggestions was the use of *applications supporting language teaching strategies*. Talking about this perspective, one instructor reported the following in her interview:

I16: I am an instructor who advocates for teaching language strategies in foreign language teaching. Therefore, it seems to me that applications supporting language teaching strategies can be quite beneficial for our students in the language learning process.

Taking another point of view during the interviews, one instructor proposed the idea of *attending workshops, following online discussion forums, and reading related research articles*. In this regard, she articulated her opinion with the following statement:

I9: My suggestion on this issue would be to participate in workshops, follow online discussion forums about educational technology and read related articles in our field.

Particularly revealing was how one instructor highlighted the notion of *bringing together instructors with different TPACK levels*. Concerning this issue, he provided his suggestion in relation to this respect by stating that:

I10: If you bring together a pool of instructors with different levels of technological pedagogical content knowledge, I believe you can achieve horizontal learning by using educational technologies.

In addition to these relevant codes, another instructor offered his suggestion on *developing basic computer literacy skills* for the sake of self-development and teaching practices. During his interview, he expressed his idea in the following manner:

I13: My suggestion for instructors is that they should develop their computer literacy. As you know, nowadays, life is intertwined with technology. Therefore, I believe everyone needs to try to improve themselves in every possible aspect. In terms of better computer and technology usage, they should participate in seminars, conferences, YouTube lessons, and so on. I think these would be good not only for their personal development but also for their teaching practices.

Functional adaptation of technology into education was one of the salient codes that emerged during interviews. As an example of this issue, one instructor stressed the significance of adapting educational technologies into our teaching practices as follows:

I16: I think that would be quite beneficial to investigate how we can adapt technology into our education in circumstances where specific topics could emerge. So, we should be able to know how to deal with this situation in a functional manner.

Some other instructors highlighted the importance of *improved access to devices and the internet*. During the interviews, for instance, one of the instructors provided the following suggestion:

I8: The technological infrastructure offered by our school should be well-designed. We should be able to have better access to the internet and technological devices that are available in our classrooms.

Another reported finding related to the main theme of suggestions was to *keep abreast of recent technologies*. In this sense, one instructor offered the following suggestion during his interview:

I5: I think we should try to keep ourselves informed about all the latest technologies. To this end, both our institution and we, as instructors, should be willing to make any contribution in terms of technology adaptation and sustainability.

Additionally, *keeping hardware more up-to-date and reliable* was one of the related codes that surfaced during semi-structured interviews. Regarding this issue, one instructor expressed his suggestion by emphasising that:

I14: If financial resources may allow, having more up-to-date, recent, and reliable hardware in our classrooms would be a great opportunity.

Similarly, some other instructors stressed the importance of *learning from knowledgeable colleagues*. Two instructors stated that it would prove more practical if they could benefit from other instructors' expertise. As an example of this perspective, they stated their ideas in the following words:

I11: I think more knowledgeable instructors in our school or field can provide us with professional development sessions on the use of educational technologies.

I12: I feel it would be more appropriate to learn from other colleagues. For instance, it could be hands-on practice during workshops or the exchange of ideas about useful digital platforms among instructors in our school.

Taking a broad perspective on the central theme of suggestions, some instructors highlighted that *practical trainings in technology use* were essential for effective integration of technology in education. During the interviews, for instance, two instructors offered the following suggestions:

I1: Instructors need more training and resources to improve their computer and technology skills. Practical workshops and resources would be beneficial in helping us

enhance our technology skills. For instance, I can watch them and manage the technology on my own if I am provided with practical videos that explain to me how to do certain tasks.

I12: I think we need more training and support in using technology effectively.

Another instructor approached the same issue of *training in technology use* from *language teaching* perspective by suggesting in her interview that:

I12: I think it would be helpful to receive professional development workshops or courses that are specifically focused on using technology in language teaching.

The final suggestion offered by instructors was *secure and user-friendly digital infrastructure*. Concerning this issue, one instructor offered the following suggestion:

I2: I suggest that our institution prioritise the development of a secure and user-friendly digital infrastructure for improved technology experience.

Overall, the findings regarding in-service EFL instructors' perceptions of their TPACK levels at a state university in Türkiye revealed significant insights through qualitative analysis. The analysis identified four main themes: *overall self-evaluation*, *challenges*, *needs*, each with several sub-themes and *suggestions* with various codes. Instructors' *overall self-evaluation* theme highlighted strengths such as adaptability to technology, confidence in utilizing technology, incorporation of cultural and real-life elements, use of curriculum-based applications, and fostering learner autonomy. Their self-evaluation also indicated weaknesses including difficulty adapting to changing roles and basic computer skills, limited educational technology knowledge, and motivational factors. Specific needs such as primarily in-service training opportunities, flexibility in technology use, proper use of IT tools, ongoing support, effective management of digital resources, and secure digital platforms emerged from their overall self-evaluation. The *challenges* theme was categorised into instructor-related, student-related, and institution-related issues. Instructor-related challenges included difficulties adapting to new technological platforms, lack of practical experience, anxiety and lack of confidence, and resistance to technological adoption. Student-related challenges encompassed internet connection issues, lack of motivation and engagement, diverse technological proficiency, financial difficulties, and limited peer interaction. Institution-related challenges highlighted hardware and software issues, limited access to technology, misalignment between course materials and digital

platforms, lack of flexibility in educational technology, and constraints due to institutional policies and classroom settings. The *needs* theme emphasised professional development and accessibility. Professional development needs included digital literacy guidance, digital folder management, in-service training opportunities, need for ongoing training and support in technology integration, and specific TPACK training, while accessibility needs incorporated access to a wider range of platforms, flexibility in technology use, bridging the generation gap between students and instructors, and keeping up with technological trends. The final theme emerging from the qualitative data analysis offered numerous *suggestions*. Key suggestions included attending workshops, bringing together instructors with different TPACK levels, developing basic computer literacy skills, establishing a secure and user-friendly digital infrastructure, functional adaptation of technology, holding seminars and workshops, improved access to devices and the internet, learning from knowledgeable colleagues, more training and support in technology use, practical training in technology use from a language teaching perspective, participating in online forums, providing technology education for students, reading research articles, staying current with recent technologies and using applications that support language teaching strategies.

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter discusses the findings of the present study in light of the literature reviewed in Chapter II. The discussion aims to explore the similarities and differences between the current research and previous studies, particularly focusing on the integration of TPACK among in-service EFL instructors at a state university in Türkiye. The results of the present study are discussed by grouping the findings according to the sub-categories of TPACK, the findings in the related literature and the present study.

5.1. Discussion

The discussion section delves into the findings gathered from a mixed methods research design, incorporating both quantitative and qualitative approaches. The primary focus of the study was to explore the levels of TPACK among in-service EFL instructors at a state university in Türkiye, with specific attention to their perceptions and demographic influences. Through the utilisation of questionnaires and semi-structured interviews, the research aimed to unravel the in-depth layers of TPACK proficiency and its implications within the educational field. To this end, quantitative data collection employed a descriptive research design to gather demographic information and TPACK scores from 47 in-service instructors at BUUSFL during the fall semester of the 2021-2022 academic year. This methodological approach facilitated a broad understanding of the participants' characteristics and initial insights into their TPACK levels. The subsequent qualitative phase involved convenience sampling, selecting 16 instructors from the initial participant pool based upon their varying TPACK proficiencies. Semi-structured interviews were conducted to obtain a deeper comprehension of the instructors' perceptions regarding their TPACK levels and the challenges they encounter in effectively integrating technology into pedagogy. Considering these aspects in mind, the discussion of findings is offered by analysing

and synthesising the quantitative and qualitative data to address the relevant research questions in the following subsections.

5.1.1. Discussion of the Findings of RQ 1: What are the TPACK levels of in-service EFL instructors at a state university in Türkiye? Discussions in this section are relevant to the first research questions. Based on the mean score and standard deviation of overall TPACK questions, it seems that participating lecturers of BUUSFL had high TPACK levels. This result seems to be consistent with that of Saraç (2015). The result of this case is not surprising given the fact that all instructors were already familiar with technology use since the beginning of the coronavirus pandemic. Another possible reason could be due to a strong collaboration among colleagues and effective peer learning by means of continuous professional development webinars and seminars available at BUUSFL.

Regarding the TK component, the finding suggested that all teaching experience groups of BUUSFL instructors had a high level of technology knowledge. However, this result is not in agreement with the findings of Alnajjar and Al-Jamal (2019) and those of Prasojo et al. (2020), who suggested that teachers had limited perceived technology knowledge. One possible explanation for this could be due to the less amount of exposure that the participants received in terms of technology use since the study was conducted before the outbreak of the pandemic. Another likely reason might be due to the lack of technology integration in foreign language education in terms of geographical circumstances.

In terms of the CK component, it appears that instructors of all teaching experience groups in BUUSFL had a rather high level of content knowledge, which indicates that the instructors viewed themselves as more competent in content knowledge than the other components. However, this finding does not seem to be consistent with the results of Nazari et al. (2019), who emphasised that experienced teachers did not have a high level of content knowledge. This could be due to the language proficiencies of instructors. Since content knowledge is directly relevant to language competency, it is a significant aspect that serves as a basis for other competencies. Therefore, levels of CK determine instructors' proficiency in their profession.

As for the PCK component, the results of the study revealed that instructors of BUUSFL with different teaching experience groups had significantly higher levels of pedagogical content knowledge. This finding was not consistent with the result of Nazari et al. (2019), who concluded that experienced instructors had a higher level of pedagogical content knowledge. One possible explanation for this case could be that the study was conducted before the outbreak of the coronavirus pandemic. Another possible reason could be context-dependent circumstances. Since PCK provides information related to the competence of instructors to harmonise pedagogy and content, it enables teachers to demonstrate that they can understand what teaching methodologies are appropriate for the content and how parts of that content may be suited for effective teaching.

As regards the TCK component, it seems that various teaching experience groups of lecturers in BUUSFL had high levels of technology content knowledge. This meant that instructors felt themselves capable of combining technological and content skills in their profession. This finding is not in line with that of Alnajjar and Al-Jamal (2019), who linked this result to a lack of interest, not being able to utilise technology in teaching or inadequacy of teacher training programs. This is most probably due to the fact that those teachers had less technology awareness, hands-on experience, and practice since they were not sufficiently exposed to it in their workplace and/or at home.

Concerning the TPK component, the findings revealed that instructors of BUUSFL had a high level of technology and pedagogy knowledge in terms of teaching experience groups. This result seemed to be in agreement with the findings of Nazari et al. (2019). Similarly, as the result suggested, instructors with 1-5 years of experience in BUUSFL had higher levels of technology and pedagogy knowledge compared to those experienced ones. One possible reason why there was such a difference could be due to their younger ages and readiness to utilise both technology and pedagogy.

In terms of the TPCK component, the results of the study suggested that participating lecturers of BUUSFL had high TPCK levels. This finding seems to corroborate the findings of Saraç (2015). The result of this case is not surprising thanks to participants' tendency to bridge and harmonise interconnections among relevant components in

order to build effective and context-dependant teaching for more than two years from the pandemic onwards. Another reason might be due to an effective curriculum and pedagogical emphasis placed on technology integration as well as peer support and collaboration among colleagues in BUUSEFL.

5.1.2. Discussion of the Findings of RQ 2: Is there a statistically significant difference in TPACK levels among in-service EFL instructors regarding their age groups and teaching experience? Discussions in this section are pertinent to the second research question of the current study. Findings of post hoc comparisons using the LSD test indicated that there was a significant difference among the technology knowledge groups as well as among TPACK general groups. To explain further, statistically significant differences were found among 1-5 years of teaching experience and 21 years above of experience; 6-10 years of teaching experience and 21 years above of experience in TK levels of BUUSFL instructors. This result seemed to be consistent with the findings of Saraç (2015), who reported similar significant differences among the same teaching experience groups based on one-way ANOVA using Mann Whitney U Test.

One probable reason for these differences could be related to changes in technological proficiency over time. In other words, instructors having fewer years of experience could be exposed to more technological advancements at the beginning periods of their careers, contributing to probably higher level of TK, whereas those having more years of experience might lack fundamental technological skills due to their lack of technology familiarisation. Another possible explanation for the differences could be that instructors having less experience may have benefited from early CPD sessions focusing upon technology integration ahead of those experienced instructors, which could lead to probably higher TK and TPACK general levels. Instructors with fewer years of experience might also adapt more easily to technological novelties and integrate them into their teaching practice thanks to their smooth technology adoption, leading to higher levels of TK than other colleagues with more experience. Since instructors having fewer years of experience may be more motivated towards pursuing their career and engaging with students, they may wish to become more

technologically proficient and therefore may have higher TK and TPACK general levels, whereas those having more years of experience might hold on to their conventional teaching practices and thus be less motivated for new technologies.

Another finding of post-hoc comparisons using the LSD test also revealed a significant difference among TPACK general groups. In other words, statistically significant differences were found between 1-5 years of teaching experience and 21 years of experience; 1-5 years of teaching experience and 16-20 years of experience; 6-10 years of teaching experience and 21 years of experience; 6-10 years of teaching experience and 16-20 years of experience. However, this result was not in agreement with the findings of Saraç (2015), who reported different significant differences among the same teaching experience groups. The possible explanation for the differences could be that changes over time such as technological developments and pedagogical practices may have changed instructors' TPACK levels, leading to varying results in the study. Institutional variations might also have contributed to these differences. Since different universities and/or MoNE schools may differ in terms of their priority towards CPD, educational policies and the access to technological tools, it is probable that TPACK levels might have yielded different results. Another probable reason that may account for these reported differences could be due to the nature of sample characteristics, since variations in demographic structure, sample size, technological backgrounds and even institutional context of the instructors may have led to diverse results.

5.1.3. Discussion of the Findings of RQ 3: What are the perceptions of in-service EFL instructors towards their TPACK levels at a state university in Türkiye? The qualitative findings provided an in-depth understanding of these quantitative results, enabling a thorough discussion thereof.

They revealed that while instructors feel confident in their content and pedagogical abilities, there are significant challenges and needs in terms of technological integration. Instructors expressed concerns about adapting to rapidly changing technological tools and the lack of continuous professional development specifically tailored to integrating these tools with pedagogical practices and content knowledge.

The findings are organised around four main themes: *overall self-evaluation*, *challenges*, *needs*, and *suggestions*. Each theme comprises several sub-themes and codes derived from the content analysis of interviews with sixteen instructors.

Overall self-evaluation encapsulates instructors' reflections on their strengths, weaknesses, and needs regarding technology integration in teaching. Instructors identified their proficiency in using technology and adaptability to new technological platforms as key strengths. This is supported by Sariçoban et al. (2019), who observed that pre-service EFL teachers generally displayed competence in TPACK, although they also highlighted areas requiring further development, particularly in adapting to new technological trends. This could be explained by the fact that instructors may also have strong competence in terms of utilising available technological tools thanks to practical initial trainings and independent learning. Similarly, weaknesses such as difficulties in adapting to technological changes and limited knowledge of the latest IT tools were noted, which reflects a gap between current competencies and the rapidly evolving technological landscape. These weaknesses might be due to the fact that the rapid pace of technological developments may cause instructors to lag behind in terms of integrating technological advancements into their pedagogical practices.

The study categorised challenges into instructor-related, student-related, and institution-related areas. Fathi and Yousefifard (2019) found that students perceived their EFL teachers as less proficient in integrating technological content knowledge and technological pedagogical knowledge, indicating a gap that might contribute to the challenges faced by instructors in this study. In this sense, these challenges could be attributed to lack of thorough and continuous professional trainings, which may lead to anxiety and lack of confidence in utilising and integrating technology. Institutional challenges such as inadequate hardware/software and unreliable internet access also align with this literature underscoring infrastructure limitations that impact effective technology integration. A probable explanation for these challenges might be that infrastructure problems such as obsolete hardware and unstable network may restrain smooth incorporation of technology into teaching contexts.

The current study's findings underscore a strong demand for continuous professional development to keep abreast of technological advancements and improve teaching

strategies. Consistent with the literature, this seems to corroborate the ideas of Başer, Kopcha, and Ozden (2016), who emphasised the importance of developing comprehensive training in digital literacy and TPACK to equip pre-service teachers with the necessary skills for EFL settings. The need for more flexible and diverse technological platforms, as highlighted by the instructors, could suggest a pathway towards more inclusive and effective educational practices. These needs might be explained by the instructors' wish to keep themselves updated to improve their technological pedagogical knowledge in their practices.

In line with the needs identified, suggestions for improvement focus on enhancing training and support for instructors in technology use. Bostancıoğlu and Handley (2018) discuss using the insights from TPACK assessments to tailor teacher training programs that effectively integrate technology with pedagogical and content knowledge, thus enhancing language teaching practices. A possible explanation for these suggestions could be the use of TPACK-based assessments, through which School of Foreign Languages of universities may design effective and tailored professional development trainings and offer them to their instructors. In addition, instructors' recommendations for updating hardware, improving internet access, and fostering a user-friendly digital infrastructure resonate with these insights, which could propose a holistic approach to overcoming existing barriers and enhancing the technological proficiency of EFL instructors.

The alignment of the study's findings with existing literature highlights a consistent understanding across various contexts regarding the strengths, challenges, and needs related to TPACK in EFL settings. This underscores the critical importance of ongoing professional development and infrastructural support to enhance effective technology integration in language education. These findings could be attributed to the proper understanding of what TPACK means for instructors; how they can benefit from its practices to improve foreign language pedagogy and what kind of platforms they need to develop their technological pedagogical content knowledge.

The strong content knowledge demonstrated by the instructors aligns with Shulman's (1986) emphasis on the importance of deep subject matter understanding for effective teaching. This high level of CK is indicative of the instructors' ability to provide

detailed and accurate content to students, which is crucial in language education, where mastery of complex linguistic structures and rules is essential. The qualitative data complemented these findings, with instructors highlighting their confidence in managing and delivering the curriculum. However, some expressed a need for ongoing updates to their knowledge base to keep pace with developments in linguistic theory and teaching methodologies. In this sense, the results of the current study revealed parallel findings with that of Essam (2021), who not only concluded that the perceptions of teachers regarding content knowledge were a key factor in their number of interactions with the other members within the same community, but also highlighted that they needed assistance to a varying degree educational courses, training sessions and non-traditional approaches to address and overcome the gaps in their content knowledge. The findings of the study related to content knowledge also corroborate the ideas of Köse (2016), who suggested that it was content knowledge that the instructors rated themselves as highly competent in terms of TPACK. Taken together, these results could be explained by the fact that instructors with deep content knowledge may not only prove better than others in terms of teaching complex structures to their students but also keep themselves updated with methodological and technological advancements thanks to continuous professional development.

The qualitative responses reflecting their ability to apply their PCK in teaching contexts indicated that while instructors are adept at using traditional teaching methods, there is a perceived gap in training specifically geared towards integrating new technologies into pedagogical designs. This gap often leads to challenges in applying technological tools in ways that enhance pedagogical outcomes, as instructors may not always be aware of the best practices for using technology to facilitate language learning. These results of the current study are in agreement with the relevant literature pertaining to pedagogical content knowledge, as highlighted by Luik et al. (2019), who concluded that in-service instructors ranked the pedagogy knowledge as the highest, whereas the pre-service teachers considered the lowest among all TPACK domains. The findings related to pedagogical content knowledge also accord with those of Prasojo et al. (2020), who pointed out that EFL in-service instructors lacked the necessary technological knowledge despite their assumption that

they possessed adequate pedagogical knowledge. Overall, these findings could be associated with the nature of traditional methods that some instructors with more years of experience still follow and challenges they face in technology use in their classroom practice.

According to Mishra and Koehler (2006), technological knowledge encompasses more than just familiarity with specific tools; it involves a deep understanding of how technology can transform the teaching and learning processes. In the context of EFL education, technology can significantly enhance the learning experience by providing access to authentic language resources and real-time communication with native speakers (Godwin-Jones, 2012). Therefore, the development of TK is critical not just for operational competency but for its potential to expand pedagogical possibilities. In this context, Önalán and Kurt (2020) propose similar findings and suggest that in-service instructors were predominantly acquainted with common computer applications and showed favourable attitudes regarding the use of technology in classroom settings, which indicates a high degree of self-confidence in adopting and implementing technology into their teaching. However, the findings of the current study do not support the previous research results of some other studies, such as Canbay (2020), who concluded that EFL teachers had a positive attitude towards technology integration in language education; however, they lacked training guidance with regard to technology integration, despite their favourable perceptions about the use of technology. Considering these findings, a possible explanation for this might be that instructors need not only to be familiar with technological tools available to them but also have a more thorough understanding of how to adopt and integrate technology in their pedagogical practices.

The study's findings highlight a gap between the possession of technological tools and the ability to integrate them into teaching strategies that foster student engagement and learning. As Koehler, Mishra, and Cain (2013) articulate, TPK involves making pedagogical choices that leverage technology to build instructive and compelling learning environments. This gap suggests that while instructors may be technologically adept, they are less confident or skilled at merging this knowledge with their teaching methods. The challenge here is not merely technical skill but rather the pedagogical application of technology, which requires ongoing professional development and

support as per the recommendations of Harris, Mishra, and Koehler (2009). This challenge may be explained by two factors. Firstly, this could be related to deep understanding that instructors need regarding how technology may contribute to their pedagogical practices, rather than merely being familiar with technological tools available. Secondly, it might be associated with continuous professional development for effective technology integration.

The analysis of TK, TPK, and TPCK among the participants underscores a vital area for development in the professional training of in-service EFL instructors. Investing in professional development that enhances TK, TPK, and TPCK is essential for instructors to keep pace with the rapid technological advances in education and to effectively address the evolving needs of learners in the digital age. Furthermore, institutions should consider partnerships with technology experts to provide hands-on training in the latest educational technologies, thereby enhancing instructors' confidence and competence in integrating these tools into their teaching repertoire. These considerations could be related to investing in professional development to deepen instructors' understanding of TK, TPK, and TPCK, which is essential for keeping up with technological advancements and adapting to the evolving needs of students. Last but not least, they might also be attributed to partnering with technology experts to provide hands-on training and continuous support, thereby enhancing teachers' confidence and skills in effectively integrating technology into their classrooms.

5.2. Conclusion

The present study aimed to explore the technological pedagogical content knowledge levels of in-service EFL instructors at a state university in Türkiye, using both quantitative and qualitative approaches. The findings provide a detailed understanding of the instructors' strengths and areas for improvement, particularly concerning the integration of technology with pedagogical practices and content knowledge.

The quantitative data indicate that instructors possess high levels of CK and PCK, with mean scores of 4.60 and 4.49, respectively. This reflects their robust understanding of subject matter and effective teaching strategies, consistent with global standards and

emphasising the importance of content knowledge as highlighted by Shulman (1986). However, the study identified a gap in TK and TPACK, with mean scores of 3.91 and 3.99. This suggests that while instructors are proficient in content and pedagogy, further development in integrating technology effectively into their teaching practices is needed. This gap aligns with the findings of Koehler, Mishra, and Cain (2013), who emphasise the challenge of merging technological and pedagogical knowledge.

The qualitative data provided deeper insights into these quantitative results. Instructors expressed confidence in their content and pedagogical abilities but highlighted significant challenges in technological integration. Concerns about adapting to rapidly changing technological tools and the lack of continuous professional development tailored to integrating these tools were prominent themes. These qualitative findings underscore the critical need for continuous professional development, a point emphasised by Baser, Kopcha, and Ozden (2016), who advocate for comprehensive training in digital literacy and TPACK for pre-service teachers.

Additionally, the study revealed institutional challenges related to inadequate hardware, software, and unreliable internet access, which impede effective technology integration. These challenges reflect a broader need for institutional support in providing a robust digital infrastructure, as suggested by Harris, Mishra, and Koehler (2009).

The findings suggest that while the participating instructors are on par with global standards in terms of CK and PCK, they face challenges similar to those reported in international contexts regarding technological integration. This underscores a universal need for teacher education programs to continually evolve and include comprehensive training in technological integration. To bridge the identified gaps, targeted interventions are necessary. Professional development programs should focus on enhancing TK, TPK, and TPCK, equipping instructors with the skills to integrate technology effectively into their teaching practices. Furthermore, institutions should consider partnerships with technology experts to provide hands-on training in the latest educational technologies.

In conclusion, this study highlights significant strengths in content and pedagogical knowledge among EFL instructors while underscoring a critical need for enhanced

technological training. The integration of qualitative insights with quantitative data provides a comprehensive overview of the instructors' capabilities and challenges, offering a foundation for targeted interventions aimed at enhancing TPACK competencies in the realm of EFL teaching. The findings emphasise the dynamic interplay between technology, pedagogy, and content knowledge, pointing towards future directions for both practice and research in improving educational outcomes.

5.3. Implications of the Study

The findings of this study provide noteworthy perspectives on the TPACK levels of in-service EFL instructors at BUUSFL and carry significant implications for various stakeholders. By addressing the needs and potential actions for policymakers, educational institutions, EFL instructors, and future researchers, this section outlines the essential steps required to enhance the integration of technology in EFL education. The goal is to foster an environment where instructors are well-equipped with the necessary technological, pedagogical, and content knowledge to improve their teaching practices and student outcomes.

For Policymakers

The results suggest the necessity for integrating comprehensive professional development programs focused on TPACK for EFL instructors. It is recommended that policymakers allocate resources and formulate policies supporting continuous and systematic professional development, including funding for workshops, seminars, and online courses that emphasise the application of technology in EFL instruction. Policies that promote collaboration among educational institutions to share best practices and resources can help ensure a consistent and high-quality approach to TPACK development across various educational contexts. Establishing clear guidelines and standards for technology use in education is also crucial to support teachers in adopting innovative teaching methods.

For Educational Institutions

Educational institutions are encouraged to prioritise enhancing EFL instructors' TPACK by providing ongoing support and resources. This includes the establishment

of dedicated training centers or departments responsible for organising regular professional development activities tailored to the needs of EFL instructors. Investing in necessary technological infrastructure, including up-to-date hardware, software, and reliable internet access, is essential to support innovative teaching practices. Encouraging a culture of continuous learning and experimentation with new technologies can help instructors stay updated with the latest advancements. Additionally, facilitating peer collaboration and mentoring programs can enable instructors to learn from each other's experiences and expertise. Mechanisms to continuously assess and address the technological needs and challenges faced by instructors are important for effective technology integration into pedagogy.

For EFL Instructors

EFL instructors are advised to take an active role in their professional development by seeking opportunities to enhance their TPACK. This involves participating in workshops, enrolling in relevant courses, and engaging with professional learning communities. Instructors should stay informed about the latest technological advancements and pedagogical strategies by reading academic journals, attending conferences, and networking with peers. Reflective practice is crucial; instructors should regularly assess their own TPACK levels and seek feedback to identify areas for improvement. By adopting a proactive approach to professional growth, EFL instructors can enhance their teaching effectiveness and better meet the diverse needs of their students.

For Future Researchers

This study opens several avenues for future research in TPACK and EFL instruction. Future researchers might explore the long-term impacts of enhanced TPACK competencies on student achievement and engagement in EFL settings. Longitudinal studies examining how TPACK evolves over time with ongoing professional development could provide valuable insights. Researchers may also investigate the impact of specific training programs on TPACK development and subsequent effects on student outcomes. Understanding the role of institutional support and the effectiveness of various professional development models can inform the design of more effective interventions. Cross-cultural studies could provide a broader

understanding of TPACK in diverse educational contexts, facilitating the development of globally relevant strategies for TPACK enhancement.

5.4. Recommendations for Future Research

This study offers a valuable perspective on the nature of in-service instructors' technological pedagogical content knowledge levels and their perceptions in university EFL classrooms. Based upon the findings and implications, there are several suggestions for future research. Further studies on EFL instructors' perceptions of TPACK levels may consider using diverse and robust sampling techniques to improve the reliability and depth of findings. One approach could be to use stratified random sampling, categorising instructors based upon their teaching experience and then randomly selecting an equal number from each instructor group. This method could provide a comprehensive representation of instructors across various experience levels. Moreover, purposive sampling could be used to select instructors who are recognised for their ideal integration of technology into teaching practices, as their insights would be particularly valuable for understanding advanced TPACK practices. Future research may aim for a larger sample size in the quantitative phase to draw more robust conclusions. For instance, snowball sampling could also be beneficial; starting with a few appropriate instructors and having them refer others who meet the study criteria can help identify a wider pool of qualified participants. Furthermore, addressing issues regarding missing data through diligent data collection methods or ensuring complete questionnaire responses could further enhance the robustness of the findings. Last but not least, using multiple interviewers or ensuring thorough training and standardisation in interviewing techniques could mitigate potential biases, thereby contributing to the reliability of the results.

REFERENCES

- Alnajjar, H. S., & Al-Jamal, D. A. (2019). UNRWA EFL In-Service Teachers' Perception of the Application of TPACK in Teaching Listening and Speaking. *IUG Journal of Educational and Psychological Sciences*, 27(2), 56-72.
- Alnujaidi. (2021). A Contrastive Analysis of Pre-Service and In-Service EFL Teachers' Levels of Technological, Pedagogical, and Content Knowledge. *Studies in Literature and Language*, 22(1), 21-33.
- Alvi, M. A. (2016) *Manual for Selecting Sampling Techniques in Research*; MPRA Paper No. 70218; University of Karachi, Iqra University: Karachi, Sindh, Pakistan.
- Aniq, L. N., & Drajati, N. A. (2019). Investigating EFL teachers' perceptions on their TPACK development: how EFL teachers view seven domains on TPACK framework. *Leksika: Jurnal Bahasa, Sastra dan Pengajarannya*, 13(2), 95-101.
- Avcı, T. (2014). *Fen bilimleri öğretmenlerinin teknolojik pedagojik alan bilgisi ve öz güven düzeylerinin belirlenmesi* (Master's thesis). Celal Bayar Üniversitesi Fen Bilimleri Enstitüsü, Manisa. Retrieved from <https://tez.yok.gov.tr/UlusalTezMerkezi/> (Thesis no: 373793)
- Baser, D., Kopcha, T. J., & Ozden, M. Y. (2016). Developing a technological pedagogical content knowledge (TPACK) assessment for preservice teachers learning to teach English as a foreign language. *Computer Assisted Language Learning*, 29(4), 749-764. <https://doi.org/10.1080/09588221.2015.1047456>
- Baş, G., & Şentürk, C. (2018). An Evaluation of Technological Pedagogical Content Knowledge (TPACK) of In-Service Teachers: A Study in Turkish Public Schools. *International Journal of Educational Technology*, 5(2), 46-58. Retrieved from <https://eric.ed.gov/?id=EJ1201784>

- Blandford, A. (2013). Semi-structured qualitative studies. In M. Soegaard & R. F. Dam (Eds.), *The encyclopedia of human-computer interaction* (2nd ed.). (pp. 1-53). Aarhus, Denmark: The Interaction Design Foundation. Retrieved from https://discovery.ucl.ac.uk/id/eprint/1436174/2/semi-structured_qualitative_studies.pdf
- Bostancıoğlu, A., & Handley, Z. (2018). Developing and validating a questionnaire for evaluating the EFL ‘Total PACKage’: Technological Pedagogical Content Knowledge (TPACK) for English as a Foreign Language (EFL). *Computer Assisted Language Learning*, 31(5–6), 572–598. <https://doi.org/10.1080/09588221.2017.1422524>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner & J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137-164). Thousand Oaks, CA: Sage.
- Bursa Uludag University School of Foreign Languages. (2021). *BUUSFL Preparatory Program Design*. Retrieved from https://uludag.edu.tr/dosyalar/ydyo/ÜST%20MENÜ/Kalite%20Belgeleri/quality_handbook_epp_design_model.pdf
- Cahyono, B. Y., Kurnianti, O. D., & Mutiaraningrum, I. (2016). Indonesian EFL teachers’ application of TPACK in in-service education teaching practices. *International Journal of English Language Teaching*, 4(5), 16-30.
- Canbay, F. (2020). EFL Teachers’ Views about Technology Integration in English Language Teaching: A Case Study. *i-Manager's Journal on English Language Teaching*, 10(2), 54.
- Chirkov, V. (2009). Critical psychology of acculturation: What do we study and how do we study it, when we investigate acculturation? *International Journal of*

Intercultural Relations, 33(2), 94–105. <https://doi.org/10.1016/j.ijintrel.2008.12.004>

Clarke, V., & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology*, 12(3), 297–298. <https://doi.org/10.1080/17439760.2016.1262613>

Cox, S., & Graham, C. R. (2009). Diagramming TPACK in Practice: Using an elaborated model of the TPACK framework to analyze and depict teacher knowledge. *TechTrends*, 53(5), 60-69. <https://doi.org/10.1007/s11528-009-0327-1>

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Thousand Oaks, CA: Sage.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Thousand Oaks, CA: Sage.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice*, 39(3), 124–130. https://doi.org/10.1207/s15430421tip3903_2

Creswell, J. W., Klassen, A. C., Plano Clark, V. L., & Smith, K. C. (2011). *Best practices for mixed methods research in the health sciences*. Bethesda, MD: National Institutes of Health. Retrieved from https://www.csun.edu/sites/default/files/best_prac_mixed_methods.pdf

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). Thousand Oaks, CA: Sage.

Çakmak, M., & Gündüz, M. (2018). Pre-service ELT Teachers' Perceptions of Characteristics of Effective Teachers. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi*, 38(1), 359-383.

- Çebi, A. (2018). Teachers' Perceptions toward Technology Integration into the Language Teaching Practices. *Journal of Narrative and Language Studies*, 6(11), 150–177. Retrieved from <http://nalans.com/index.php/nalans/article/view/126>
- Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford: Oxford University Press.
- EFL. (n.d.). In *Collins COBUILD Advanced Learner's Dictionary*. Retrieved from <https://www.collinsdictionary.com/dictionary/english/efl>
- ELT. (n.d.). In *Oxford Advanced Learner's Dictionary*. Retrieved from <https://www.oxfordlearnersdictionaries.com/definition/english/elt?q=ELT>
- Ergen, B., Yanpar Yelken, T., & Kanadli, S. (2019). A Meta-Analysis of Research on Technological Pedagogical Content Knowledge by Gender. *Contemporary Educational Technology*, 10(4), 358-380. <https://doi.org/10.30935/cet.634182>
- Essam, R. (2021). Exploring the needs of teachers in a Middle East university using TPACK: A case study. *Studies in Technology Enhanced Learning*, 1(2), 331-343. <https://doi.org/10.21428/8c225f6e.b9366ecd>
- Etikan, I., Musa, S.A., & Alkassim, R. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4.
- Fathi, J., & Yousefifard, S. (2019). Assessing language teachers' technological pedagogical content knowledge (TPACK): EFL students' perspectives. *Research in English Language Pedagogy*, 7(2), 255-282.
- Godwin-Jones, R. (2012). *Challenging hegemonies in online learning*. *Language Learning & Technology*, 16(2), 4–13. <http://dx.doi.org/10125/44279>
- Hana, J. N. (2020). *The Perceptions of Pre-Service English Teachers to Technological Pedagogical Content Knowledge in EFL Classroom* (Bachelor's thesis). UIN

Sunan Ampel Surabaya, Indonesia. Retrieved from <https://core.ac.uk/works/104466889/>

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types: Curriculum-based Technology Integration Reframed. *Journal of Research on Technology in Education*, 41(4), 393–416. <https://doi.org/10.1080/15391523.2009.10782536>

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hsu, P. L. (2016). Science Teaching Experiences in Informal Settings: One Way to Enrich the Preparation Program for Preservice Science Teachers. *Universal Journal of Educational Research*, 4(5), 1214-1222.

İşler, C., & Yıldırım, Ö. (2018). Perceptions of Turkish pre-service EFL teachers on their technological pedagogical content knowledge. *Journal of Education and Future*, 13, 145-160. Retrieved from <https://www.proquest.com/scholarly-journals/perceptions-turkish-pre-service-efl-teachers-on/docview/2122479423/se-2>

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field Methods*, 18(1), 3-20. <https://doi.org/10.1177/1525822X05282260>

Kaleli Yılmaz, G. (2015). Analysis of Technological Pedagogical Content Knowledge Studies in Turkey: A Meta-Synthesis Study. *Education and Science*, 40(178), 103-122. <http://dx.doi.org/10.15390/EB.2015.4087>

Kassem, M. A. (2018). Balancing Technology with Pedagogy in English Language Classroom: Teachers' perspective. *International Journal of English Language Teaching*, 6(9), 1-19. Retrieved from <https://ejournals.org/ijelt/vol-6-issue-9-december-2018/balancing-technology-with-pedagogy-in-english-language-classroom-teachers-perspective/>

- Kesen Mutlu, A. & Özkan, Y. (2017). Pre-service English Language Teachers' Views of the Effective Teacher and Teaching. *Mediterranean Journal of Humanities*, 7(1), 213-231. <https://dx.doi.org/10.13114/MJH.2017.332>
- Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research*, 32(2), 131-152. <https://doi.org/10.2190/0EW7-01WB-BKHL-QDYV>
- Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70. Retrieved from <https://citejournal.org/volume-9/issue-1-09/general/what-is-technological-pedagogicalcontent-knowledge/>
- Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2014). The technological pedagogical content knowledge framework. In *Handbook of Research on Educational Communications and Technology* (pp. 101-111). Springer, New York, NY.
- Koehler, M. J., Mishra, P., & Cain, W. (2013). What is Technological Pedagogical Content Knowledge (TPACK)? *Journal of Education*, 193(3), 13-19. <https://doi.org/10.1177/002205741319300303>
- Koehler, M. J., Shin, T. S., & Mishra, P. (2012). How do we measure TPACK? Let me count the ways. In *Educational technology, teacher knowledge, and classroom impact: A research handbook on frameworks and approaches* (pp. 16-31). IGI Global.
- Kozikoğlu, İ., & Babacan, N. (2019). The investigation of the relationship between Turkish EFL teachers' technological pedagogical content knowledge skills and attitudes towards technology. *Journal of Language and Linguistic Studies*, 15(1), 20-33. Retrieved from <https://www.jlls.org/index.php/jlls/article/view/998>

- Köse, N. K. (2016). Technological pedagogical content knowledge (TPACK) of English language instructors. *Journal of Educational & Instructional Studies in the World*, 6(2), 12-19. Retrieved from https://eprints.tiu.edu.iq/760/1/wjeis_2016.2.pdf
- Kurt, G., Akyel, A., Koçoğlu, Z., & Mishra, P. (2014). TPACK in practice: A qualitative study on technology integrated lesson planning and implementation of Turkish pre-service teachers of English. *ELT Research Journal*, 3(3), 153-166. Retrieved from <https://dergipark.org.tr/tr/download/article-file/63644>
- Külekçi, G. (2018). Identifying the Perceptions of Prospective English Language Teachers on Characteristics of Effective Teachers: Who Is the Ideal Teacher? *Novitas-ROYAL (research on Youth and Language)*, 12(1), 1-15. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1177690.pdf>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.
- Long, T., Zhao, G., Li, X., Zhao, R., Xie, K., & Duan, Y. (2020). Exploring Chinese in-service primary teachers' technological pedagogical content knowledge (TPACK) for the use of thinking tools. *Asia Pacific Journal of Education*, 42(2), 350–370. <https://doi.org/10.1080/02188791.2020.1812514>
- Loewenberg Ball, D., Thames, M. H., & Phelps, G. (2008). Content Knowledge for Teaching: What Makes It Special? *Journal of Teacher Education*, 59(5), 389-407. <https://doi.org/10.1177/0022487108324554>
- Luik P., Taimalu M., & Laane H. (2019) Estonian In-Service Teachers' and Pre-service Teachers' Perceptions of Content, Pedagogy, and Technology Knowledge, Based on the TPACK Framework. In Väljataga T., Laanpere M. (eds) *Digital Turn in Schools—Research, Policy, Practice. Lecture Notes in Educational Technology*. Singapore: Springer. https://doi.org/10.1007/978-981-13-7361-9_8

- Martin, J. (2019). *Pre-service TVET teachers' perceptions of their readiness to integrate ICT in the curriculum*. Munich: GRIN Verlag. Retrieved from <https://www.grin.com/document/501866>
- Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017-1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Mishra, P., & Koehler, M. J. (2008, March). Introducing technological pedagogical content knowledge. *Journal of Research on Technology in Education*, 42(2), 123–149. Retrieved from <https://files.eric.ed.gov/fulltext/EJ868626.pdf>
- Mishra, P. (2019). Considering contextual knowledge: The TPACK diagram gets an upgrade. *Journal of Digital Learning in Teacher Education*, 35(2), 76-78. <https://doi.org/10.1080/21532974.2019.1588611>
- Mittal, R. (2015). The Impact of Technology on Language Teaching. *International Journal of Research*, 2(7), 523-527. Retrieved from <https://journals.pen2print.org/index.php/ijr/article/view/2431/2332>
- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification Strategies for Establishing Reliability and Validity in Qualitative Research. *International Journal of Qualitative Methods*, 1(2), 13-22. <https://doi.org/10.1177/160940690200100202>
- Mouza, C., Nandakumar, R., Yilmaz Ozden, S., & Karchmer-Klein, R. (2017). A Longitudinal Examination of Preservice Teachers' Technological Pedagogical Content Knowledge in the Context of Undergraduate Teacher Education. *Action in Teacher Education*, 39(2), 153-171. <https://doi.org/10.1080/01626620.2016.1248301>
- Muhaimin, M., Habibi, A., Mukminin, A., Saudagar, F., Pratama, R., Wahyuni, S. et al. (2019). A sequential explanatory investigation of TPACK: Indonesian science teachers' survey and perspective. *Journal of Technology and Science Education*, 9(3), 269-281. <https://doi.org/10.3926/jotse.662>

- Mukminin, A., Habibi, A., & Fridiyanto. (2020). Technology in the classroom. *Informatologia*, 53(1-2), 24-36. <https://doi.org/10.32914/i.53.1-2.3>
- Mutluoğlu, A, & Erdoğan, A. (2016). İlköğretim Matematik Öğretmenlerinin Öğretim Stili Tercihlerine Göre Teknolojik Pedagojik Alan Bilgi (TPAB) Düzeylerinin İncelenmesi. *OPUS – Uluslararası Toplum Araştırmaları Dergisi*, 6(10), 102-126. Retrieved from <https://dergipark.org.tr/tr/download/article-file/210735>
- Nazari, N., Nafissi, Z., Estaji, M., & Marandi, S. S., & Wang, S. (2019). Evaluating novice and experienced EFL teachers' perceived TPACK for their professional development. *Cogent Education*, 6(1), 1-26. <https://doi:10.1080/2331186x.2019.1632010>
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Ozer, M. A., Latorre, J., Rutledge, D., Mansour, T., & Altamirano, A. (2019). Digital native pre-service teachers' perceptions of using commercial and open-source online applications in future praxis after completing technology integration course. *International Journal of Learning, Teaching and Educational Research*, 18(2), 103-116. <https://doi.org/10.26803/ijlter.18.2.8>
- Önalın, O., & Kurt, G. (2020). Exploring Turkish EFL teachers' perceptions of the factors affecting technology integration: A case study. *Journal of Language and Linguistic Studies*, 16(2), 626-646. Retrieved from <https://www.jlls.org/index.php/jlls/article/view/1775>
- Öz, H. (2014). Pre-service English teachers' perceptions of web-based assessment in a pedagogical content knowledge course. *Procedia-Social and Behavioural Sciences*, 141, 45-58. <https://doi.org/10.1016/j.sbspro.2014.05.010>
- Pilgrim, J., & Martinez, E. (2015). Literacy Terminology and Technology Integration for 21 st Century Teaching: A Survey of Educators. *Journal of Reading Education*, 40(3), 9-16. Retrieved from <https://eds.p.ebscohost.com/eds/pdfviewer/pdfviewer?vid=0&sid=c8c39bf7-1c8e-4827-9646-09522a819a0e%40redis>

- Polly, D., Mims, C., Shepherd, C. E., & Inan, F. (2010). Evidence of impact: Transforming teacher education with preparing tomorrow's teachers to teach with technology (PT3) grants. *Teaching and Teacher Education*, 26(4), 863–870. <https://doi.org/10.1016/j.tate.2009.10.024>
- Prasojo, L. D., Habibi, A., Mukminin, A., & Yaakob, M. F. M. (2020). Domains of Technological Pedagogical and Content Knowledge: Factor Analysis of Indonesian In-Service EFL Teachers. *International Journal of Instruction*, 13(4), 593-608. <https://doi.org/10.29333/iji.2020.13437a>
- Raygan, A., & Moradkhani, S. (2020). Factors influencing technology integration in an EFL context: Investigating EFL teachers' attitudes, TPACK level, and educational climate. *Computer Assisted Language Learning*, 35(8), 1789–1810. <https://doi.org/10.1080/09588221.2020.1839106>
- Richards, J. C. (2015). Technology in Language Teaching Today. *Indonesian Journal of English Language Teaching*, 10(1), 18-32. Retrieved from <https://ejournal.atmajaya.ac.id/index.php/ijelt/article/view/1506/758>
- Robinson, O. C. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology*, 11(1), 25-41. <https://doi.org/10.1080/14780887.2013.801543>
- Şahin, İ. (2011). Development of survey of technological pedagogical and content knowledge (TPACK). *Turkish Online Journal of Educational Technology-TOJET*, 10(1), 97-105. Retrieved from <https://files.eric.ed.gov/fulltext/EJ926558.pdf>
- Saraç, M. (2015). *An explanatory investigation on the Turkish EFL teachers' TPACK and their attitudes toward the use of interactive whiteboards* (Master's thesis). Anadolu University, Eskişehir. Retrieved from <https://tez.yok.gov.tr/UlusalTezMerkezi/> (Thesis no: 395176)
- Sarıçoban, A., Tosuncuoğlu, İ. & Kırmızı, Ö. (2019). A technological pedagogical content knowledge (TPACK) assessment of pre-service EFL teachers learning

to teach English as a foreign language. *Journal of Language and Linguistic Studies*, 15(3), 1122-1138. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1230244.pdf>

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education*, 42(2), 123-149. <https://doi.org/10.1080/15391523.2009.10782544>

Schmid, M., Brianza, E., & Petko, D. (2020). Developing a short assessment instrument for Technological Pedagogical Content Knowledge (TPACK. xs) and comparing the factor structure of an integrative and a transformative model. *Computers & Education*, 157. 1-12. <https://doi.org/10.1016/j.compedu.2020.103967>

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational researcher*, 15(2), 4-14. <https://doi.org/10.3102/0013189X015002004>

Spector, J. M., Merrill, M. D., Elen, J., & Bishop, M. J. (Eds.). (2014). *Handbook of research on educational communications and technology* (4th ed.). New York, NY: Springer. <https://doi.org/10.1007/978-1-4614-3185-5>

Stern, B. E. (1991). Technology Education as a Component of Fundamental Education: A National Perspective. In M. Hacker, A. Gordon, & M. de Vries (Eds.), *Integrating Advanced Technology into Technology Education* (vol. 78, pp. 73-89). Springer. https://link.springer.com/chapter/10.1007/978-3-642-76768-5_6

T.C. Millî Eğitim Bakanlığı. (n.d.). Retrieved January 01, 2022, from <https://www.meb.gov.tr/en/>

Tondeur, J., Van de Velde, S., Vermeersch, H., & Van Houtte, M. (2016). Gender Differences in the ICT Profile of University Students: A Quantitative

- Analysis. *DiGeSt. Journal of Diversity and Gender Studies*, 3(1), 57-77.
<https://doi.org/10.11116/jdivgendstud.3.1.0057>
- Tondeur, J., Scherer, R., Baran, E., Siddiq, F., Valtonen, T., & Sointu, E. (2019). Teacher educators as gatekeepers: Preparing the next generation of teachers for technology integration in education. *British Journal of Educational Technology*, 50(3), 1189-1209. <https://doi.org/10.1111/bjet.12748>
- Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2020). Enhancing pre-service teachers' technological pedagogical content knowledge (TPACK): A mixed-method study. *Educational Technology Research and Development*, 68(1), 319-343. <https://doi.org/10.1007/s11423-019-09692-1>
- Turgut, Y. (2017a). A comparison of pre-service, in-service and formation program for teachers' perceptions of technological pedagogical content knowledge (TPACK) in English language teaching (ELT). *Educational Research and Reviews*, 12(22), 1091-1106. <https://doi.org/10.5897/ERR2017.3311>
- Turgut, Y. (2017b). An Analysis of TPACK Integration into English Language Teacher Education Programs: A Comparative Study of Turkey and Denmark. *i-manager's Journal on English Language Teaching*, 7(4), 1-15. <https://doi.org/10.26634/jelt.7.4.13763>
- Voogt, J., Erstad, O., Dede, C., & Mishra, P. (2013). Challenges to learning and schooling in the digital networked world of the 21st century. *Journal of Computer Assisted Learning*, 29(5), 403-413. <https://doi.org/10.1111/jcal.12029>
- Vrasidas, C., & McIsaac, M. S. (2001). Integrating Technology in Teaching and Teacher Education: Implications for Policy and Curriculum Reform. *Educational Media International*, 38(2-3), 127-132. <https://doi.org/10.1080/09523980110041944>
- Wulansari, D., Adlim, M., & Syukri, M. (2020, February). Technological pedagogical and content knowledge (TPACK) of science teachers in a suburban area. *Journal*

of Physics: Conference Series, 1460(1), 1-6. <https://doi.org/10.1088/1742-6596/1460/1/012135>

Yildirim, A. & Simsek, H. (2005). *Qualitative research methods* (5th ed.). Ankara: Seckin.

Yurdakul, I. K. (2018). Modeling the relationship between pre-service teachers' TPACK and digital nativity. *Educational Technology Research and Development*, 66(2), 267-281. <https://doi.org/10.1007/s11423-017-9546-x>

Zengin, Ö. & Aksu, M. (2017). A Review Study on the Integration of Technology into Foreign Language Education in Turkey. *Ankara University Journal of Faculty of Educational Sciences (JFES)*, 50 (2), 79-104. https://doi.org/10.1501/Egifak_0000001398



APPENDICES

APPENDIX 1

Approval from MAKU Research Ethics Committee



ARAŞTIRMA PROJESİ DEĞERLENDİRME RAPORU

Toplantı Tarihi: 06.04.2022 Çarşamba

Toplantı No:2022/04

Karar No: GO 2022/589

Üniversitemiz Eğitim Bilimleri Enstitüsü Yabancı Diller Eğitimi Anabilim Dalı İngiliz Dili Eğitimi Yüksek Lisans öğrencisi Fatih Mehmet YİĞİT' in Doç. Dr. Ali KARAKAŞ danışmanlığında yürüteceği *“Yükseköğretim Düzeyindeki İngilizce Sınıflarında Görev Yapan Öğretim Görevlilerinin Teknolojik Pedagojik İçerik Bilgisine (TPAB) Yönelik Algılarının Araştırılması”* başlıklı proje önerisi araştırmanın gerekçe, amaç, yaklaşım ve yöntemleri dikkate alınarak incelenmiş olup, çalışmanın fikri, hukuki ve telif hakları bakımından sorumluluğu araştırma ekibine ait olması koşulu ile etik açıdan uygun bulunmuştur.

APPENDIX 2

Informed Consent Form for the Research Study

	BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU
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Sayın Katılımcı, katıldığınız bu çalışma bilimsel nitelikte bir araştırma olup konusu “Yükseköğretim düzeyindeki İngilizce sınıflarında görev yapan öğretim görevlilerinin teknolojik pedagojik içerik bilgisine (TPAB) yönelik algılarının araştırılması” dır. Bu araştırma, Burdur Mehmet Akif Ersoy Üniversitesi Eğitim Bilimleri Enstitüsü İngiliz Dili Eğitimi Anabilim Dalı’nda yürütülmekte olunan araştırmacı Fatih Mehmet YİĞİT’in yüksek lisans araştırma ödevi kapsamında yapılmaktadır.

Bilgisayar ve öğretim teknolojilerindeki hızlı gelişmeler, yirmi birinci yüzyılda eğitimin doğasını değiştirmiş ve eğitim kurumlarını yeni teknolojilerin ortaya çıkışına uygun olarak kendilerini yenilemeye zorlamıştır. Yeni teknolojinin ortaya çıkması, bir sınıfı neyin oluşturduğuna, bir öğretmenin rolüne ve öğretmen bilgisinin niteliklerine ilişkin geleneksel anlayışların da doğal olarak değişmesine zemin hazırlamıştır. Eğitimde etkili teknoloji entegrasyonu düşünüldüğünde, bunun sadece uygun teknolojik araçlara değil, aynı zamanda bu teknolojik araçların öğretmenler tarafından kullanılmasına da bağlı olduğu söylenebilir. Teknoloji ile iyi öğretim anlayışı temel olarak içerik, pedagoji ve teknoloji arasındaki ve arasındaki etkileşime dayanmakta olup bu durum Teknolojik Pedagojik Alan Bilgisi (TPAB) çerçevesi olarak adlandırılan bir karışımı ifade etmektedir (Koehler ve diğerler, 2013). Yapılacak bu çalışma, Türkiye’de yükseköğretim düzeyindeki bir devlet üniversitesinde yabancı dil sınıflarında görev yapan öğretim görevlilerinin Teknolojik Pedagojik Alan Bilgisi (TPAB) yönelik algılarını araştırmayı amaçlamaktadır. Araştırma için **en az 30** öğretim görevlisinin çalışmaya katılması beklenmektedir. Araştırmada sıralı açıklayıcı karma yöntem araştırma deseni kullanılacak olup bu kapsamda katılımcılardan öncelikle bilgisayar ortamında hazırlanmış TPAB anketini yapmaları ve sonrasında gönüllü katılımcılarla odak grup mülakatı yapılması hedeflenmektedir.

Bu çalışmaya katılmak **gönüllülük** esasına dayanmaktadır. Çalışmaya katılmama ve çalışmanın herhangi bir aşamasında, hiçbir cezaya/yaptırıma maruz kalmaksızın, çalışmadan ayrılma hakkına sahipsiniz. Araştırmada yer almanız nedeniyle size hiçbir ödeme yapılmayacak ve sizden de hiçbir ücret talep edilmeyecektir. Anketi yanıtlamanız, araştırmaya **katılım için onam verdiğiniz** anlamına gelmektedir. Araştırma hakkında daha fazla bilgi almak için araştırmacı **Fatih Mehmet Yiğit**’e başvurabilir, araştırmacıya **günün 24 saatinde 05055307887** numaralı cep telefonundan erişebilirsiniz.



BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU

Araştırmanın bilgilendirilmiş gönüllü olur formundaki tüm açıklamaları okudum/sözlü olarak dinledim. Bana yukarıda konusu ve amacı belirtilen araştırma ile ilgili yazılı ve sözlü açıklama aşağıda belirtilen araştırmacı tarafından yapıldı. Araştırmaya gönüllü olarak katıldığımı istediğim zaman gerekçeli veya gerekçesiz olarak araştırmadan ayrılabilceğimi biliyorum. Söz konusu araştırmaya, hiçbir baskı ve zorlama olmaksızın kendi rızamla katılmayı kabul ediyorum.

Gönüllünün Adı-Soyadı

İmzası

Tarih

Araştırma hakkındaki yukarıdaki ve istenen diğer bilgiler katılımcıya tarafımdan açıklanmış ve yazılı onamını alınmıştır.

Araştırmacının (Adı-Soyadı)

İmzası

Tarih

Fatih Mehmet YİĞİT

APPENDIX 3

Permission to Use the EFL-TPACK Questionnaire

permission to use your questionnaire 

 **FATİH MEHMET YİĞİT** 20 Aralık Pzt 15:16 (5 gün önce)   

Alici: Mehmet ▾

Dear colleague,

I am currently doing an MA in ELT program at Burdur Mehmet Akif Ersoy University. For the partial fulfillment of Language Teacher Education course, I intend to conduct a research study in order to investigate the perceptions of in-service instructors towards the use of technological pedagogical content knowledge (TPACK) in tertiary-level EFL classrooms.

I wonder if it is possible to make some adaptations to the questionnaire in your Master's thesis and make use of it in my research study?

I look forward to hearing from you soon.

Kind regards,



Lecturer of English
TOEFL IBT/TOEIC TCA & Proctor

School of Foreign Languages
Ali Osman Sönmez Campus
Uludağ University

 **Mehmet Saraç** 20 Aralık Pzt 15:20 (5 gün önce)   

Alici: ben ▾

Dear Colleague,

It is really an important aspect these days and I am glad that you want to make use of my data collection tool.

I am really interested in your research idea, and I will be waiting to be informed about the findings of your research.

Kind Regards

APPENDIX 4

Permission from BUUSFL to Apply the EFL-TPACK Questionnaire



T.C.
BURSA ULUDAĞ ÜNİVERSİTESİ
Yabancı Diller Yüksekokulu Müdürlüğü

Sayı: E-83504669-000-1115
Konu: Anket Uygulama İzini

29.12.2021

Sn. Öğr. Gör. Fatih Mehmet YİĞİT

Burdur Mehmet Akif Ersoy Üniversitesi Eğitim Bilimleri Enstitüsü Yabancı Diller Anabilim dalı İngiliz Dili Öğretimi Bilim Dalında yaptığınız Yüksek Lisans eğitiminizde, "Yükseköğretim düzeyindeki İngilizce sınıflarında görev yapan öğretim görevlilerinin teknolojik pedagojik içerik bilgisine (TPAB) yönelik algılarının araştırılması" adlı çalışmanızın anketini Yüksekokulumuz öğretim görevlilerine uygulama talebiniz Müdürlüğümüzce uygun görülmüştür.
Bilgilerinizi ve gereğini arz ederim.

Prof. Dr. İsmail GÜLER
Müdür

Ek:
Dilekçe&Anket Örneği

Bu belge, güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Kodu: qKUj9ewlG0211reCoJM5wg

Belge Doğrulama Adresi: <https://udos.uludag.edu.tr/Teyit/>

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Bilgi için: Feyza HIÇDURMAZ

Şef

Telefon No: 61016-61017



Bu belge UDOS ile hazırlanmıştır.

APPENDIX 5

EFL-TPACK Questionnaire for Instructors

Dear colleagues,

I am currently enrolled in MA ELT program at Burdur Mehmet Akif Ersoy University. The aim of my research study is to investigate the perceptions of in-service instructors towards technological pedagogical content knowledge (TPACK) in tertiary-level EFL classrooms.

The questionnaire will be the first phase of my research study. Focus group interviews will be the second phase in order to get an insider view during data collection. Your patient and sincere responses are significant as they will affect the reliability and validity of the study. Be sure that all the personal data provided from questionnaires and interviews will be kept strictly confidential in my reports.

If you have any questions, please do not hesitate to contact me or my thesis advisor, Assoc. Prof. Dr. Ali Karakaş.

Thank you in advance for your help and cooperation.

Fatih Mehmet Yiğit
School of Foreign Languages
Uludağ University, Bursa

Assoc. Prof. Dr. Ali Karakaş
MA ELT
Mehmet Akif Ersoy University, Burdur

* The questionnaire is adapted from: Saraç, M. (2015). An explanatory investigation on the Turkish EFL teachers' TPACK and their attitudes toward the use of interactive whiteboards (Master's thesis) (pp. 116-123). Eskişehir: Institute of Educational Sciences, Anadolu University.

Consent Form

I have read the above information. I hereby give my consent for the data acquired to be used by Fatih Mehmet Yiğit in this survey.

☐ Yes

Section I: General Information

1. Your age: 20-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 41-45 ☐ 46- Above ☐

2. Gender: Male ☐ Female ☐

3. Are you a graduate of;

English Language Teaching ☐ Linguistics ☐ Translation and Interpretation ☐

English Language and Literature ☐ American Language and Literature ☐

Other _____

4. Do you have Masters or PhD Degree?

No ☐ M.A ☐ PhD ☐

5. Years of teaching experience:

1-5 years ☐ 6-10 years ☐ 11-15 years ☐ 16-20 years ☐ 21- above ☐

6. Years of experience with:

a) online learning management systems (Google Classroom, Macmillan, Oxford, etc.)

None ☐ 1-2 years ☐ More than 2 years ☐

b) online teaching tools (Zoom, Google Meet, Microsoft Teams, etc.)

None ☐ 1-2 years ☐ More than 2 years ☐

7. How many hours do you teach online English classes in a week?

1-2 hours a week ☐ 3-5 hours a week ☐ 6-10 hours a week ☐

11 or more hours ☐

8. Please indicate the answer that best show your opinion about the sentence below.

"I feel myself competent enough in terms of teaching online."

Strongly disagree ☐ Disagree ☐ No idea ☐ Agree ☐ Strongly agree ☐

9. Have you received any training about online LMS and/or teaching tools before? If yes, please specify.

Yes ☐ _____

No ☐

10. Would you like to attend a follow-up focus group interview?

Yes ☐

No ☐

Section II: Technological Pedagogical Content Knowledge (EFL-TPACK)

Questionnaire

For the following items, please circle the answers that best show your opinion.

1= Strongly disagree 2= Disagree 3= No idea 4= Agree 5= Strongly agree

	Technology Knowledge					
1	I know how to save data into/from a digital device (i.e., flash disk, USB stick, CD).	1	2	3	4	5
2	I know how to play audio and video files on my computer.	1	2	3	4	5
3	I know how to use computer mediated communication (CMC) technologies (e.g., email, chat).	1	2	3	4	5
4	I know how to record video files (i.e., using a video camera).	1	2	3	4	5
5	I know how to create images on my computer (i.e., using Windows Paint).	1	2	3	4	5
6	I know how to record audio files (i.e., using a dictaphone).	1	2	3	4	5
7	I know about basic computer hardware (i.e., CD-ROM, mother-board, RAM) and their functions.	1	2	3	4	5
8	I know how to use generic office applications (i.e., Word, PowerPoint, Excel).	1	2	3	4	5
9	I know how to edit images on my computer (i.e., using Photoshop).	1	2	3	4	5
10	I know how to use electronic / online dictionaries.	1	2	3	4	5
11	I know how to use web 2.0 technologies (e.g., blogs, social networks, and wikis).	1	2	3	4	5
	Content Knowledge					
1	I can monitor my own writing for accuracy.	1	2	3	4	5
2	I can comprehend English speech accurately.	1	2	3	4	5
3	I can monitor my own speech for accuracy.	1	2	3	4	5
4	I can comprehend English texts accurately.	1	2	3	4	5
5	I am familiar with the culture(s) of target language communities.	1	2	3	4	5
6	I am familiar with the differences between spoken and written English.	1	2	3	4	5
	Pedagogical Content Knowledge					
1	I can assess student learning in multiple ways.	1	2	3	4	5
2	I can select teaching materials appropriate to the needs of learners.	1	2	3	4	5
3	I can choose an appropriate approach to teach learners (i.e., Communicative approach, Direct Method).	1	2	3	4	5
4	I can adapt my teaching style to different learners.	1	2	3	4	5
5	I can facilitate learning through individual, partner, group, and whole class activities.	1	2	3	4	5
6	I can plan when and how to use the target language, including meta-language I may need in the classroom.	1	2	3	4	5
7	I can keep students on task.	1	2	3	4	5
8	I can identify linguistic problems experienced by learners (i.e., phonological, lexical or grammatical problems).	1	2	3	4	5
9	I can design language courses around the requirements of the curriculum.	1	2	3	4	5

10	I can facilitate learning by creating a comfortable environment in which learners are willing to take risks.	1	2	3	4	5
11	I can react supportively to learners' interaction.	1	2	3	4	5
12	I am aware of the contextual factors that could inhibit/promote English teaching.	1	2	3	4	5
Technological Content Knowledge						
1	I know about technologies that I can use to teach English language grammar.	1	2	3	4	5
2	I know about technologies that I can use to teach reading in English.	1	2	3	4	5
3	I know about technologies that I can use to teach writing in English.	1	2	3	4	5
4	I know about technologies that I can use to teach English vocabulary.	1	2	3	4	5
5	I know about technologies that I can use to teach pronunciation of English words.	1	2	3	4	5
6	I know about technologies that I can use to teach listening in English.	1	2	3	4	5
7	I know about technologies that I can use to teach about the differences between cultures.	1	2	3	4	5
Technological Pedagogical Knowledge						
1	I can adapt the use of the technologies that I am learning about to different teaching activities.	1	2	3	4	5
2	I can choose technologies that enhance students' learning for a lesson.	1	2	3	4	5
3	I can choose technologies that enhance the teaching approaches for a lesson.	1	2	3	4	5
4	I can design, using technology, relevant learning experiences to promote student learning.	1	2	3	4	5
5	I think critically about how to use technology in my classroom.	1	2	3	4	5
6	I can engage students in solving authentic problems using digital technologies and resources.	1	2	3	4	5
7	I can choose technologies to be used in assessment.	1	2	3	4	5
Technological Pedagogical Content Knowledge						
1	I can use a range of technologies that enable students to become active participants.	1	2	3	4	5
2	I can use a range of technologies to help students pursue their individual curiosities.	1	2	3	4	5
3	I can use technology effectively to communicate relevant information to students and peers.	1	2	3	4	5
4	I can facilitate intercultural understanding by using technology to engage students with different cultures.	1	2	3	4	5
5	I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn.	1	2	3	4	5
6	I can provide equitable access to digital language learning tools and resources.	1	2	3	4	5
7	I can teach lessons that appropriately combine English linguistic concepts, technologies, and teaching approaches.	1	2	3	4	5

APPENDIX 6

Semi-structured Interview Questions for Instructors (English version)

First of all, thank you for taking the time to meet with me and join the interview. Our interview will be recorded. The ethics committee approval and institutional permissions were obtained for the relevant study. Data gathered from your participation in this study will not be used out of academic purposes, and your names will be kept confidential during reporting. It consists of five questions and is divided into four parts. In the first part, I will begin by requesting an overall evaluation from you. Next, we will delve into the challenges you face. Followingly, we will elaborate on your needs together. In the last part, we will finish our interview by welcoming your suggestions. If you have any questions before we begin, I would be happy to answer them now. If not, we can begin our interview.

1. How do you evaluate yourself regarding the use of technology in your lessons?
2. How do you evaluate the effect of techno-pedagogical content knowledge (TPACK) on using educational technologies in your English as a Foreign Language (EFL) courses?
3. When using educational technologies in your lessons, what are
 - a. self-related challenges?
 - b. student-related challenges?
 - c. institution-related challenges?
 - d. other:
4. Have you received any training on the effective use of educational technologies and techno-pedagogical content knowledge in your classes?
 - a. If yes,
 - i. what training have you received?
 - ii. how do you evaluate the reflection of these trainings on the teaching practices of English as a foreign language?
 - b. If no, what are your needs in terms of effective use of educational technologies and techno-pedagogical content knowledge in your courses?
5. What are your suggestions for the effective use of educational technologies and the development of techno-pedagogical content knowledge in your courses?

Upon your request, the findings of this research will be shared with you.

Thank you for attending the interview.

APPENDIX 7

Öğretim Görevlileri için Mülakat Soruları (Türkçe versiyonu)

Öncelikle bana zaman ayırdığınız ve mülakata katılmak istediğiniz için teşekkür ederim. Mülakatımız kayıt altına alınacaktır. İlgili çalışma için gerekli etik kurulu onayı ve kurumsal izinler alınmıştır. Bu çalışmaya katılmanızdan elde edilecek veriler akademik amaçlar dışında kesinlikle kullanılmayacak ve raporlanması esnasında isimleriniz saklı tutulacaktır. Mülakatımız beş sorudan oluşmakta olup dört bölüme ayrılmaktadır. İlk kısımda sizlerden genel bir değerlendirme alarak başlayacağım. Devamında karşılaştığınız zorluklar hakkında ayrıntılı konuşacağız. Bunu müteakiben ihtiyaçlarınız hususunu beraber detaylandıracağız. Son kısımda da sizlerin önerilerinizi alarak mülakatımızı bitireceğiz. Başlamadan önce herhangi bir sorunuz varsa cevaplayabilirim. Yoksa mülakatımıza başlayabiliriz.

1. Derslerinizde teknoloji kullanımı bakımından kendinizi nasıl değerlendiriyorsunuz?
2. Tekno-pedagojik alan bilgisinin (TPAB) yabancı dil olarak İngilizce derslerinizde eğitim teknolojilerini kullanmaya etkisini nasıl değerlendiriyorsunuz?
3. Derslerinizde eğitim teknolojilerini kullanmada karşılaştığınız
 - a. kendinizden kaynaklı güçlükler nelerdir?
 - b. öğrencilerden kaynaklı güçlükler nelerdir?
 - c. kurum kaynaklı güçlükler nelerdir?
 - d. diğer:
4. Derslerinizde eğitim teknolojilerinin etkin kullanımı ve tekno-pedagojik alan bilgisi ile ilgili herhangi bir eğitim aldınız mı?
 - a. Evet ise,
 - i. hangi eğitimleri aldınız?
 - ii. bu eğitimlerin yabancı dil olarak İngilizcenin öğretimi uygulamalarına yansımaları nasıl değerlendiriyorsunuz?

- b. Hayır ise, derslerinizde eğitim teknolojilerinin etkin kullanımı ve tekno-pedagojik alan bilgisi bakımından ihtiyaçlarınız nelerdir?
5. Derslerinizde eğitim teknolojilerinin etkin kullanımı ve tekno-pedagojik alan bilgisinin geliştirilmesi konusunda önerileriniz nelerdir?

Talep etmeniz halinde araştırmanın bulguları sizinle paylaşılacaktır.

Mülakata katıldığınız için teşekkür ederim.



APPENDIX 8

CURRICULUM VITAE

PERSONAL INFORMATION

Name Surname: Fatih Mehmet Yiğit

EDUCATIONAL BACKGROUND

Master's Degree: Burdur Mehmet Akif Ersoy University

Institute of Educational Sciences, Department of Foreign Language Education

Master's Program with Thesis in English Language Teaching (2024)

Bachelor's Degree: Hacettepe University

Faculty of Education, Department of Foreign Languages Education

Program of English Language Teaching (2008)

WORK EXPERIENCE

Uludağ University, School of Foreign Languages

English Language Instructor (2009-present)

REFEREED CONGRESS / SYMPOSIUM PUBLICATIONS IN PROCEEDINGS

Yiğit, F. M., (2016). Reflective Practice in Classroom Interaction: A Case Study of Two EFL Classrooms at Social Sciences Vocational College in Uludağ University. In *Proceedings of the XI. European Conference on Social and Behavioral Sciences* (p. 377). International Association of Social Science Research (IASSR). Rome, Italy.

Yiğit, F. M., & Çakıcı, Y., (2022). A Systematic Review of Previous Studies regarding the Perceptions of English Teachers and Students about World Englishes. In *Proceedings of the 6. Uluslararası Başöğretmen Eğitim ve Yenilikçi Bilimler Kongresi* (p. 127). Burdur, Türkiye.

